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Coping with Cancer Pain: A Qualitative Study to Recognize Pain Perception and Self-Coping Strategies of Cancer Patients, Sri Lanka

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Coping with Cancer Pain: A Qualitative Study to Recognize Pain Perception and Self-Coping Strategies of Cancer Patients, Sri Lanka

Abstract

Pain is one of the most debilitating symptoms of cancer, substantially diminishing one's quality of life. The level of pain experienced is eventually determined by the pain coping strategies adopted by patients individually. The awareness of the 'self-coping methods of pain' of individual patients would be beneficial for the multidisciplinary pain team to consider such methods when planning future interventions to manage pain.

Objectives: This study explores the pain perception and coping strategies used by patients with cancer pain in Sri Lanka.

Design: A descriptive qualitative study

Setting: Pain management unit, Apeksha Hospital, Maharagama, Sri Lanka.

Participants: The study was conducted among purposively selected patients with cancer and registered at the pain management unit. Twenty-one semi-structured interviews were conducted until data saturation.

Data were analyzed by Graneheim and Lundman's content analysis method. Ethical clearance was obtained from relevant authorities.

Results: Most participants were in the 51 to 60-year age category and Sinhalese Buddhists. The study's findings revealed two sub-themes under 'pain perception', namely 'unbearable pain experience' and 'cultural context in the description of pain' and five sub-themes under 'coping strategies', namely 'self-control', 'spiritual support', 'finding support', 'use of alternative treatment methods' and 'lifestyle adjustments'.

Conclusion: Coping strategies were adopted especially in achieving essential life aspirations and participating in preferred activities. Goals or activities were often adjusted to fall within their health limits. Acceptance and progress in life were considered more important than pain control. We recommend giving due consideration to 'self-coping strategies' of individual patients in designing interventions to mitigate cancer pain.

Keywords: cancer pain; coping strategies; pain perception; qualitative study; Sri Lanka

Data availability statement

Data are available upon reasonable request.

Article Summary

Strengths and limitations of this study

- The study's qualitative approach and in-depth exploration of cancer patient's pain perception and coping strategies, providing a nuanced understanding of patients' experiences.
- The inclusion of a diverse range of cancer patients ensures variability in experiences and contributes to a more comprehensive understanding of the coping strategies across various contexts.
- The study's methodological rigor includes interviewing until theoretical saturation, having the same investigator conduct all interviews, and addressing potential translation issues to improve data reliability and credibility.
- The study is limited to the cultural context of Sri Lanka, and the findings may not be readily applicable to other cultural contexts.

1. Introduction

Pain is the most common symptom and is complex in nature, experienced at some point in the cancer journey. Cancer treatments or the tumour itself can directly or indirectly cause cancer pain (Caraceni & Shkodra., 2019). Pain is the most distressing and intolerable symptom for cancer patients, and its intensity increases as the disease progresses (Akin et al., 2013). Cancer patients with longstanding pain experience the worst quality of life as a result of a decreased function increased emotional distress, and increased depressive symptoms, which keep them caught in a vicious cycle (Green et al., 2013). In order to predict how well the pain interventions would work, it is crucial to consider one's beliefs about pain, how the pain is perceived, and the methods already adopted in coping with pain. Unrealistic or unfavourable thoughts about pain can lead to increased pain (Tuck & Wilson et al., 2010), emotional distress, decreased daily activity, decreased functional outcome, decreased length of stay, and increased medication dependence. When a disease cannot be cured, patients may still benefit from pain interventions to enhance their quality of life (Wells & McCaffery., 2008).

Studies have shown that personal experience with pain and individual coping strategies impact/ influence the adaptation to pain (Noyman-Veksleret al., 2017). A person experiencing persistent pain will likely acquire coping skills to help them manage or lessen their pain. Some coping and adaptive strategies employed by people with chronic pain might not be the most advantageous from a psychological or physical perspective (Litt, & Tennen., 2015). In fact, some pain-relieving techniques used can make-the pain worse (Noyman-Veksleret al., 2017). As a result, it's critical to understand how patients react to and cope with pain.

Coping techniques are based on cognitive, emotional, and behavioral responses to overcome (health) threats. Coping skills may positively impact treatment outcomes and survival rates of cancer patients (Guariglia et al., 2021). Furthermore, the advanced disease affects the physical and psychological well-being of patients with resultant poor quality of life along with mental instability. Coping strategies based on behavioral and psychological mechanisms help people deal with their 'stress' and to live a relatively stress-free and quality life. Therefore, supporting and encouraging adaptive pain coping skills can help cancer patients, even in advanced and incurable stages of their disease (Greer et al., 2018). Currently, coping support is included in interventions for patients with advanced cancer (Von Heymann-Horan et al., 2018; Walshe et al., 2017). Further, the interventions can also be tailored to fit in with the self-coping strategies adopted.

Primary coping mechanisms are 'problem' and 'emotion' focused. Problem-oriented tactics consist of acts that reduce or alter stressful circumstances. Emotion-focused techniques aim to regulate the emotional effects of stress and achieve affective and emotional equilibrium (Carver et al., 1989; Carver et al., 1993).

Spirituality was defined as the degree to which a person has or seeks a purpose or meaning in life, as feelings of connection to a higher force, and as a source of hope in the face of hardship. Prayer has been shown to improve pain tolerance and help people think about pain in new and different ways (Ferreira-Valente et al., 2019). Many individuals discover that aspects of their spirituality assist them in coping with their pain. According to research, spiritual beliefs can reduce the effect of pain-related stressors, improve pain tolerance, and reduce pain intensity (Ferreira-Valente et al., 2019). It is critical that providers comprehend how the patient deal with pain holistically. Spirituality and religiosity are two distinct but apparently related concepts that play an important role in the subject of pain perception and coping. Spirituality has been identified as an adaptive coping technique (Forti, Serbena & Scaduto., 2020) and a predictor of improved quality of life in cancer patients (Ferreira et al., 2020). They are, in fact, interdependent (Thiengo et al., 2019), but the religiosity component is institutional, based on beliefs and rituals, and is directly related to a level of involvement or adherence to religious practices (Inoue & Vecina., 2017). On the other hand, the spiritual component is a broader psycho-sociological construct (Lemos., 2019), with a more individual and subjective character, unfinished and molded by life experiences.

Since pain is a unique and subjective experience, using structured quantitative data to investigate pain perception and coping techniques in cancer patients is insufficient. Given the varying cultural, religious and economic context of Sri Lankan society, (Chen et al., 2008), descriptive research is necessary to enhance and deepen comprehension of pain perception and coping techniques among Sri Lankan cancer patients. This could assist in determining how best pain coping methods among cancer patients in Sri Lanka can be supported. The present study was conducted in the absence of sufficient information and scientific literature on the 'pain perception' and 'self-copying techniques' of cancer patients in Sri Lanka.

2. Materials and Methods

2.1 Study design

A qualitative descriptive study was undertaken using a phenomenological approach to explore the individual coping strategies of patients suffering from cancer pain in Sri Lanka. This study takes a constructivist approach, recognizing the subjective aspect of cancer patients' pain experiences and aiming to understand the many interpretations given to these experiences by people.

2.2 Study setting and participants

Patients aged 18 and older with cancer-related pain and pain scores of 3 or higher on a Numerical Rating Scale (NRS) who visited the Pain Management Unit of premier cancer hospital in Sri Lanka, Apeksha Hospital, Maharagama. were recruited. Sinhala-speaking patients who gave informed written consent to participate in the study were included. Patients with pain of non-cancerous origin, mental illness, or brain metastases were excluded. The purposeful sample included patients of different ages, sexes, educational levels, cancer types, and treatments. The principal investigator (PI) conducted 21 semi-structured interviews until data saturation.

2.3 Study instruments

The semi-structured interview guide was developed. The topics and question areas for the guide were determined through an extensive literature review and refined by subject experts. The guide was pre-tested on five patients with cancer pain. This found complex probing questions and determined if the interviewer guide got the required range of responses. The interview time and transcribing issues were addressed. Following the pre-test, the guide was updated.

2.4 Data collection

The principal investigator, a qualified nurse, and an experienced qualitative researcher conducted semi-structured interviews with 21 participants until theoretical data saturation was achieved using an interview guide between December 2018 and April 2019. The interviewer introduced herself and explained the interview's objective. The informant was guaranteed that the information would be kept confidential and that their identity would never be disclosed in any written documentation. It was emphasized that he/she had the freedom to speak any opinion without fear of condemnation. The word 'cancer' or any synonym with a comparable meaning was deliberately avoided to reduce distress for the informant. The term 'the sickness treated at this hospital' was employed instead. The informant admitted that clinical professionals would only be informed when necessary. Consent from the informant was requested in such instances. Prior to the interview, each participant provided informed written consent, which included permission to record the interview.

The interviews took place in a quiet room at the pain clinic or in a separate area in the hospital to ensure participants' comfort and privacy. Nonverbal indicators were observed. The interviewer displayed openness and impartiality throughout the session. Finally, the interviewer concluded the discussion and evaluated the respondent's credibility. The interviews ranged from 30 to 60 minutes in duration.

2.5 Data analysis

Qualitative data were processed using Granehiem and Lundman's content analysis (Graneheim & Lundman., 2004) methods. Data collection and analysis were done simultaneously. Multiple transcripts were reviewed to establish meaning categories and codes. After studying the data, basic codes were generated. Transcripts were coded and categorized. Labeling applicable beginning codes established subcategories and groupings. The text's latent meaning and key themes were refined until researchers agreed on them. After comparing codes and themes, the final themes emerged.

2.6 Trustworthiness

The data's reliability was assessed using Guba and Lincoln's guidelines (Guba & Lincoln., 1981). Internal validity was confirmed instantly. During data collection, the PI developed solid relationships with participants. Two cancer pain patients who did not participate in the study agreed that the codes accurately characterized their experiences (member check). External qualitative research experts approved the units of meaning, codes, subcategories, categories, and themes and provided comments that were incorporated into the final analysis. The chosen interviews, codes, and categories were also shared with two non-study cancer pain patients, both of whom agreed that the codes accurately described their experiences.

2.7 Ethical considerations

Ethical approval was granted for this study by the relevant authorities. All patients provided written informed consent prior to enrolment in the study.

3. Results

The majority of the participants (n=21) were Sinhala Buddhists between the ages of 51 and 60. There were 12 (57.1%) females and 16 (76.2%) married people. The majority of participants earned less than LKR 5,000 per month and had attended Grades 6-11. Among the participants, 57% reported experiencing pain for three months or longer, and 52% had cancer for less than one year. The demographic characteristics of the study participants are shown in Supplementary Table 1.

Two major themes (pain perception, and coping strategies for living with pain) and 7 subthemes emerged from the interviews, which are summarized in Table 1.

Table 1: Themes and subthemes emerged in cancer patients with pain (n=21)

Themes	**Sub-themes**
pain perception	unbearable pain experience
	cultural context in the description of pain
coping strategies for living with pain	self-control
	finding spiritual support
	Finding personnel support
	using alternative treatment methods
	lifestyle adjustments

3.1 Pain perception

This theme includes two subthemes: "unbearable pain experience" and "cultural context in the description of pain." The severity of pain in advanced cancer patients ranged from mild to severe. Most people described their pain as unpleasant and distressing, with negative physical and emotional consequences. Participants' reactions to their pain arose. The intensity of the pain made participants feel helpless and hopeless, and many believed cancer and pain were synonymous. The supplementary Table:2 shows the meaning units, codes, and categories under theme 1: Perception and spiritual beliefs of pain.

3.1.1 Unbearable pain experience:

Participants reported excruciating pain. It was their primary concern. Significant cancer pain was deemed to be difficult to bear. Some have tried to commit suicide as a result of unbearable pain. Some argue that it is better to die than to endure this pain. Some claim that having cancer is tolerable yet painless.

> *"When the pain is unbearable, I think living is also a problem. I still wonder why I live. So, when the pain comes, it is so difficult." (P-05)*
>
> *"It is so hard ... not to let this kind of pain happen again... not even to an enemy…." (P-15)*
>
> *"I cannot bear this pain anymore…." (P-05)*

3.1.2 The cultural context in the description of pain:

Patients tried to find the cause of their disease, although they felt uncertain about it. However, some patients thought that cancer and pain were their destiny. Buddhist people tend to believe that this pain is due to the sins they have committed in their previous births.

> *"These are sins of previous births. More than this, the thieves attacked even Arahat Mugalan thero* [one of the Buddha's closest disciples] *because of previous sins... Nobody can stop this... We have to face them." (P-08)*
>
> *"When the pain rises, I am thinking is this a 'karma'* [how a person's deeds in this and prior realms of existence affect their fate in subsequent existences] *which I had done in a previous birth. Otherwise, according to my knowledge, I have not made any misdeeds in this birth". (Participant -07)*

3.2 Coping strategies to living with pain

Individuals were motivated to achieve important life aspirations and participate in preferred activities. Frequently, goals or activities were altered to meet their current state of health. The majority believed that acceptance and progress in life were more important than indulging in complete pain control. Therefore, they used to practice several self-coping strategies to live with pain. The meaning units, codes, and categories under Theme 2: Coping strategies to living with pain are shown in Supplementary Table 3.

3.2.1 Self-control:

Many participants used pain medication given by the clinic regularly, and some reported good efficacy and believe that is the best way to control pain. Many have practiced some distraction methods that may be unique to themselves to achieve pain relief.

> *"I used to go to a shop nearby my home and used to have a chat with the shop owner when the next medication time is due... Otherwise, I go for a walk with my kitten and puppy... it helps me with pain relief." (Participant -19)*
>
> *"I always try to do something in my garden... Otherwise, talk with somebody. If I stay alone or do nothing, the pain is high. So. I always try to pay attention to whatever the thing. However, I cannot do things like reading a book. I cannot be seated at a place for some time." (Participant -18)*
>
> *I do not let others know that I am in pain because my mom is scared. [Her mother is 80 years old and bedridden]... So, I bear upon tight somehow. When the pain is unbearable only, ~~that~~ I shout." (Participant -10)*

3.2.2 Find spiritual support:

Most of the informants considered that religious activities gave relief. They tried to be more religious and spiritual. Most of the Buddhist informants started understanding the teachings of Buddhist philosophy. Most of the informants tried to make up their minds with religious teachings. With the uncertainty of recovery, most of them worried about the future. Many have stated that they tend to do more religious activities after getting this disease and pain, and believed it would give them relief.

> *"I offer flowers, light oil lamps, every morning and evening to Lord Buddha... it gives me happiness. The sight of an oil lamp itself a great relief mentally." (Participant -18)*
>
> *"The only thing I can do now is pray to Jesus to heal me. I am always praying. I pray when I get unbearable pain or sadness. Then I feel a bit at ease." (Participant -20)*
>
> *"The only thing I can beg from God is to make me healthy. Right now, God is the only person there for me to ask whatever.... When I have unbearable pain, grief, or problem, I pray. God will surely heal me. I know I am going to get up again…". (Participant -04)*

3.2.3 Find personnel support:

Patients reported that having assistance from relatives and friends alleviated their emotions of isolation and withdrawal. Most informants were happy about the support extended by family members, relatives, neighbours, and friends at the workplace. Most of the participants were aware of the importance of interpersonal relationships and expressed their appreciation during the interviews. As with any other person, patients with cancer pain value their social network.

> *"It relieves the pain a little bit when talking with somebody. Others tend to look after me after I got this disease... People in my workplace too helped me a lot… it is a great relief for me". (Participant -06)*
>
> *"I feel relieved of pain if somebody massages my legs... My younger sister will massage my legs when I am screaming with pain. She is applying hot water and massaging well. Then I feel better..." (Participant -12)*

3.2.4 Lifestyle adjustments:

Participants mentioned 'adjusting' their behaviours to try to prevent pain, such as avoiding tasks that cause pain, but they were also reluctant to allow pain to control their function. Numerous individuals tolerated pain in order to keep their functionality. Many participants had changed their lifestyles in order to find relief from pain. They described these pain-modifying processes as working "with" their pain, including day planning and pain-relieving activities. Certain individuals, particularly those with comorbidities, paced their actions.

> *"I used to do my work slowly when the pain goes off... After taking drugs, little pain relief is there... Then only I can do whatever the household works little by little..." (Participant -11)*
>
> *"I adjusted the time of taking drugs a little bit. I am taking night medication around 11 pm, which are due at 8 pm. Moreover, I used to go to bed around 11 pm. Then I can sleep without pain till morning. Otherwise, I wake up around 2-3 am with pain. After that, I cannot sleep…."*
>
> *"If I were to go somewhere, I used to get the drugs and go or plan the visit to come back before the time of due medication... Otherwise, avoid going anywhere... Most of the time, I used to stay at home because of pain". (Participant -19)*

3.2.5 Alternative treatments:

Patients employed alternative treatment methods to alleviate their pain, such as massage, acupuncture, and other non-pharmacological methods, adjustments to daily life to self-manage cancer pain. Even though the majority of patients received satisfactory pain relief with the pain medications obtained from the clinic, some of the informants wanted to try other traditional or alternative methods to get full recovery from pain and illness.

> *"I took 'Sinhala beheth'* {conventional treatment method} *from 'vedamahaththaya',* {the person who is practicing conventional treatment method} *and not only these drugs. I went*

everywhere... They gave oil to apply... it works... When I get pain, I ask my son to apply some oil… then the pain subsides". (Participant -15)

"I did 'yantra mantra adurukam" {a type of custom practiced by ancestors believing to have some power of curing} to get relief. They gave 'kashaya' {a type of beverage given by Ayurvedic treatment method}. However, I did not get complete relief. If somebody tells me that place is good, I will go there and see." (Participant -09)

4. Discussion

The two major themes suggest how the participants perceived pain and what self-coping strategies practiced to manage pain as far as they can. The majority had experienced moderate to severe pain. Irrespective of religion or race, many participants attempted to interpret the pain perceived in the context of religious/ cultural beliefs. The majority were Buddhists, and they believed that the pain was due to misdeeds done in the previous births. Catholics and Muslims believed that it was the wish of God. Despite their self-confidence to withstand or manage less intense levels of pain, the majority experienced a sense of helplessness at some point in their lives when confronted with episodes of unbearable pain. 'Why me?' is a question that eight of the participants ponder. Similar statements were reported in the literature (Ghahramanian et al., 2016). Some patients see God as their saviour from illness (Elsner et al., 2012), while others believe that God caused their illness as a punishment or a test of faith (Elsner et al., 2012; Hsiao et al.,2011).

In general, patients tried to maintain normalcy by tolerating some degree of pain. Participants had unique coping styles, strategies, and preferences for living with pain. 'Finding support', 'using alternative treatment methods', 'self-control', 'finding spiritual support', and 'lifestyle adjustments' have emerged as sub-themes in this study.

In a study done in Thailand, the most prevalent coping technique among breast cancer survivors was reported as social support (Wonghongkul et al., 2006). A qualitative study conducted among newly diagnosed breast cancer patients in Iran revealed that religious approaches and spiritual fighting, thinking about the disease (positive thinking, hope, intentional forgetfulness; negative thinking: hopelessness, fear), accepting the disease (active and passive acceptance), social and cultural factors, and finding support from others as most prevalent self-coping mechanisms (Taleghani et al., 2006); in which are comparable to our findings.

Bostrom et al. (2004) found that research participants had adapted to pain. Although pain affects activity, it was discovered that activity was a strategy for coping with pain (Boström et al., 2004). Some of the participants mentioned they have used to engage in some work to get pain relief. Chanting Buddhist sutras or listening to Buddhist chanting helped some individuals find inner calm. Xu et al. (2019) discovered the same phenomenon among Chinese participants (Xu et al., 2019). Regardless of religion, most individuals were religious and used their faith to cope with the disease and pain. Cohen et al. (2005) found that elderly Christian Americans, but not Jewish Israelis, emphasize religion's importance and cultural significance in their narratives of coping with cancer pain (Cohen et al., 2005).

Conclusions and recommendations

Cancer pain was perceived as unpleasant, distressing, and impacting negatively on the overall quality of life. The study revealed the self-devised coping strategies used with positive outcomes to obtain relief from cancer pain and associated suffering. Strategies adopted were multidimensional, mostly influenced by the culture, religion, and beliefs of the individuals, and often adjusted within limits of underlying health status and helped to progress in life.

Our findings favour taking individual perceptions of pain and self-coping strategies into account when planning and adopting measures to minimize the impact of cancer pain on the physical and psychosocial well-being of cancer patients. Such an approach may support the individuals to strengthen further the relevant coping strategies in achieving better pain outcomes.

Availability of data and materials

The data utilized to support the findings of this study are available from the corresponding author upon reasonable request.

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Conflicts of Interest

All authors declare that they have no relevant conflicts of interest.

Author contributions

PTRM, AATDA, and CSEG contributed substantially to the work's concept and design, revised the article, and approved the version to be published. NPE conducted the research study, analyzed and interpreted the data, and drafted the article. All authors have read and approved the final manuscript and agreed to be accountable for all aspects of the work.

References

1. Akin Korhan, E., Yildirim, Y., Uyar, M., Eyigör, C., & Uslu, R. (2013). Examination of pain experiences of cancer patients in western Turkey: a phenomenological study. *Holistic nursing practice*, 27(6), 358–365. https://doi.org/10.1097/HNP.0b013e3182a72b76
2. Boström, B., Sandh, M., Lundberg, D., & Fridlund, B. (2004). Cancer-related pain in palliative care: patients' perceptions of pain management. *Journal of advanced nursing*, 45(4), 410-419.
3. Caraceni, A., & Shkodra, M. (2019). Cancer Pain Assessment and Classification. *Cancers*, 11(4), 510. https://doi.org/10.3390/cancers11040510
4. Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, F. L., Jr, & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: a study of women with early-stage breast cancer. *Journal of personality and social psychology*, 65(2), 375–390. https://doi.org/10.1037//0022-3514.65.2.375
5. Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267–283. https://doi.org/10.1037/0022-3514.56.2.267
6. Chen, L. M., Miaskowski, C., Dodd, M., & Pantilat, S. (2008). Concepts within the Chinese culture that influence the cancer pain experience. *Cancer nursing*, 31(2), 103–108. https://doi.org/10.1097/01.NCC.0000305702.07035.4d
7. Cohen, M. Z., Musgrave, C. F., Munsell, M. F., Mendoza, T. R., & Gips, M. (2005). The cancer pain experience of Israeli and American patients 65 years and older. *Journal of pain and symptom management*, 30(3), 254–263. https://doi.org/10.1016/j.jpainsymman.2005.03.011

8. Elsner, F., Schmidt, J., Rajagopal, M. R., Radbruch, L., & Pestinger, M. (2012). Psychosocial and spiritual problems of terminally ill patients in Kerala, India. *Future oncology* (London, England), 8(9), 1183–1191. https://doi.org/10.2217/fon.12.97

9. Ferreira, L. F., de Pinho Freire, A., Silveira, A. L. C., Silva, A. P. M., de Sá, H. C., Souza, I. S., ... & Araujo, L. M. B. (2020). A influência da espiritualidade e da religiosidade na aceitação da doença e no tratamento de pacientes oncológicos: revisão integrativa da literatura. *Revista Brasileira de Cancerologia*, *66*(2). [The Influence of Spirituality and Religiosity on Acceptance of Disease and Treatment of Oncology Patients: Integrative Literature Review] *Revista Brasileira de Cancerologia*, 66(2)doi: 10.32635/2176-9745.rbc.2020v66n2.422.

10. Ferreira-Valente, A., Damião, C., Pais-Ribeiro, J., & Jensen, M. P. (2019). The Role of Spirituality in Pain, Function, and Coping in Individuals with Chronic Pain. *Pain Medicine*, 21(3), 448–457. https://doi.org/10.1093/pm/pnz092

11. Forti, S., Serbena, C. A., & Scaduto, A. A. (2020). Mensuração da espiritualidade/religiosidade em saúde no Brasil: uma revisão sistemática [Spirituality/religiousity measurement and health in Brazil: a systematic review]. *Ciencia & saude coletiva*, 25(4), 1463–1474. https://doi.org/10.1590/1413-81232020254.21672018

12. Ghahramanian, A., Markani, A. K., Davoodi, A., & Bahrami, A. (2016). Spiritual Needs of Patients with Cancer Referred to Alinasab and Shahid Ghazi Tabatabaie Hospitals of Tabriz, Iran. *Asian Pacific journal of cancer prevention* : APJCP, 17(7), 3105–3109.

13. Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, 24(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001

14. Green, C. R., Hart-Johnson, T., & Loeffler, D. R. (2011). Cancer-related chronic pain: examining quality of life in diverse cancer survivors. *Cancer,* 117(9), 1994–2003. https://doi.org/10.1002/cncr.25761

15. Greer, J. A., Jacobs, J. M., El-Jawahri, A., Nipp, R. D., Gallagher, E. R., Pirl, W. F., Park, E. R., Muzikansky, A., Jacobsen, J. C., Jackson, V. A., & Temel, J. S. (2018). Role of Patient Coping Strategies in Understanding the Effects of Early Palliative Care on Quality of Life and Mood. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 36(1), 53–60. https://doi.org/10.1200/JCO.2017.73.7221

16. Guariglia, L., Ieraci, S., Villani, V., Tanzilli, A., Benincasa, D., Sperati, F., Terrenato, I., & Pace, A. (2021). Coping Style in Glioma Patients and Their Caregiver: Evaluation During Disease Trajectory. *Frontiers in Neurology*, 12, 709132. https://doi.org/10.3389/fneur.2021.709132

17. Guba EG, Lincoln YS. (1981). *Effective Evaluation*. 1st ed. Jossey-Bass Publishers; San Francisco

18. Hsiao, S. M., Gau, M. L., Ingleton, C., Ryan, T., & Shih, F. J. (2011). An exploration of spiritual needs of Taiwanese patients with advanced cancer during the therapeutic processes. *Journal of clinical nursing*, 20(7-8), 950–959. https://doi.org/10.1111/j.1365-2702.2010.03278.x

19. Inoue, T. M., & Vecina, M. V. A. (2017). Spirituality and/or religiosity and health: a literature review. *Journal of the Health Sciences Institute*, 35, 127-130.

20. Lemos, C. T. (2019). Espiritualidade, religiosidade e saúde: uma análise literária.[Spirituality, Religiosity and Health: A Literary Analysis] *Revista Caminhos-Revista de Ciências da Religião*, *17*(2), 688-708.

21. Litt, M. D., & Tennen, H. (2015). What are the most effective coping strategies for managing chronic pain?. *Pain management*, 5(6), 403–406. https://doi.org/10.2217/pmt.15.45

22. Noyman-Veksler, G., Lerman, S. F., Joiner, T. E., Brill, S., Rudich, Z., Shalev, H., & Shahar, G. (2017). Role of Pain-Based Catastrophizing in Pain, Disability, Distress, and Suicidal Ideation. *Psychiatry*, 80(2), 155–170. https://doi.org/10.1080/00332747.2016.1230984

23. Taleghani, F., Yekta, Z. P., & Nasrabadi, A. N. (2006). Coping with breast cancer in newly diagnosed Iranian women. *Journal of advanced nursing*, 54(3), 265–273. https://doi.org/10.1111/j.1365-2648.2006.03808_1.x

24. Thiengo, P. C. D. S., Gomes, A. M. T., Das Mercês, M. C. C., Couto, P. L. S., França, L. C. M., & Da Silva, A. N. (2019). Espiritualidade E Religiosidade No Cuidado Em Saúde: Revisão Integrativa. [Spirituality and religiosity in health care: An integrative review.] *Cogitare Enfermagem,* 24. https://doi.org/10.5380/ce.v24i0.58692

25. Turk, D. C., & Wilson, H. D. (2010). Fear of Pain as a Prognostic Factor in Chronic Pain: Conceptual Models, Assessment, and Treatment Implications. *Current Pain and Headache Reports*, 14(2), 88–95. https://doi.org/10.1007/s11916-010-0094-x

26. Von Heymann-Horan, A. B., Puggaard, L. B., Nissen, K. G., Benthien, K. S., Bidstrup, P., Coyne, J., Johansen, C., Kjellberg, J., Nordly, M., Sjogren, P., Timm, H., Von der Maase, H., & Guldin, M-B. (2018). Dyadic psychological intervention for patients with cancer and caregivers in home-based specialized palliative care: The Domus model.

Palliative & supportive care, 16(2), 189-197. https://doi.org/10.1017/S1478951517000141

27. Walshe, C., Roberts, D., Appleton, L., Calman, L., Large, P., Lloyd-Williams, M., & Grande, G. (2017). Coping Well with Advanced Cancer: A Serial Qualitative Interview Study with Patients and Family Carers. *PloS one*, 12(1), e0169071. https://doi.org/10.1371/journal.pone.0169071

28. Wells N, Pasero C, McCaffery M. (2008). Improving the Quality of Care Through Pain Assessment and Management. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD): Agency for Healthcare Research and Quality (US); Chapter 17. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2658/

29. Wonghongkul, T., Dechaprom, N., Phumivichuvate, L., & Losawatkul, S. (2006). Uncertainty appraisal coping and quality of life in breast cancer survivors. *Cancer nursing*, 29(3), 250–257. https://doi.org/10.1097/00002820-200605000-00014

30. Xu, X., Cheng, Q., Ou, M., Li, S., Xie, C., & Chen, Y. (2019). Pain acceptance in cancer patients with chronic pain in Hunan, China: A qualitative study. *International Journal of Nursing Sciences*, 6(4), 385–391. https://doi.org/10.1016/j.ijnss.2019.09.011

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

Page/line no(s).

Title and abstract

Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pg 1 line 1,2
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pg 1

Introduction

Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Page 3 Line 46-104
Purpose or research question - Purpose of the study and specific objectives or questions	line 103-104

Methods

Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	line 108-112
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	title page page 6 line 129
Context - Setting/site and salient contextual factors; rationale**	Pge 5 Line 115-116
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Page 4-5 Line 118-120
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Page 4-5 line 165-166 129-145
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	page 5-6 line 129-145

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Page 6 Line 123-127
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Page 8 Line 168-173
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Page 7 Line 148-154
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Page 7 Line 148-154
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Page 7 Line 156-163

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Page 8-13 Line 168-283
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Page 8-13 Line 168-283

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Page 13-14 Line 285-316
Limitations - Trustworthiness and limitations of findings	

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Page 20
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	title Page

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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Coping with Cancer Pain: A Qualitative Study to Recognize Pain Perception and Self-Coping Strategies of Cancer Patients, Sri Lanka

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Coping with Cancer Pain: A Qualitative Study to Recognize Pain Perception and Self-Coping Strategies of Cancer Patients, Sri Lanka

Edirisinghe NP[1,2], Makuloluwa PTR[3], Amarasekara AATD[4] , Goonewardena CSE[5,6]
[1] Department of Fundamental Nursing, Faculty of Nursing, University of Colombo, Sri Lanka niroshae@fnd.cmb.ac.lk
[2] Faculty of Graduates Studies, University of Sri Jayewardenepura, Sri Lanka,
[3]Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka, makuloluwaptr@kdu.ac.lk
[4]Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka, thamara@sjp.ac.lk
[5]Department of Community Medicine, Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, sampatha@sjp.ac.lk
[6]Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

Corresponding Author: Dr. Nirosha Priyadarshani Edirisinghe, keenirosha@yahoo.com, niroshae@fnd.cmb.ac.lk , +94718435907
Postal Address: 1B2, Kolamadiriya, Bandaragama, Sri Lanka

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Ethical approval was granted for this study by the Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17).

Authors' contributions

PTRM, AATDA, and CSEG contributed substantially to the work's concept and design, analysis revised the article, and approved the version to be published. NPE carried out the research study, analyzed and interpreted the data, and drafted the article. All authors have read and approved the final manuscript.

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Conflicts of Interest

All authors declare that they have no relevant conflicts of interest.

Consent:

Informed written consent was obtained from study participants before starting interviews.

Coping with Cancer Pain: A Qualitative Study to Recognize Pain Perception and Self-Coping Strategies of Cancer Patients, Sri Lanka

Abstract

Pain is one of the most debilitating symptoms of cancer, substantially diminishing one's quality of life. The level of pain experienced is eventually determined by the pain coping strategies adopted by patients individually. The awareness of the ‘self-coping methods of pain’ of individual patients would be beneficial for the multidisciplinary pain team to consider such methods when planning future interventions to manage pain.

Objectives: This study explores the pain perception and coping strategies used by patients with cancer pain in Sri Lanka.

Design: A descriptive qualitative study.

Setting: Pain management unit, Apeksha Hospital, Maharagama, Sri Lanka.

Participants: The study was conducted among purposively selected patients with cancer and registered at the pain management unit. Twenty-one semi-structured interviews were conducted until data saturation.

Data were analyzed by Graneheim and Lundman's content analysis method. Ethical clearance was obtained Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17).

Results: Most participants were in the 51 to 60-year age category and Sinhalese Buddhists. The study's findings revealed two sub-themes under ‘Understanding pain’, namely ‘Physical and emotional impact’ and ‘Cultural and spiritual interpretations’, and five sub-themes under ‘Coping strategies for living with pain’, namely ‘Medication and self-control’, ‘Seeking spiritual support’, ‘Receiving social support’, ‘Exploring alternative treatments’ and ‘Adapting daily life’.

Conclusion: Coping strategies were adopted especially in achieving essential life aspirations and participating in preferred activities. Goals or activities were often adjusted to fall within their health limits. Acceptance and progress in life were considered more important than pain control. We recommend giving due consideration to the ‘self-coping strategies’ of individual patients in designing interventions to mitigate cancer pain.

Keywords: cancer pain; coping strategies; pain perception; qualitative study; Sri Lanka

Data availability statement

Data are available upon reasonable request.

Article Summary

Strengths and limitations of this study

- The study's qualitative approach and in-depth exploration of cancer patient's pain perception and coping strategies, provide a nuanced understanding of patients' experiences.
- The inclusion of a diverse range of cancer patients ensures variability in experiences and contributes to a more comprehensive understanding of the coping strategies across various contexts.
- The study's methodological rigor includes interviewing until theoretical saturation, having the same investigator conduct all interviews, and addressing potential translation issues to improve data reliability and credibility.
- The study is limited to the cultural context of Sri Lanka, and the findings may not be readily applicable to other cultural contexts.

1. Introduction

Pain is the most common and complex symptom experienced at various points in the cancer journey, both pre-and post-treatment. Cancer treatments or the tumor itself can directly or indirectly cause cancer pain.[1] Pain is the most distressing and intolerable symptom for cancer patients, and its intensity increases as the disease progresses.[2] Cancer patients with longstanding pain experience significantly worse quality of life compared to those with less persistent pain. This deterioration is due to decreased function, increased emotional distress, and heightened depressive symptoms, creating a vicious cycle that further impacts their well-being.[3]

Quality of life in this context refers to the overall well-being encompassing physical health, emotional state, level of independence, social relationships, personal beliefs, and their relationship to salient features of the environment. Predicting the effectiveness of pain interventions requires understanding patients' beliefs about pain, their perception of pain, and their current coping strategies. Unrealistic or negative thoughts about pain can exacerbate the pain experience, emotional distress, decreased daily activity, decreased functional outcome, decreased length of stay, and increased medication dependence.[4] When a disease cannot be cured, patients may still benefit from pain interventions to enhance their quality of life.[5]

Studies have shown that personal experiences with pain and individual coping strategies significantly influence how patients adapt to pain.[6] Research indicates that individuals experiencing persistent pain are very likely to develop coping skills to help manage their pain. For example, a study by Turk and Monarch (2002) found that a high percentage of chronic pain patients report using various coping strategies to deal with their pain.[7] However, it is important to note that not all coping and adaptive strategies employed by people with chronic pain are beneficial from a psychological or physical perspective.[8] Some pain-relieving techniques can exacerbate pain.[6] Therefore, it is critical to understand how patients react to and cope with pain. While coping skills may not necessarily reduce the pain itself, they can significantly modify the impact of pain, helping patients manage the emotional and psychological stress associated with chronic pain. Coping strategies are based on cognitive, emotional, and behavioral responses to overcome health threats. Coping skills may positively impact treatment outcomes and survival rates of cancer patients.[9] Furthermore, advanced disease can significantly affect the physical and psychological well-being of patients, often resulting in a reduced quality of life and increased emotional distress. Although it is not inevitable that advanced disease leads to mental instability, patients may experience heightened anxiety, depression, or psychological distress.[10] Coping strategies based on behavioural and psychological mechanisms help people manage their stress and improve their quality of life. Therefore, supporting and encouraging adaptive pain coping skills can benefit cancer patients, even in the advanced and incurable stages of their disease.[11] Currently, coping support is included in interventions for patients with advanced cancer.[12,13] These interventions can also be tailored to align with patients' self-coping strategies.

Primary coping mechanisms are ‘problem’ and ‘emotion’ focused. Problem-oriented tactics consist of acts that reduce or alter stressful circumstances. Emotion-focused strategies aim to regulate the emotional effects of stress and achieve affective and emotional equilibrium.[14,15] It is important to note that coping support is not limited to patients with advanced cancer. In many healthcare systems, including those in developed countries, coping support is available at various stages of the cancer journey, from pre-diagnosis to post-treatment.[12,13] However, the availability and extent of these services can vary widely depending on the healthcare infrastructure and resources of a given country.

Meegoda et al. conducted a descriptive cross-sectional study in Sri Lanka among 124 patients with cancer, and the majority (68%) reported pain relief as the most common reason for their readmissions.[16] In Sri Lanka, where this study is based, coping support may be more prominently featured in interventions for patients with advanced cancer due to resource limitations. Supporting and encouraging adaptive pain coping skills can benefit cancer patients, even in advanced and incurable stages of their disease.[11] These interventions can also be tailored to align with patients' self-coping strategies. Since pain is a unique and subjective experience, using structured quantitative data to investigate pain perception and coping strategies in cancer patients is insufficient. Given the varying cultural, religious, and economic contexts of Sri Lankan society, descriptive research is necessary to enhance and deepen comprehension of pain perception and coping strategies, among Sri Lankan cancer patients.[17] This could assist in determining how best pain coping methods among cancer patients in Sri Lanka can be supported. The present study was conducted in the absence of sufficient information and scientific literature on the ‘pain perception’ and ‘self-coping strategies’ of cancer patients in Sri Lanka.

2. Materials and Methods

2.1 Study design

A qualitative descriptive study was undertaken to explore the individual coping strategies of patients suffering from cancer pain in Sri Lanka. This study takes a constructivist approach, recognizing the subjective aspect of cancer patients' pain experiences and aiming to understand the many interpretations given to these experiences by people.

2.2 Study setting and participants

The study employed purposive sampling to ensure a diverse and representative sample of cancer patients experiencing pain who visited the Pain Management Unit of the premier cancer hospital in Sri Lanka, Apeksha Hospital, Maharagama. The inclusion criteria were carefully selected to identify participants who could provide rich, relevant data on coping strategies. Specifically, patients aged 18 and older with cancer-related pain and pain scores of 3 or higher on a Numerical Rating Scale (NRS) were recruited. NRS was a 0-10 scale, where 0 represented "no pain" and 10 represented "worst possible pain." This criterion ensured that all participants were experiencing significant pain, making their coping strategies particularly pertinent to the research objectives. Purposive sampling was implemented to capture a wide range of experiences and perspectives. The principal investigator intentionally selected participants varying in age, sex, educational level, cancer type, and treatment stage. This approach ensured that the sample reflected the heterogeneity of the broader population of cancer patients.

Patients were required to be Sinhala-speaking and to provide informed written consent, ensuring they could fully understand the study's purpose and consent process. Exclusion criteria included patients with pain of non-cancerous origin, mental illness, or brain metastases, as these conditions could introduce confounding variables that might obscure the specific coping strategies related to cancer pain.

At the recruitment process, patients meeting the inclusion criteria were identified from the Pain Management Unit at Apeksha Hospital. Among those who consented, the principal investigator selected participants to ensure a diverse sample. This selection considered demographic and clinical characteristics to ensure a broad representation of experiences. In this study, theoretical saturation was achieved when the semi-structured interviews with 21 participants yielded no new themes or significant variations in the data.

2.3 Study instruments

The semi-structured interview guide was developed (Supplementary file-1) through an extensive literature review and refinement by subject experts. The guide was pre-tested on five patients with cancer pain to ensure its effectiveness. During this pre-testing, it was found that some probing questions were too complex for participants to answer easily, necessitating rewording for clarity and simplicity. Additionally, the pre-test aimed to determine whether the interview questions elicited responses that broadly covered the topic areas of interest. The goal was not to find "right" or "wrong" answers but to ensure that the questions were effective in capturing the full range of participants' experiences and perspectives on the topics being studied. The pre-test also identified issues related to interview duration and transcription. Based on the feedback from this pre-testing, the interview guide was updated to simplify complex questions, ensure comprehensive coverage of relevant topics, and address logistical issues related to interview time and transcription.

2.4 Data collection

The principal investigator, who is both a qualified nurse and an experienced qualitative researcher, conducted semi-structured interviews with 21 participants using an interview guide between December 2018 and April 2019, until theoretical data saturation was achieved. Data saturation is a concept in qualitative research that refers to the point at which no new information or themes are observed in the data.[18] This means that additional interviews no longer contribute to new insights or variations in the themes being studied. In this study, data saturation was determined when no further topics arose in the interviews, and no new themes were generated by the data. Given that interviews and data analysis were conducted concurrently, data saturation was identified through ongoing analysis. The research team continuously reviewed and coded the interview transcripts, and once it was observed that subsequent interviews were not producing new themes or significant new information, data saturation was considered achieved.

The interviewer introduced herself and explained the interview's objective with an information sheet and given time to consider before giving informed consent. The informant was guaranteed that the information would be kept confidential and that their identity would never be disclosed in any written documentation. It was emphasized that he/she had the freedom to speak any opinion without fear of condemnation. The word 'cancer' or any synonym with a comparable meaning was deliberately avoided to reduce distress for the informant. The term 'the sickness treated at this hospital' was employed instead. The informant admitted that clinical professionals would only be informed when necessary. Consent from the informant was requested in such instances. Prior to the interview, each participant provided informed written consent, which included permission to record the interview. The interviews took place in a quiet room at the pain clinic or in a separate area in the hospital to ensure participants' comfort and privacy.

During the interviews, nonverbal indicators were observed to gain a deeper understanding of the participants' experiences and emotions. Nonverbal cues, such as facial expressions, body language, and gestures, can provide valuable insights into a participant's feelings and attitudes that may not be fully captured through verbal responses alone. Observing these indicators helped the interviewer to interpret the emotional context of the responses and to probe further when necessary.

Notes on nonverbal indicators were taken during the interviews and were later used in the data analysis process to complement and enhance the understanding of the verbal data. The interviewer endeavored to remain open and impartial throughout the interviews, meaning she consciously maintained a neutral stance, actively listened without expressing personal opinions or judgments, and allowed participants to share their experiences and perspectives freely. The interviews ranged from 30 to 60 minutes in duration.

2.5 Data analysis

Qualitative data were processed using Granehiem and Lundman's content analysis methods.[19] The data collection and analysis were conducted simultaneously to allow for continuous refinement of the research process and identification of emerging themes. All interviews were audio-recorded and then transcribed verbatim. The transcriptions were checked against the audio recordings for accuracy and completeness. The transcripts were read multiple times by the principal investigator to become thoroughly familiar with the data and to identify initial impressions. Each transcript was reviewed immediately after transcription to identify meaningful units of text. These units of meaning, such as phrases, sentences, or paragraphs relevant to the research questions, were highlighted and assigned initial codes. The initial codes were grouped into categories based on similarities and patterns identified in the data. This involved organizing codes into broader categories that reflected the key aspects of the data. As new interviews were conducted, the ongoing analysis allowed for the integration of new data with existing categories and codes. This iterative process helped in refining the categories and identifying any new themes that emerged. After coding several transcripts, the codes were reviewed and integrated into the data set as a whole. This step involved comparing and merging codes across all transcripts to ensure consistency and comprehensiveness. Within each category, subcategories were developed to further organize the data into more specific themes. This step helped in understanding the nuances and variations within each category. The categories and subcategories were analyzed to identify overarching themes. These themes represented the latent meanings and central ideas that emerged from the data. The themes were interpreted and refined through discussion among the researchers until a consensus was reached.

2.6 Trustworthiness

The data's reliability was assessed using Guba and Lincoln's guidelines.[20] To achieve credibility, the following steps were incorporated into the process; the principal investigator

(PI) spent significant time in the field, developing strong relationships with participants, which helped build trust and obtain rich, in-depth data; two cancer pain patients who did not participate in the study reviewed the codes and themes to ensure they accurately represented their experiences; the use of multiple sources of data (interviews with diverse participants) and multiple researchers in the coding process helped to verify the findings and reduce bias; further external qualitative research experts reviewed the units of meaning, codes, subcategories, categories, and themes, and provided feedback that was incorporated into the final analysis. Transferability was achieved through the selection of a purposeful diverse sample of participants with a wide range of experiences, enhancing the potential for the findings to be applicable to other similar settings.

The dependability of the study was achieved through maintaining detailed records of the research process, including data collection and analysis procedures, were maintained which allows others to follow the research steps and verify the study's findings. Further, multiple transcripts were reviewed and coded by the PI, and the codes were compared and refined to ensure consistency and reliability in the coding process. External qualitative research experts reviewed the research process and findings, providing an additional layer of scrutiny to ensure reliability.

The PI maintained a reflexive journal to document personal reflections, potential biases, and decisions made throughout the research process, and field notes helped to ensure that the findings were grounded in the data rather than influenced by the researcher's preconceptions and achieved confirmability of the study.

2.7 Ethical considerations

Ethical approval was granted for this study by the Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17). All patients provided written informed consent prior to enrolment in the study.

2.8 Patient and Public Involvement

None

3. Results

The majority of the participants (n=21) were Sinhala Buddhists between the ages of 51 and 60. There were 12 (57.1%) females and 16 (76.2%) married people. The majority of participants earned less than LKR 5,000 per month and had attended Grades 6-11. Among the participants, 57% reported experiencing pain for three months or longer, and 52% had cancer for less than one year. The demographic characteristics of the study participants are shown in Supplementary Table 1.

This theme encompasses participants' descriptions of their pain experiences and the cultural and spiritual contexts influencing their perceptions. It includes two subthemes: "Physical and Emotional Impact" and "Cultural and Spiritual Interpretations." as summarized in Table 1.

Table 1: Themes and subthemes emerged in cancer patients with pain (n=21)

Themes	Sub-themes
Understanding pain	Physical and emotional impact
	Cultural and spiritual interpretations
coping strategies for living with pain	Medication and self-control
	Seeking spiritual support
	Receiving social support
	Adapting daily life
	Exploring alternative treatments lifestyle

3.1 Understanding Pain

This theme encompasses participants' descriptions of their pain experiences and the cultural and spiritual contexts influencing their perceptions. It includes two subthemes: "Physical and emotional impact" and "Cultural and spiritual interpretations. The severity of pain in cancer patients ranged from mild to severe. Most people described their pain as unpleasant and distressing, with negative physical and emotional consequences. Participants expressed various reactions to their pain. The intensity of the pain made participants feel helpless and hopeless, and many believed cancer and pain were synonymous. The supplementary Table: 2 shows the meaning units, codes, and categories under theme 1: Understanding pain.

Physical and emotional impact

Participants reported excruciating pain. It was their primary concern. Significant cancer pain was deemed to be difficult to bear. Some have tried to commit suicide as a result of unbearable pain. Some argue that it is better to die than to endure this pain. Some claim that having cancer is tolerable yet painless.

> *"When the pain is unbearable, I think living is also a problem. I still wonder why I live. So, when the pain comes, it is so difficult."*
>
> *"It is so hard ... not to let this kind of pain happen again... not even to an enemy…."*
>
> *"I cannot bear this pain anymore…."*

Cultural and spiritual interpretations

The cultural and spiritual beliefs of participants influenced their perceptions of pain. Patients tried to find the cause of their disease, although they felt uncertain about it. However, some patients thought that cancer and pain were their destiny. Buddhist people tend to believe that this pain is due to the sins they have committed in their previous births. While some doubt about 'why this has happened to me'?

> *"These are sins of previous births. More than this, the thieves attacked even Arahat Mugalan thero* [one of the Buddha's closest disciples] *because of previous sins... Nobody can stop this... We have to face them."*

> *"When the pain rises, I am thinking is this a 'karma'* [how a person's deeds in this and prior realms of existence affect their fate in subsequent existences] *which I had done in a previous birth. Otherwise, according to my knowledge, I have not made any misdeeds in this birth".*

> *"I have not done any misdeeds in this birth according to my knowledge… why this has happened to me?"*

3.2 Coping strategies for living with pain

Individuals were motivated to achieve important life aspirations and participate in preferred activities. Frequently, goals or activities were altered to meet their current state of health. The majority believed that acceptance and progress in life were more important than indulging in complete pain control. Therefore, they used to practice several self-coping strategies to live with pain. This theme includes five subthemes: "Medication and self-control," "Seeking spiritual support," "Receiving social support," "Adapting daily life," and "Exploring alternative treatments. "The meaning units, codes, and categories under Theme 2: Coping strategies for living with pain are shown in Supplementary Table 3.

3.2.1 Medication and self-control

Many participants used pain medication given by the clinic regularly, and some reported good efficacy and believed that it was the best way to control pain. Many have practiced some distraction methods that may be unique to themselves to achieve pain relief.

> *"I used to go to a shop nearby my home and used to have a chat with the shop owner when the next medication time is due... Otherwise, I go for a walk with my kitten and puppy... it helps me with pain relief."*

"I always try to do something in my garden... Otherwise, talk to somebody. If I stay alone or do nothing, the pain is high. So. I always try to pay attention to whatever the thing. However, I cannot do things like reading a book. I cannot be seated at a place for some time."

I do not let others know that I am in pain because my mom is scared. [Her mother is 80 years old and bedridden]… So, I bear upon tight somehow. When the pain is unbearable only, I shout."

3.2.2 Seeking spiritual support

Religious and spiritual activities provided comfort and relief for many participants. They tried to be more religious and spiritual. Most of the Buddhist informants started understanding the teachings of Buddhist philosophy. Most of the informants tried to make up their minds with religious teachings. With the uncertainty of recovery, most of them worried about the future. Many have stated that they tend to do more religious activities after getting this disease and pain and believed it would give them relief.

"I offer flowers, light oil lamps, every morning and evening to Lord Buddha... it gives me happiness. The sight of an oil lamp itself is a great relief mentally."

"The only thing I can do now is pray to Jesus to heal me. I am always praying. I pray when I get unbearable pain or sadness. Then I feel a bit at ease."

"The only thing I can beg from God is to make me healthy. Right now, God is the only person there for me to ask whatever…. When I have unbearable pain, grief, or problem, I pray. God will surely heal me. I know I am going to get up again…".

3.2.3 Receiving social support

Patients reported that having assistance from relatives and friends alleviated their emotions of isolation and withdrawal. Most informants were happy about the support extended by family members, relatives, neighbors, and friends at the workplace. Most of the participants were aware of the importance of interpersonal relationships and expressed their appreciation during the interviews. As with any other person, patients with cancer pain value their social network.

> *"It relieves the pain a little bit when talking with somebody. Others tend to look after me after I got this disease... People in my workplace too helped me a lot… it is a great relief for me".*
>
> *"I feel relieved of pain if somebody massages my legs... My younger sister will massage my legs when I am screaming with pain. She is applying hot water and massaging well. Then I feel better..."*

3.2.4 Adapting daily life

Participants mentioned 'adjusting' their behaviors to try to prevent pain, such as avoiding tasks that cause pain, but they were also reluctant to allow pain to control their function. Numerous individuals tolerate pain to keep their functionality. Many participants had changed their lifestyles to find relief from pain. They described these pain-modifying processes as working "with" their pain, including day planning and pain-relieving activities. Certain individuals, particularly those with comorbidities, paced their actions.

> *"I used to do my work slowly when the pain goes off... After taking drugs, little pain relief is there... Then only I can do whatever the household works little by little..."*
>
> *"I adjusted the time of taking drugs a little bit. I am taking night medication around 11 pm, which is due at 8 pm. Moreover, I used to go to bed around 11 pm. Then I can sleep without pain till morning. Otherwise, I wake up around 2-3 am with pain. After that, I cannot sleep…."*

> *"If I were to go somewhere, I used to get the drugs and go or plan the visit to come back before the time of due medication... Otherwise, avoid going anywhere... Most of the time, I used to stay at home because of pain".*

3.2.5 Exploring alternative treatments

Patients employed alternative treatment methods to alleviate their pain, such as massage, acupuncture, and other non-pharmacological methods, adjustments to daily life to self-manage cancer pain. Even though the majority of patients received satisfactory pain relief with the pain medications obtained from the clinic, some of the informants wanted to try other traditional or alternative methods to get full recovery from pain and illness.

> *"I took 'Sinhala beheth'* {conventional treatment method} *from 'vedamahaththaya',* {the person who is practicing conventional treatment method*} and not only these drugs. I went everywhere... They gave oil to apply... it works... When I get pain, I ask my son to apply some oil... then the pain subsides".*

> *"I did 'yantra mantra adurukam" {a type of custom practiced by ancestors believing to have some power of curing} to get relief. They gave 'kashaya' {a type of beverage given by Ayurvedic treatment method}. However, I did not get complete relief. If somebody tells me that place is good, I will go there and see."*

4. Discussion

The two major themes suggest how the participants perceived pain and what self-coping strategies they practiced managing pain as far as they could. The majority had experienced moderate to severe pain. Irrespective of religion or race, many participants attempted to interpret the pain perceived in the context of religious/ cultural beliefs. The majority were Buddhists, and they believed that the pain was due to misdeeds done in the previous births. Catholics and Muslims believed that it was the wish of God. Despite their self-confidence to withstand or manage less intense levels of pain, the majority experienced a sense of helplessness at some point in their lives when confronted with episodes of unbearable pain. 'Why me?' is a question that eight of the participants ponder. Similar statements were reported in the literature.[21] Some patients see God as their savior from illness, while others believe that God caused their illness as a punishment or a test of faith.[22,23]

In general, patients tried to maintain normalcy by tolerating some degree of pain. Participants had unique coping styles, strategies, and preferences for living with pain. ‘Medication and self-control’, ‘Seeking spiritual support’, ‘receiving social support’, ‘adapting daily life’, and ‘Exploring alternative treatments’ have emerged as sub-themes in this study. Meanwhile, they perceived pain under two subthemes; ‘physical and emotional impact’, and ‘cultural and spiritual interpretations’.

In a study done in Thailand, the most prevalent coping strategies among breast cancer survivors were reported as social support.[24] Similarly, a qualitative study conducted among newly diagnosed breast cancer patients in Iran revealed several prevalent self-coping mechanisms. These included religious approaches and spiritual fighting, various thoughts about the disease (positive thinking, hope, intentional forgetfulness; negative thinking: hopelessness, fear), accepting the disease (both active and passive acceptance), and finding support from social and cultural factors.[25] These coping mechanisms are comparable to our findings, highlighting the importance of social support and religious approaches in coping with cancer.

Research has shown that participants adapt to pain and use various activities as coping strategies. Boström et al. (2004) found that engaging in activities helped participants manage their pain. Although pain can limit activity, being active was identified as an effective coping mechanism.[26] For instance, some participants reported that engaging in work or physical activities provided pain relief. Distraction, as a pain management strategy, has been well-documented in the literature. Distraction techniques, such as focusing on activities, can reduce the perception of pain by diverting attention away from the pain itself.[27]

Religious practices, such as chanting Buddhist sutras or listening to Buddhist chants, also served as distraction methods that helped participants find inner calm and cope with their pain. Xu et al. (2019) observed a similar phenomenon among Chinese participants, where religious practices were used to manage pain and provide emotional comfort.[28] The use of faith and religious practices as coping mechanisms is widespread, regardless of specific religious affiliations. This indicates that religious and spiritual practices can serve as powerful tools for distraction and emotional support in pain management.

Several participants reported using alternative treatments such as massage, acupuncture, and traditional medicine alongside their prescribed pain medications. Recent research supports the efficacy of some alternative treatments in managing cancer pain. For example, a systematic review and meta-analysis by Chiu et al. (2017) found that acupuncture is effective in reducing cancer-related pain and improving quality of life.[29] Another study by Miladinia et al., (2016) indicated that massage therapy can significantly alleviate pain and enhance the well-being among cancer patients.[30] Studies suggest that modern medicine combined with conventional treatments can effectively reduce cancer pain intensity and prevalence.[31]

However, while some alternative treatments can be beneficial, their use should be carefully considered and integrated with conventional medical treatments to ensure safety and effectiveness. Patients often turn to alternative treatments due to dissatisfaction with conventional pain management or a desire for more holistic care approaches.[32] Healthcare providers should be aware of these preferences and discuss potential benefits and risks with patients, ensuring an informed and balanced approach to pain management.

In the context of Sri Lanka, traditional medicine and alternative treatments are deeply rooted in cultural practices and beliefs. The use of Ayurvedic treatments, for instance, is common among Sri Lankan cancer patients seeking pain relief.[33] Understanding and respecting these cultural practices can enhance patient-provider communication and support more comprehensive pain management strategies.

In this study, the decision was made to avoid using the term “cancer” during interviews to minimize distress for participants. Instead, phrases like “the sickness treated at this hospital” were used. This decision may have helped participants feel less anxious and more willing to share their thoughts and feelings, potentially leading to richer and more valid data. It demonstrated sensitivity to the emotional state of participants, fostering trust and openness. On the other hand, avoiding the term “cancer” could have affected the specificity and depth of the responses. Participants might have provided more general answers, potentially missing out on more direct and nuanced discussions about their cancer-related pain and experiences. This could impact the study's ability to fully capture the complexities of coping with cancer pain.

Concurrent data collection and analysis allowed iterative refinement of the interview guide, early identification of themes, and increased flexibility in adapting the study based on emerging data, while it has some limitations; time and resource intensive, risk of bias influencing subsequent interviews, complexity in managing and integrating data.

Despite the strengths of this study, we wish to acknowledge several methodological limitations. The qualitative approach, while suitable for exploring individual experiences, involves subjective interpretation that can introduce bias. The sample, drawn from a single institution (Apeksha Hospital, Sri Lanka), may limit the generalizability of the findings. Despite efforts to include a diverse range of participants, the results may not represent all cancer patients experiencing pain in different settings or cultural contexts. The use of semi-structured interviews depends on the interviewer's skills and neutrality, potentially introducing interviewer bias. Although pre-testing of the interview guide aimed to mitigate this, some nuances of participants' experiences may have been overlooked. Data saturation was deemed reached after 21 interviews, but additional interviews might have uncovered new themes. The subjective nature of the coding and categorization process, despite the use of member checks and external expert reviews, can influence the analysis. In this study, the PI endeavored to remain open and impartial throughout the data collection and analysis phases. However, the development of solid relationships with participants, while beneficial for gaining trust and richer data, may have introduced potential biases. These limitations provide context for interpreting the findings and highlight the need for further research to confirm and expand upon the insights gained from this study. Future research could benefit from incorporating multiple sites and employing mixed methods.

Conclusions and recommendations

Cancer pain was perceived as unpleasant, distressing, and impacting negatively on the overall quality of life. The study revealed the self-devised coping strategies used with positive outcomes to obtain relief from cancer pain and associated suffering. Strategies adopted were multidimensional, mostly influenced by the culture, religion, and beliefs of the individuals, and often adjusted within limits of underlying health status and helped to progress in life.

Our findings favour taking individual perceptions of pain and self-coping strategies into account when planning and adopting measures to minimize the impact of cancer pain on the physical and psychosocial well-being of cancer patients. More research is needed to understand the effectiveness and integration of alternative treatments in managing cancer pain, especially within the cultural context of Sri Lanka. Further, suggest developing and testing integrated care models that combine conventional and alternative treatments, tailored to the cultural and healthcare context of Sri Lanka.

Availability of data and materials

The data utilized to support the findings of this study are available from the corresponding author upon reasonable request.

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Conflicts of Interest

All authors declare that they have no relevant conflicts of interest.

Author contributions

PTRM, AATDA, and CSEG contributed substantially to the work's concept and design, and analysis, revised the article, and approved the version to be published. NPE conducted the research study, analyzed and interpreted the data, and drafted the article. All authors have read and approved the final manuscript and agreed to be accountable for all aspects of the work. The guarantor of the study is NPE.

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Ethical considerations

Ethical approval was granted for this study by the Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17).

References

1. Caraceni, A., & Shkodra, M. (2019). Cancer Pain Assessment and Classification. *Cancers*, 11(4), 510. https://doi.org/10.3390/cancers11040510

2. Akin Korhan, E., Yildirim, Y., Uyar, M., Eyigör, C., & Uslu, R. (2013). Examination of pain experiences of cancer patients in western Turkey: a phenomenological study. *Holistic nursing practice*, 27(6), 358–365. https://doi.org/10.1097/HNP.0b013e3182a72b76
3. Green, C. R., Hart-Johnson, T., & Loeffler, D. R. (2011). Cancer-related chronic pain: examining quality of life in diverse cancer survivors. *Cancer,* 117(9), 1994–2003. https://doi.org/10.1002/cncr.25761
4. Turk, D. C., & Wilson, H. D. (2010). Fear of Pain as a Prognostic Factor in Chronic Pain: Conceptual Models, Assessment, and Treatment Implications. *Current Pain and Headache Reports*, 14(2), 88–95. https://doi.org/10.1007/s11916-010-0094-x
5. Wells N, Pasero C, McCaffery M. (2008). Improving the Quality of Care Through Pain Assessment and Management. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD): Agency for Healthcare Research and Quality (US); Chapter 17. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2658/
6. Noyman-Veksler, G., Lerman, S. F., Joiner, T. E., Brill, S., Rudich, Z., Shalev, H., & Shahar, G. (2017). Role of Pain-Based Catastrophizing in Pain, Disability, Distress, and Suicidal Ideation. *Psychiatry*, 80(2), 155–170. https://doi.org/10.1080/00332747.2016.1230984
7. Turk, D. C., & Monarch, E. S. (2002). Biopsychosocial perspective on chronic pain. In D. C. Turk & R. J. Gatchel (Eds.), Psychological approaches to pain management: A practitioner's handbook (2nd ed., pp. 3–29). The Guilford Press.

8. Litt, M. D., & Tennen, H. (2015). What are the most effective coping strategies for managing chronic pain?. *Pain management*, 5(6), 403–406. https://doi.org/10.2217/pmt.15.45

9. Guariglia, L., Ieraci, S., Villani, V., Tanzilli, A., Benincasa, D., Sperati, F., Terrenato, I., & Pace, A. (2021). Coping Style in Glioma Patients and Their Caregiver: Evaluation During Disease Trajectory. *Frontiers in Neurology*, 12, 709132. https://doi.org/10.3389/fneur.2021.709132

10. Smith, H. R. (2015). Depression in cancer patients: Pathogenesis, implications and treatment (Review). Oncology letters, 9(4), 1509–1514. https://doi.org/10.3892/ol.2015.2944

11. Greer, J. A., Jacobs, J. M., El-Jawahri, A., Nipp, R. D., Gallagher, E. R., Pirl, W. F., Park, E. R., Muzikansky, A., Jacobsen, J. C., Jackson, V. A., & Temel, J. S. (2018). Role of Patient Coping Strategies in Understanding the Effects of Early Palliative Care on Quality of Life and Mood. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 36(1), 53–60. https://doi.org/10.1200/JCO.2017.73.7221

12. Von Heymann-Horan, A. B., Puggaard, L. B., Nissen, K. G., Benthien, K. S., Bidstrup, P., Coyne, J., Johansen, C., Kjellberg, J., Nordly, M., Sjogren, P., Timm, H., Von der Maase, H., & Guldin, M-B. (2018). Dyadic psychological intervention for patients with cancer and caregivers in home-based specialized palliative care: The Domus model. *Palliative & supportive care*, 16(2), 189-197. https://doi.org/10.1017/S1478951517000141

13. Walshe, C., Roberts, D., Appleton, L., Calman, L., Large, P., Lloyd-Williams, M., & Grande, G. (2017). Coping Well with Advanced Cancer: A Serial Qualitative Interview

Study with Patients and Family Carers. *PloS one*, 12(1), e0169071. https://doi.org/10.1371/journal.pone.0169071

14. Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267–283. https://doi.org/10.1037/0022-3514.56.2.267
15. Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, F. L., Jr, & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: a study of women with early-stage breast cancer. *Journal of personality and social psychology*, 65(2), 375–390. https://doi.org/10.1037//0022-3514.65.2.375
16. Meegoda, L., Fernando, S., Sivayogan, S., Atulomah, N. O., & Jayasiri, J. (2015). Perceived palliative care needs of cancer patients, nurses, and domiciliary care providers at a National Cancer Referral Facility, Sri-Lanka.
17. Chen, L. M., Miaskowski, C., Dodd, M., & Pantilat, S. (2008). Concepts within the Chinese culture that influence the cancer pain experience. *Cancer nursing*, 31(2), 103–108. https://doi.org/10.1097/01.NCC.0000305702.07035.4d
18. Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18(1), 59–82. https://doi.org/10.1177/1525822X05279903
19. Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, 24(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001
20. Guba EG, Lincoln YS. (1981*). Effective Evaluation*. 1st ed. Jossey-Bass Publishers; San Francisco

21. Ghahramanian, A., Markani, A. K., Davoodi, A., & Bahrami, A. (2016). Spiritual Needs of Patients with Cancer Referred to Alinasab and Shahid Ghazi Tabatabaie Hospitals of Tabriz, Iran. *Asian Pacific journal of cancer prevention* : APJCP, 17(7), 3105–3109.

22. Elsner, F., Schmidt, J., Rajagopal, M. R., Radbruch, L., & Pestinger, M. (2012). Psychosocial and spiritual problems of terminally ill patients in Kerala, India. *Future oncology* (London, England), 8(9), 1183–1191. https://doi.org/10.2217/fon.12.97

23. Hsiao, S. M., Gau, M. L., Ingleton, C., Ryan, T., & Shih, F. J. (2011). An exploration of spiritual needs of Taiwanese patients with advanced cancer during the therapeutic processes. *Journal of clinical nursing*, 20(7-8), 950–959. https://doi.org/10.1111/j.1365-2702.2010.03278.x

24. Wonghongkul, T., Dechaprom, N., Phumivichuvate, L., & Losawatkul, S. (2006). Uncertainty appraisal coping and quality of life in breast cancer survivors. *Cancer nursing*, 29(3), 250–257. https://doi.org/10.1097/00002820-200605000-00014

25. Taleghani, F., Yekta, Z. P., & Nasrabadi, A. N. (2006). Coping with breast cancer in newly diagnosed Iranian women. *Journal of advanced nursing*, 54(3), 265–273. https://doi.org/10.1111/j.1365-2648.2006.03808_1.x

26. Boström, B., Sandh, M., Lundberg, D., & Fridlund, B. (2004). Cancer-related pain in palliative care: patients' perceptions of pain management. *Journal of advanced nursing*, 45(4), 410-419.

27. Eccleston, C., & Crombez, G. (1999). Pain demands attention: a cognitive-affective model of the interruptive function of pain. Psychological bulletin, 125(3), 356–366. https://doi.org/10.1037/0033-2909.125.3.356Chiu, H. Y., Hsieh, Y. J., & Tsai, P. S. (2017). Systematic review and meta-analysis of acupuncture to reduce cancer-related

pain. European journal of cancer care, 26(2), 10.1111/ecc.12457. https://doi.org/10.1111/ecc.12457

28. Xu, X., Cheng, Q., Ou, M., Li, S., Xie, C., & Chen, Y. (2019). Pain acceptance in cancer patients with chronic pain in Hunan, China: A qualitative study. *International Journal of Nursing Sciences*, 6(4), 385–391. https://doi.org/10.1016/j.ijnss.2019.09.011
29. Chiu, H. Y., Hsieh, Y. J., & Tsai, P. S. (2017). Systematic review and meta-analysis of acupuncture to reduce cancer-related pain. European journal of cancer care, 26(2), 10.1111/ecc.12457. https://doi.org/10.1111/ecc.12457
30. Miladinia, M., Molavynejad, S., Zarea, K., & Nouri, E. (2016). Massage Therapy in Patients With Cancer Pain: A Review on Palliative Care. Jundishapur Journal of Chronic Disease Care, 6. https://doi.org/10.17795/jjcdc-37356
31. Lee, J., Lee, W.B., Kim, W., Min, B., Lee, H., & Cho, S. (2015). Traditional herbal medicine for cancer pain: a systematic review and meta-analysis. Complementary therapies in medicine, 23 2, 265-74 .
32. Horneber, M., Bueschel, G., Dennert, G., Less, D., Ritter, E., & Zwahlen, M. (2012). How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. Integrative cancer therapies, 11(3), 187–203. https://doi.org/10.1177/1534735411423920
33. Perera, P.K. (2019). Traditional Medicine-based Therapies for Cancer Management. Systematic Reviews in Pharmacy, 10, 90-92.

Supplementary Table 1: Demographic characteristics of the study participants (n=21)

Demographic characteristics		Frequency	Percentage %
Age (in years)	18-30	2	9.5
	31-40	3	14.3
	41-50	5	23.8
	51-60	7	33.3
	61-70	4	19.0
Ethnicity	Sinhala	18	85.7
	Tamil	2	9.5
	Muslim	1	4.8
Religion	Buddhism	14	66.7
	Catholic /Christianity	4	19.0
	Hindu	2	9.5
	Islam	1	4.8
Gender	Female	12	57.1
	Male	9	42.9
Current Marital status	Married	16	76.2
	Unmarried	2	9.5
	Divorced/ separated	1	4.8
	Widow	2	9.5
Highest level of education	Not been to school	0	0
	Grade 1-5	4	19.0
	Grade 6-11	10	47.6
	Grade 12-13	6	28.6

	Graduate	1	4.8
	Post graduate	0	0
Monthly income (LKR)	< 5,000	18	85.7
	5,001-10,000	0	0
	10,001-15,000	0	0
	15,001-20,000	0	0
	>20,000	3	14.3
Type of family	Nuclear	11	52.4
	Extended	10	47.6
Availability of helper	Yes	15	71.4
	No	6	28.6
Family responsibilities	Yes	13	61.9
	No	8	38.1
Time since diagnosis of cancer	< 1 year	11	52.4
	> 1 year	10	47.6
Type of Cancer	Uro-genital	4	19.0
	Gastro-intestinal	6	28.6
	Breast	4	19.0
	Other	5	23.8
	Lung	2	9.5
Duration of cancer pain	1-3 months	9	42.9
	>3 months	12	57.1
Presence of co-morbid diseases	Yes	6	28.6
	No	15	71.4

Supplementary Table 2: Theme 1: Understanding pain

Meaning units	**Condensed Meaning units**	**Codes**	**Categories**	**Themes**
"This pain is the biggest problem I ever had." *"It is so hard ...not to let this kind of pain happen again."*	Persisting pain despite being on medications. Episodes of pain experienced seem intolerable.	Pain is the biggest problem.	Physical and emotional impact	Understanding pain
“I am thinking is this a ‘karma’ which I had done in a previous birth.”	People believe that the pain experienced as a result of doing in previous births/destinies.	‘Karma’ causes pain	Cultural and spiritual interpretations	
“The God is the one who gave me this pain.”	This pain is given by god/ or super-natural power as a punishment	God-given the pain		

Supplementary Table 3: Theme 2- Coping strategies for living with pain

Meaning units	**Condensed meaning units**	**Codes**	**Categories**	**Themes**
Otherwise, I go for a walk with my kitten and puppy... it helps me to pain relief."	Used to do something that distracts the feeling of pain Engage in hobbies	Use of distraction methods	Medication and self-control	**Coping strategies for living with pain**

I do not let others at home know that I am in pain. So I bear-up on tight somehow."	Used to tolerate pain by him/herself without letting the others know	Positive thinking		
"I offer flowers, light, every morning and evening to Lord Buddha... it gives me happiness."	Believe in religious rituals to relieve pain and to get mental satisfaction. Praying/ hoping	Find ways of relaxation/ reduce the stress of life	Seeking spiritual support	
I pray when I get unbearable pain or sadness. Then I feel a bit at ease."	Believe in God/ Jesus in relieving pain	Seek God's support/ trust/hope		
"I did 'yanthra manthra adurukam' to get a relief. They gave kashaya"	Believe in traditional customs native treatment	Seek the help of super-natural powers		
"People in my workplace too helped me a lot… it is a great relief for me".	Some people help the patients to cope with pain, share grievances, and pain relief.	Positive social relationships	Receiving social support	
"I took 'Sinhala beheth from vedamahaththaya, not only these drugs."	Patients try several home remedies and other alternative treatment methods for pain relief.	Find pain-relieving methods	Exploring alternative treatments lifestyle	
"I adjusted the time of taking drugs a little bit."	They used to take medications given by the pain clinic,	Taking medications as prescribed	Adapting daily life	

	timing adjusted to their lifestyle.	without any fail		
"I used to take two tablets of Paracetamol and go to sleep."	Some patients have taken pain medications over the counter to control unbearable pain.	Taking medications out of prescription		
"I used to do my work slowly when the pain goes.." *"Most of the time, I used to stay at home because of pain."*	Patients have adjusted the speed of daily activities within their limits. Practice life-style changes to escape from pain	Adjustments to daily chores		

Semi-Structured Interview Guide

Introduction

- Welcome and thank the participant and self-introduction, name, and general affiliation
- Explain the general purpose of the interview with the information sheet, and obtained their written informed consent to conduct the interview,
- Explain the presence and purpose of recording equipment.
- Emphasize that there are no right or wrong answers, and participants should feel free to share their honest experiences

Questions

1. Can you describe the nature of your pain?
2. How does the pain affect your daily life?
3. Can you share any specific experiences you had due to this pain
4. Would you please describe how you could overcome those difficulties
5. Have you made any changes to your daily routine or lifestyle to manage your pain better?
6. Did your pain affect any other aspects of your life (e.g. Employment, social relationships)
7. How does the pain affect your relationship with your partner and family / How do your family and friends react to your pain
8. Are there times when you get upset about your pain? Can you please tell me what you do/feel during such times?
9. With whom would you like to talk/share your concerns
10. Who are the people in your life that you rely on for support when dealing with your pain (e.g., family, friends, support groups)?
11. What medications or treatments have you used to manage your pain? How effective have they been?
12. Do you practice or believe any other non-medical therapies to alleviate pain
13. Besides medication, are there any self-control techniques you use to manage your pain
14. According to your religion, to what extent have you received any spiritual support? If yes, what type of support you received
15. Is there anything else you would like to share about your experience with pain and how you cope with it?

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

Title and abstract

	Page/line no(s).
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pg 1 line 1,2
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pg 1

Introduction

Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Page 3 Line 46-104
Purpose or research question - Purpose of the study and specific objectives or questions	line 103-104

Methods

Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	line 108-112
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	title page page 6 line 129
Context - Setting/site and salient contextual factors; rationale**	Pge 5
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Line 115-116 Page 4-5 Line 118-120
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Page 4-5 line 165-166 129-145
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	page 5-6 line 129-145

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Page 6 Line 123-127
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Page 8 Line 168-173
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Page 7 Line 148-154
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Page 7 Line 148-154
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Page 7 Line 156-163

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Page 8-13 Line 168-283
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Page 8-13 Line 168-283

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Page 13-14 Line 285-316
Limitations - Trustworthiness and limitations of findings	

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Page 20
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	title Page

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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Coping with Cancer Pain: A Qualitative Study to Explore Pain Perception and Self-Coping Strategies of Cancer Patients in Sri Lanka.

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Coping with Cancer Pain: A Qualitative Study to Explore Pain Perception and Self-Coping Strategies of Cancer Patients in Sri Lanka.

Edirisinghe NP[1,2], Makuloluwa PTR[3], Amarasekara AATD[4] , Goonewardena CSE[5,6]

[1] Department of Fundamental Nursing, Faculty of Nursing, University of Colombo, Sri Lanka niroshae@fnd.cmb.ac.lk

[2] Faculty of Graduates Studies, University of Sri Jayewardenepura, Sri Lanka,

[3]Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka, makuloluwaptr@kdu.ac.lk

[4]Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka, thamara@sjp.ac.lk

[5]Department of Community Medicine, Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, sampatha@sjp.ac.lk

[6]Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

Corresponding Author: Dr. Nirosha Priyadarshani Edirisinghe, keenirosha@yahoo.com, niroshae@fnd.cmb.ac.lk, +94718435907

Postal Address: 1B2, Kolamadiriya, Bandaragama, Sri Lanka

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Coping with Cancer Pain: A Qualitative Study to Explore Pain Perception and Self-Coping Strategies of Cancer Patients in Sri Lanka.

Abstract

Pain is one of the most debilitating symptoms of cancer, substantially diminishing one's quality of life. The level of pain experienced is eventually determined by the pain coping strategies adopted by patients individually. The awareness of the ‘self-coping methods of pain’ of individual patients would be beneficial for the multidisciplinary pain team to consider such methods when planning future interventions to manage pain.

Objectives: This study explores the pain perception and coping strategies used by patients with cancer pain in Sri Lanka.

Design: A descriptive qualitative study.

Setting: Pain management unit, Apeksha Hospital, Maharagama, Sri Lanka.

Participants: The study was conducted among purposively selected patients with cancer and registered at the pain management unit. Twenty-one semi-structured interviews were conducted until data saturation.

Data were analyzed using Graneheim and Lundman's content analysis method. Ethical clearance was obtained from the Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17).

Results: Most participants were between 51 and 60 years old and identified as Sinhalese Buddhists. The study's findings revealed two sub-themes under ‘Understanding pain’, namely ‘Physical and emotional impact’ and ‘Cultural and spiritual interpretations’, and five sub-themes under ‘Coping strategies for living with pain’, namely ‘Medication and self-control’, ‘Seeking spiritual support’, ‘Receiving social support’, ‘Exploring alternative treatments’ and ‘Adapting daily life’.

Conclusion: Coping strategies were adopted especially in achieving essential life aspirations and participating in preferred activities. Goals or activities were often adjusted to fall within their health limits. Acceptance and progress in life were considered more important than pain control. We recommend giving due consideration to the ‘self-coping strategies’ of individual patients in designing interventions to mitigate cancer pain.

Keywords: cancer pain; coping strategies; pain perception; qualitative study; Sri Lanka

Data availability statement

Data are available upon reasonable request.

Article Summary

Strengths and limitations of this study

- The study's qualitative approach and in-depth exploration of cancer patient's pain perception and coping strategies, provide a nuanced understanding of patients' experiences.
- The inclusion of a diverse range of cancer patients ensures variability in experiences and contributes to a more comprehensive understanding of the coping strategies across various contexts.
- The study's methodological rigor includes interviewing until theoretical saturation, having the same investigator conduct all interviews, and addressing potential translation issues to improve data reliability and credibility.
- The study is limited to the cultural context of Sri Lanka, and the findings may not be readily applicable to other cultural contexts.

1. Introduction

Pain is the most common and complex symptom experienced at various points in the cancer journey, both pre- and post-treatment. Cancer treatments or the tumor itself can directly or indirectly cause cancer pain.[1] Pain is the most distressing and intolerable symptom for cancer patients, and its intensity increases as the disease progresses.[2] Cancer patients with longstanding pain experience significantly worse quality of life compared to those with less persistent pain. This deterioration is due to decreased function, increased emotional distress, and heightened depressive symptoms, creating a vicious cycle that further impacts their well-being.[3]

Quality of life in this context refers to the overall well-being encompassing physical health, emotional state, level of independence, social relationships, personal beliefs, and their relationship to salient features of the environment. Predicting the effectiveness of pain interventions requires understanding patients' beliefs about pain, their perception of pain, and their current coping strategies. Unrealistic or negative thoughts about pain can exacerbate the pain experience, emotional distress, decreased daily activity, decreased functional outcome, decreased length of stay, and increased medication dependence.[4] When a disease cannot be cured, patients may still benefit from pain interventions to enhance their quality of life.[5]

Studies have shown that personal experiences with pain and individual coping strategies significantly influence how patients adapt to pain.[6] Research indicates that individuals experiencing persistent pain are very likely to develop coping skills to help manage their pain. For example, a study by Turk and Monarch (2002) found that a high percentage of chronic pain patients report using various coping strategies to deal with their pain.[7] However, it is important to note that not all coping and adaptive strategies employed by people with chronic pain are beneficial from a psychological or physical perspective.[8] Some pain-relieving techniques can exacerbate pain.[6] Therefore, it is critical to understand how patients react to and cope with pain. While coping skills may not necessarily reduce the pain itself, they can significantly modify the impact of pain, helping patients manage the emotional and psychological stress associated with chronic pain. Coping strategies are based on cognitive, emotional, and behavioral responses to overcome health threats. Coping skills may positively impact treatment outcomes and survival rates of cancer patients.[9] Furthermore, advanced disease can significantly affect the physical and psychological well-being of patients, often resulting in a reduced quality of life and increased emotional distress. Although it is not inevitable that advanced disease leads to mental instability, patients may experience heightened anxiety, depression, or psychological distress.[10] Coping strategies based on behavioral and psychological mechanisms help people manage their stress and improve their quality of life. Therefore, supporting and encouraging adaptive pain coping skills can benefit cancer patients, even in the advanced and incurable stages of their disease.[11] Currently, coping support is included in interventions for patients with advanced cancer.[12,13] These interventions can also be tailored to align with patients' self-coping strategies.

Primary coping mechanisms are ‘problem’ and ‘emotion’ focused. Problem-oriented tactics consist of acts that reduce or alter stressful circumstances. Emotion-focused strategies aim to regulate the emotional effects of stress and achieve affective and emotional equilibrium.[14,15] It is important to note that coping support is not limited to patients with advanced cancer. In many healthcare systems, including those in developed countries, coping support is available at various stages of the cancer journey, from pre-diagnosis to post-treatment.[12,13] However, the availability and scope of these services can vary significantly depending on the healthcare infrastructure and resources of a particular country.

Meegoda et al. conducted a descriptive cross-sectional study in Sri Lanka among 124 patients with cancer, and the majority (68%) reported pain relief as the most common reason for their readmissions.[16] In Sri Lanka, where this study is based, coping support may be more prominently featured in interventions for patients with advanced cancer due to resource limitations. Supporting and encouraging adaptive pain coping skills can benefit cancer patients, even in advanced and incurable stages of their disease.[11] These interventions can also be tailored to align with patients' self-coping strategies. Since pain is a unique and subjective experience, using structured quantitative data to investigate pain perception and coping strategies in cancer patients is insufficient. Given the varying cultural, religious, and economic contexts of Sri Lankan society, descriptive research is necessary to enhance and deepen comprehension of pain perception and coping strategies, among Sri Lankan cancer patients.[17] This could assist in determining how best pain coping methods among cancer patients in Sri Lanka can be supported. The present study was conducted in the absence of sufficient information and scientific literature on the ‘pain perception’ and ‘self-coping strategies’ of cancer patients in Sri Lanka.

2. Materials and Methods

2.1 Study design

A qualitative descriptive study was undertaken to explore the individual coping strategies of patients suffering from cancer pain in Sri Lanka. This study takes a constructivist approach, recognizing the subjective aspect of cancer patients' pain experiences and aiming to understand the many interpretations given to these experiences by people.

2.2 Study setting and participants

The study employed purposive sampling to ensure a diverse and representative sample of cancer patients experiencing pain who visited the Pain Management Unit of the premier cancer hospital in Sri Lanka, Apeksha Hospital, Maharagama. The inclusion criteria were carefully selected to identify participants who could provide rich, relevant data on coping strategies. Specifically, patients aged 18 and older with cancer-related pain and pain scores of 3 or higher on a Numerical Rating Scale (NRS) were recruited. NRS was a 0-10 scale, where 0 represented "no pain" and 10 represented "worst possible pain." This criterion ensured that all participants were experiencing significant pain, making their coping strategies particularly pertinent to the research objectives. Purposive sampling was implemented to capture a wide range of experiences and perspectives. The principal investigator intentionally selected participants varying in age, sex, educational level, cancer type, and treatment stage. This approach ensured that the sample reflected the heterogeneity of the broader population of cancer patients.

Patients were required to be Sinhala-speaking and to provide informed written consent, ensuring they could fully understand the study's purpose and consent process. Exclusion criteria included patients with pain of non-cancerous origin, mental illness, or brain metastases, as these conditions could introduce confounding variables that might obscure the specific coping strategies related to cancer pain.

During the recruitment process, patients who met the inclusion criteria were identified from the Pain Management Unit at Apeksha Hospital.Among those who consented, the principal investigator selected participants to ensure a diverse sample. This selection considered demographic and clinical characteristics to ensure a broad representation of experiences. In this study, theoretical saturation was achieved when the semi-structured interviews with 21 participants yielded no new themes or significant variations in the data.

2.3 Study instruments

The semi-structured interview guide (Supplementary File 1) was developed through an extensive literature review and refined by subject experts. The guide was pre-tested on five patients with cancer pain to ensure its effectiveness. During this pre-testing, it was found that some probing questions were too complex for participants to answer easily, necessitating rewording for clarity and simplicity. Additionally, the pre-test aimed to determine whether the interview questions elicited responses that broadly covered the topic areas of interest. The goal was not to find "right" or "wrong" answers but to ensure that the questions were effective in capturing the full range of participants' experiences and perspectives on the topics being studied. The pre-test also identified issues related to interview duration and transcription. Based on the feedback from this pre-testing, the interview guide was updated to simplify complex questions, ensure comprehensive coverage of relevant topics, and address logistical issues related to interview time and transcription.

2.4 Data collection

The principal investigator, who is both a qualified nurse and an experienced qualitative researcher, conducted semi-structured interviews with 21 participants using an interview guide between December 2018 and April 2019, until theoretical data saturation was achieved. Data saturation is a concept in qualitative research that refers to the point at which no new information or themes are observed in the data.[18] This means that additional interviews no longer contribute to new insights or variations in the themes being studied. In this study, data saturation was reached when no new topics emerged in the interviews, and no additional themes were generated from the data. Given that interviews and data analysis were conducted concurrently, data saturation was identified through ongoing analysis. The research team continuously reviewed and coded the interview transcripts, and once it was observed that subsequent interviews were not producing new themes or significant new information, data saturation was considered achieved.

The interviewer introduced herself, explained the interview's objective using an information sheet, and allowed participants time to consider before providing informed consent. The informant was guaranteed that the information would be kept confidential and that their identity would never be disclosed in any written documentation. It was emphasized that he/she had the freedom to speak any opinion without fear of condemnation. The word 'cancer' or any synonym with a comparable meaning was deliberately avoided to reduce distress for the informant. The term 'the sickness treated at this hospital' was employed instead. The informant admitted that clinical professionals would only be informed when necessary. Consent from the informant was requested in such instances. Before the interview, each participant provided informed written consent, including permission to record the session. The interviews took place in a quiet room at the pain clinic or in a separate area in the hospital to ensure participants' comfort and privacy.

During the interviews, nonverbal indicators were observed to gain a deeper understanding of the participants' experiences and emotions. Nonverbal cues, such as facial expressions, body language, and gestures, can provide valuable insights into a participant's feelings and attitudes that may not be fully captured through verbal responses alone. Observing these indicators helped the interviewer to interpret the emotional context of the responses and to probe further when necessary.

Notes on nonverbal indicators were taken during the interviews and were later used in the data analysis process to complement and enhance the understanding of the verbal data. The interviewer endeavored to remain open and impartial throughout the interviews, meaning she consciously maintained a neutral stance, actively listened without expressing personal opinions or judgments, and allowed participants to share their experiences and perspectives freely. The interviews ranged from 30 to 60 minutes in duration.

2.5 Data analysis

Qualitative data were processed using Granehiem and Lundman's content analysis methods.[19] The data collection and analysis were conducted simultaneously to allow for continuous refinement of the research process and identification of emerging themes.

All interviews were audio-recorded and then transcribed verbatim. The transcriptions were checked against the audio recordings for accuracy and completeness. The transcripts were read multiple times by the principal investigator to become thoroughly familiar with the data and to identify initial impressions. Each transcript was reviewed immediately after transcription to identify meaningful units of text. These units of meaning, such as phrases, sentences, or paragraphs relevant to the research questions, were highlighted and assigned initial codes. The initial codes were grouped into categories based on similarities and patterns identified in the data. This involved organizing codes into broader categories that reflected the key aspects of the data. As new interviews were conducted, the ongoing analysis allowed for the integration of new data with existing categories and codes. This iterative process helped in refining the categories and identifying any new themes that emerged. After coding several transcripts, the codes were reviewed and integrated into the data set as a whole. This step involved comparing and merging codes across all transcripts to ensure consistency and comprehensiveness. Within each category, subcategories were developed to further organize the data into more specific themes. This step helped in understanding the nuances and variations within each category. The categories and subcategories were analyzed to identify overarching themes. These themes represented the latent meanings and central ideas that emerged from the data. The themes were interpreted and refined through discussion among the researchers until a consensus was reached.

2.6 Trustworthiness

The data's reliability was assessed using Guba and Lincoln's guidelines.[20] To achieve credibility, the following steps were incorporated into the process; the principal investigator

(PI) spent significant time in the field, developing strong relationships with participants, which helped build trust and obtain rich, in-depth data; two cancer pain patients who did not participate in the study reviewed the codes and themes to ensure they accurately represented their experiences; the use of multiple sources of data (interviews with diverse participants) and multiple researchers in the coding process helped to verify the findings and reduce bias; further external qualitative research experts reviewed the units of meaning, codes, subcategories, categories, and themes, and provided feedback that was incorporated into the final analysis.

Transferability was achieved through the selection of a purposeful diverse sample of participants with a wide range of experiences, enhancing the potential for the findings to be applicable to other similar settings.

The dependability of the study was achieved through maintaining detailed records of the research process, including data collection and analysis procedures, were maintained which allows others to follow the research steps and verify the study's findings. Further, multiple transcripts were reviewed and coded by the PI, and the codes were compared and refined to ensure consistency and reliability in the coding process. External qualitative research experts reviewed the research process and findings, offering an additional layer of scrutiny to enhance reliability.

The PI maintained a reflexive journal to document personal reflections, potential biases, and decisions made throughout the research process, and field notes helped to ensure that the findings were grounded in the data rather than influenced by the researcher’s preconceptions and achieved confirmability of the study.

2.7 Ethical considerations

Ethical approval was granted for this study by the Ethics Review Committee, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17). All patients provided written informed consent prior to enrolment in the study.

2.8 Patient and Public Involvement

None

3. Results

The majority of the participants (n=21) were Sinhala Buddhists between the ages of 51 and 60. There were 12 (57.1%) females and 16 (76.2%) married people. The majority of participants earned less than LKR 5,000 per month and had attended Grades 6-11. Among the participants, 57% reported experiencing pain for three months or longer, and 52% had cancer for less than one year. The demographic characteristics of the study participants are shown in Supplementary Table 1.

This theme encompasses participants' descriptions of their pain experiences and the cultural and spiritual contexts influencing their perceptions. It includes two subthemes: "Physical and Emotional Impact" and "Cultural and Spiritual Interpretations." as summarized in Table 1.

Table 1: Themes and subthemes emerged in cancer patients with pain (n=21)

Themes	Sub-themes
Understanding pain	Physical and emotional impact
	Cultural and spiritual interpretations
coping strategies for living with pain	Medication and self-control
	Seeking spiritual support
	Receiving social support
	Adapting daily life
	Exploring alternative treatments lifestyle

3.1 Understanding Pain

This theme encompasses participants' descriptions of their pain experiences and the cultural and spiritual contexts influencing their perceptions. It includes two subthemes: "Physical and emotional impact" and "Cultural and spiritual interpretations. The severity of pain in cancer patients ranged from mild to severe. Most people described their pain as unpleasant and distressing, with negative physical and emotional consequences. Participants expressed various reactions to their pain. The intensity of the pain made participants feel helpless and hopeless, and many believed cancer and pain were synonymous. The supplementary Table: 2 shows the meaning units, codes, and categories under theme 1: Understanding pain.

Physical and emotional impact

Participants reported excruciating pain. It was their primary concern. Significant cancer pain was deemed to be difficult to bear. Some have tried to commit suicide as a result of unbearable pain. Some argue that it is better to die than to endure this pain. Some claim that having cancer is tolerable yet painless.

> *"When the pain is unbearable, I think living is also a problem. I still wonder why I live. So, when the pain comes, it is so difficult."* (A female aged 60-70 years old with cancer in the pancreas*)*
>
> *"It is so hard ... not to let this kind of pain happen again... not even to an enemy…."* (A male participant aged 60- 70 years with cancer in the rectum*)*
>
> *"I cannot bear this pain anymore…." (*A male participant aged 60-70 years old with cancer in the bladder*)*

Cultural and spiritual interpretations

The cultural and spiritual beliefs of participants influenced their perceptions of pain. Patients tried to find the cause of their disease, although they felt uncertain about it. However, some patients thought that cancer and pain were their destiny. Buddhist people tend to believe that this pain is due to the sins they have committed in their previous births. While some doubt about ‘why this has happened to me’?

> *"These are sins of previous births. More than this, the thieves attacked even Arahat Mugalan thero* [one of the Buddha's closest disciples] *because of previous sins... Nobody can stop this... We have to face them." (*A male participant aged 60-70 years old with cancer in the bladder*)*

> *"When the pain rises, I am thinking is this a 'karma'* [how a person's deeds in this and prior realms of existence affect their fate in subsequent existences] *which I had done in a previous birth. Otherwise, according to my knowledge, I have not made any misdeeds in this birth". (*A female aged 50-60 years old with breast cancer*)*

> *“I have not done any misdeeds in this birth according to my knowledge… why this has happened to me?" (*A male participant aged 20-30 years old*)*

3.2 Coping strategies for living with pain

Individuals were motivated to achieve important life aspirations and participate in preferred activities. Goals or activities were frequently modified to align with their current health status. The majority believed that acceptance and progress in life were more important than indulging in complete pain control. Therefore, they used to practice several self-coping strategies to live with pain. This theme includes five subthemes: "Medication and self-control," "Seeking spiritual support," "Receiving social support," "Adapting daily life," and "Exploring alternative treatments. "The meaning units, codes, and categories under Theme 2: Coping strategies for living with pain are shown in Supplementary Table 3.

3.2.1 Medication and self-control

Many participants used pain medication given by the clinic regularly, and some reported good efficacy and believed that it was the best way to control pain. Many have practiced some distraction methods that may be unique to themselves to achieve pain relief.

"I used to go to a shop nearby my home and used to have a chat with the shop owner when the next medication time is due... Otherwise, I go for a walk with my kitten and puppy... it helps me with pain relief." (A male participant aged 20-30 years old)

"I always try to do something in my garden... Otherwise, talk to somebody. If I stay alone or do nothing, the pain is high. So. I always try to pay attention to whatever the thing. However, I cannot do things like reading a book. I cannot be seated at a place for some time." (A male participant aged 60-70 years old with prostate cancer)

I do not let others know that I am in pain because my mom is scared. [Her mother is 80 years old and bedridden]... So, I bear upon tight somehow. When the pain is unbearable only, I shout." (A female aged 60-70 years old with back pain)

3.2.2 Seeking spiritual support

Religious and spiritual activities provided comfort and relief for many participants. They tried to be more religious and spiritual. Most of the Buddhist informants started understanding the teachings of Buddhist philosophy. Most of the informants tried to make up their minds with religious teachings. With the uncertainty of recovery, most of them worried about the future. Many have stated that they tend to do more religious activities after getting this disease and pain and believed it would give them relief.

"I offer flowers, light oil lamps, every morning and evening to Lord Buddha... it gives me happiness. The sight of an oil lamp itself is a great relief mentally." (A male participant aged 60-70 years old with prostate cancer)

"The only thing I can do now is pray to Jesus to heal me. I am always praying. I pray when I get unbearable pain or sadness. Then I feel a bit at ease." (A male participant with liver cancer)

"The only thing I can beg from God is to make me healthy. Right now, God is the only person there for me to ask whatever…. When I have unbearable pain, grief, or problem, I pray.

> *God will surely heal me. I know I am going to get up again…".* (A participant believes in Christianity*)*

3.2.3 Receiving social support

Patients reported that having assistance from relatives and friends alleviated their emotions of isolation and withdrawal. Most informants were happy about the support extended by family members, relatives, neighbors, and friends at the workplace. Most of the participants were aware of the importance of interpersonal relationships and expressed their appreciation during the interviews. As with any other person, patients with cancer pain value their social network.

> *"It relieves the pain a little bit when talking with somebody. Others tend to look after me after I got this disease... People in my workplace too helped me a lot… it is a great relief for me".* *(*A female aged 40-50 years old with breast cancer*)*
>
> *"I feel relieved of pain if somebody massages my legs... My younger sister will massage my legs when I am screaming with pain. She is applying hot water and massaging well. Then I feel better..."* (A female aged 30-40 years old with leg pain*)*

3.2.4 Adapting daily life

Participants mentioned 'adjusting' their behaviors to try to prevent pain, such as avoiding tasks that cause pain, but they were also reluctant to allow pain to control their function. Numerous individuals tolerate pain to keep their functionality. Many participants had changed their lifestyles to find relief from pain. They described these pain-modifying processes as working "with" their pain, including day planning and pain-relieving activities. Certain individuals, particularly those with comorbidities, paced their actions.

> *"I used to do my work slowly when the pain goes off... After taking drugs, little pain relief is there... Then only I can do whatever the household works little by little..."* *(*A female aged 40-50 years old with breast cancer*)*

> *"I adjusted the time of taking drugs a little bit. I am taking night medication around 11 pm, which is due at 8 pm. Moreover, I used to go to bed around 11 pm. Then I can sleep without pain till morning. Otherwise, I wake up around 2-3 am with pain. After that, I cannot sleep…." (*A male participant aged 20-30 years old*)*

> *"If I were to go somewhere, I used to get the drugs and go or plan the visit to come back before the time of due medication... Otherwise, avoid going anywhere... Most of the time, I used to stay at home because of pain". (*A female aged 50-60 years old with breast cancer*)*

3.2.5 Exploring alternative treatments

Patients employed alternative treatment methods to alleviate their pain, such as massage, acupuncture, and other non-pharmacological methods, adjustments to daily life to self-manage cancer pain. Even though the majority of patients received satisfactory pain relief with the pain medications obtained from the clinic, some of the informants wanted to try other traditional or alternative methods to get full recovery from pain and illness.

> *"I took 'Sinhala beheth'* {conventional treatment method} *from 'vedamahaththaya',* {the person who is practicing conventional treatment method} *and not only these drugs. I went everywhere... They gave oil to apply... it works... When I get pain, I ask my son to apply some oil… then the pain subsides". (*A male participant aged 60-70 years old*)*

> *"I did 'yantra mantra adurukam" {a type of custom practiced by ancestors believing to have some power of curing} to get relief. They gave 'kashaya' {a type of beverage given by Ayurvedic treatment method}. However, I did not get complete relief. If somebody tells me that place is good, I will go there and see." (*A male participant with back pain*)*

4. Discussion

The two major themes highlight the participants' perceptions of pain and the self-coping strategies they employed to manage it to the best of their abilities. The majority had experienced moderate to severe pain. Irrespective of religion or race, many participants attempted to interpret the pain perceived in the context of religious/ cultural beliefs. The majority were Buddhists, and they believed that the pain was due to misdeeds done in the previous births. Catholics and Muslims believed that it was the wish of God. Despite their self-confidence to withstand or manage less intense levels of pain, the majority experienced a sense of helplessness at some point in their lives when confronted with episodes of unbearable pain. 'Why me?' is a question that eight of the participants ponder. Similar statements were reported in the literature.[21] Some patients see God as their savior from illness, while others believe that God caused their illness as a punishment or a test of faith.[22,23]

In general, patients tried to maintain normalcy by tolerating some degree of pain. Participants had unique coping styles, strategies, and preferences for living with pain. ‘Medication and self-control’, ‘Seeking spiritual support’, ‘Receiving social support’, ‘Adapting daily life’, and ‘Exploring alternative treatments’ have emerged as sub-themes in this study. Meanwhile, they perceived pain under two subthemes: ‘physical and emotional impact’, and ‘cultural and spiritual interpretations’.

In a study done in Thailand, the most prevalent coping strategies among breast cancer survivors were reported as social support.[24] Similarly, a qualitative study conducted among newly diagnosed breast cancer patients in Iran revealed several prevalent self-coping mechanisms. These included religious approaches and spiritual fighting, various thoughts about the disease (positive thinking, hope, intentional forgetfulness; negative thinking: hopelessness, fear), accepting the disease (both active and passive acceptance), and finding support from social and cultural factors.[25] These coping mechanisms are comparable to our findings, highlighting the importance of social support and religious approaches in coping with cancer.

Research has shown that participants adapt to pain and use various activities as coping strategies. Boström et al. (2004) found that engaging in activities helped participants manage their pain. Although pain can limit activity, being active was identified as an effective coping mechanism.[26] For instance, some participants reported that engaging in work or physical activities provided pain relief. Distraction as a pain management strategy is well-documented in the literature Distraction techniques, such as focusing on activities, can reduce the pain perception by diverting attention away from the pain itself.[27]

Religious practices, such as chanting Buddhist sutras or listening to Buddhist chants, also served as distraction methods that helped participants find inner calm and cope with their pain. Xu et al. (2019) observed a similar phenomenon among Chinese participants, where religious practices were used to manage pain and provide emotional comfort.[28] The use of faith and religious practices as coping mechanisms is widespread, regardless of specific religious affiliations. This indicates that religious and spiritual practices can serve as powerful tools for distraction and emotional support in pain management.

Several participants reported using alternative treatments such as massage, acupuncture, and traditional medicine alongside their prescribed pain medications. Recent research supports the efficacy of some alternative treatments in managing cancer pain. For instance, a systematic review and meta-analysis conducted by Chiu et al. (2017) demonstrated that acupuncture is effective in reducing cancer-related pain and enhancing quality of life.[29] Another study by Miladinia et al., (2016) indicated that massage therapy can significantly alleviate pain and enhance the well-being among cancer patients.[30] Studies suggest that modern medicine combined with conventional treatments can effectively reduce cancer pain intensity and prevalence.[31]

However, while some alternative treatments can be beneficial, their use should be carefully considered and integrated with conventional medical treatments to ensure safety and effectiveness. Patients often turn to alternative treatments due to dissatisfaction with conventional pain management or a desire for more holistic care approaches.[32] Healthcare providers should be aware of these preferences and discuss potential benefits and risks with patients, ensuring an informed and balanced approach to pain management.

In the context of Sri Lanka, traditional medicine and alternative treatments are deeply rooted in cultural practices and beliefs. The use of Ayurvedic treatments, for instance, is common among Sri Lankan cancer patients seeking pain relief.[33] Understanding and respecting these cultural practices can enhance patient-provider communication and support more comprehensive pain management strategies.

In this study, the decision was made to avoid using the term “cancer” during interviews to minimize distress for participants. Instead, phrases like “the sickness treated at this hospital” were used. This decision may have helped participants feel less anxious and more willing to share their thoughts and feelings, potentially leading to richer and more valid data. It demonstrated sensitivity to the emotional state of participants, fostering trust and openness. On the other hand, avoiding the term “cancer” could have affected the specificity and depth of the responses. Participants might have provided more general answers, potentially missing out on more direct and nuanced discussions about their cancer-related pain and experiences. This could impact the study's ability to fully capture the complexities of coping with cancer pain.

Concurrent data collection and analysis allowed iterative refinement of the interview guide, early identification of themes, and increased flexibility in adapting the study based on emerging data, while it has some limitations; time and resource intensive, risk of bias influencing subsequent interviews, complexity in managing and integrating data.

Despite the strengths of this study, we wish to acknowledge several methodological limitations. The qualitative approach, while suitable for exploring individual experiences, involves subjective interpretation that can introduce bias. The sample, drawn from a single institution (Apeksha Hospital, Sri Lanka), may limit the generalizability of the findings. Despite efforts to include a diverse range of participants, the results may not represent all cancer patients experiencing pain in different settings or cultural contexts. The use of semi-structured interviews depends on the interviewer's skills and neutrality, potentially introducing interviewer bias. Although pre-testing of the interview guide aimed to mitigate this, some nuances of participants' experiences may have been overlooked. Despite the use of member checks and external expert reviews, the subjective nature of the coding and categorization process can influence the analysis. In this study, the PI endeavored to remain open and impartial throughout the data collection and analysis phases. However, while the development of strong relationships with participants was beneficial for gaining trust and obtaining richer data, it may have also introduced potential biases. These limitations provide context for interpreting the findings and highlight the need for further research to confirm and expand upon the insights gained from this study. Future research could benefit from incorporating multiple sites and employing mixed methods.

Conclusions and recommendations

Cancer pain was perceived as unpleasant, distressing, and impacting negatively on the overall quality of life. The study revealed the self-devised coping strategies used with positive outcomes to obtain relief from cancer pain and associated suffering. The strategies adopted were multidimensional, predominantly shaped by the individual's culture, religion, and beliefs, and were often adjusted within the constraints of their underlying health status, ultimately aiding in their ability to progress in life. Our findings favor taking individual perceptions of pain and self-coping strategies into account when planning and adopting measures to minimize the impact of cancer pain on the physical and psychosocial well-being of cancer patients. More research is needed to understand the effectiveness and integration of alternative treatments in managing cancer pain, especially within the cultural context of Sri Lanka. Furthermore, it is recommended to develop and test integrated care models that blend conventional and alternative treatments, specifically tailored to the cultural and healthcare context of Sri Lanka.

Author contributions

PTRM, AATDA, and CSEG contributed substantially to the work's concept design, and analysis, revised the article, and approved the version to be published. NPE conducted the research study, analyzed and interpreted the data, and drafted the article. All authors have read and approved the final manuscript and agreed to be accountable for all aspects of the work. The guarantor of the study is NP Edirisinghe; accepts full responsibility for the finished work and/or the conduct of the study, has access to the data, and controls the decision to publish.

Conflicts of Interest

All authors declare that they have no relevant conflicts of interest.

Funding

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Availability of data and materials

The data utilized to support the findings of this study are available from the corresponding author upon reasonable request.

Ethical considerations

Ethical approval was granted for this study by the Ethics Review Committee (ERC), Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka (App No: 28/17).

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References

1. Caraceni, A., & Shkodra, M. (2019). Cancer Pain Assessment and Classification. *Cancers*, 11(4), 510. https://doi.org/10.3390/cancers11040510
2. Akin Korhan, E., Yildirim, Y., Uyar, M., Eyigör, C., & Uslu, R. (2013). Examination of pain experiences of cancer patients in western Turkey: a phenomenological study. *Holistic nursing practice*, 27(6), 358–365. https://doi.org/10.1097/HNP.0b013e3182a72b76
3. Green, C. R., Hart-Johnson, T., & Loeffler, D. R. (2011). Cancer-related chronic pain: examining quality of life in diverse cancer survivors. *Cancer,* 117(9), 1994–2003. https://doi.org/10.1002/cncr.25761
4. Turk, D. C., & Wilson, H. D. (2010). Fear of Pain as a Prognostic Factor in Chronic Pain: Conceptual Models, Assessment, and Treatment Implications. *Current Pain and Headache Reports*, 14(2), 88–95. https://doi.org/10.1007/s11916-010-0094-x
5. Wells N, Pasero C, McCaffery M. (2008). Improving the Quality of Care Through Pain Assessment and Management. In: Hughes RG, editor. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. Rockville (MD): Agency for Healthcare Research and Quality (US); Chapter 17. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2658/
6. Noyman-Veksler, G., Lerman, S. F., Joiner, T. E., Brill, S., Rudich, Z., Shalev, H., & Shahar, G. (2017). Role of Pain-Based Catastrophizing in Pain, Disability, Distress, and Suicidal Ideation. *Psychiatry*, 80(2), 155–170. https://doi.org/10.1080/00332747.2016.1230984
7. Turk, D. C., & Monarch, E. S. (2002). Biopsychosocial perspective on chronic pain. In D. C. Turk & R. J. Gatchel (Eds.), Psychological approaches to pain management: A practitioner's handbook (2nd ed., pp. 3–29). The Guilford Press.

8. Litt, M. D., & Tennen, H. (2015). What are the most effective coping strategies for managing chronic pain?. *Pain management*, 5(6), 403–406. https://doi.org/10.2217/pmt.15.45

9. Guariglia, L., Ieraci, S., Villani, V., Tanzilli, A., Benincasa, D., Sperati, F., Terrenato, I., & Pace, A. (2021). Coping Style in Glioma Patients and Their Caregiver: Evaluation During Disease Trajectory. *Frontiers in Neurology*, 12, 709132. https://doi.org/10.3389/fneur.2021.709132

10. Smith, H. R. (2015). Depression in cancer patients: Pathogenesis, implications and treatment (Review). Oncology letters, 9(4), 1509–1514. https://doi.org/10.3892/ol.2015.2944

11. Greer, J. A., Jacobs, J. M., El-Jawahri, A., Nipp, R. D., Gallagher, E. R., Pirl, W. F., Park, E. R., Muzikansky, A., Jacobsen, J. C., Jackson, V. A., & Temel, J. S. (2018). Role of Patient Coping Strategies in Understanding the Effects of Early Palliative Care on Quality of Life and Mood. Journal of clinical oncology : official journal of the American Society of Clinical Oncology, 36(1), 53–60. https://doi.org/10.1200/JCO.2017.73.7221

12. Von Heymann-Horan, A. B., Puggaard, L. B., Nissen, K. G., Benthien, K. S., Bidstrup, P., Coyne, J., Johansen, C., Kjellberg, J., Nordly, M., Sjogren, P., Timm, H., Von der Maase, H., & Guldin, M-B. (2018). Dyadic psychological intervention for patients with cancer and caregivers in home-based specialized palliative care: The Domus model. *Palliative & supportive care*, 16(2), 189-197. https://doi.org/10.1017/S1478951517000141

13. Walshe, C., Roberts, D., Appleton, L., Calman, L., Large, P., Lloyd-Williams, M., & Grande, G. (2017). Coping Well with Advanced Cancer: A Serial Qualitative Interview

Study with Patients and Family Carers. *PloS one*, 12(1), e0169071. https://doi.org/10.1371/journal.pone.0169071

14. Carver, C. S., Scheier, M. F., & Weintraub, J. K. (1989). Assessing coping strategies: A theoretically based approach. *Journal of Personality and Social Psychology*, 56(2), 267–283. https://doi.org/10.1037/0022-3514.56.2.267
15. Carver, C. S., Pozo, C., Harris, S. D., Noriega, V., Scheier, M. F., Robinson, D. S., Ketcham, A. S., Moffat, F. L., Jr, & Clark, K. C. (1993). How coping mediates the effect of optimism on distress: a study of women with early-stage breast cancer. *Journal of personality and social psychology*, 65(2), 375–390. https://doi.org/10.1037//0022-3514.65.2.375
16. Meegoda, L., Fernando, S., Sivayogan, S., Atulomah, N. O., & Jayasiri, J. (2015). Perceived palliative care needs of cancer patients, nurses, and domiciliary care providers at a National Cancer Referral Facility, Sri-Lanka.
17. Chen, L. M., Miaskowski, C., Dodd, M., & Pantilat, S. (2008). Concepts within the Chinese culture that influence the cancer pain experience. *Cancer nursing*, 31(2), 103–108. https://doi.org/10.1097/01.NCC.0000305702.07035.4d
18. Guest, G., Bunce, A., & Johnson, L. (2006). How many interviews are enough? An experiment with data saturation and variability. Field Methods, 18(1), 59–82. https://doi.org/10.1177/1525822X05279903
19. Graneheim, U. H., & Lundman, B. (2004). Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse education today*, 24(2), 105–112. https://doi.org/10.1016/j.nedt.2003.10.001
20. Guba EG, Lincoln YS. (1981*). Effective Evaluation*. 1st ed. Jossey-Bass Publishers; San Francisco

21. Ghahramanian, A., Markani, A. K., Davoodi, A., & Bahrami, A. (2016). Spiritual Needs of Patients with Cancer Referred to Alinasab and Shahid Ghazi Tabatabaie Hospitals of Tabriz, Iran. *Asian Pacific journal of cancer prevention* : APJCP, 17(7), 3105–3109.

22. Elsner, F., Schmidt, J., Rajagopal, M. R., Radbruch, L., & Pestinger, M. (2012). Psychosocial and spiritual problems of terminally ill patients in Kerala, India. *Future oncology* (London, England), 8(9), 1183–1191. https://doi.org/10.2217/fon.12.97

23. Hsiao, S. M., Gau, M. L., Ingleton, C., Ryan, T., & Shih, F. J. (2011). An exploration of spiritual needs of Taiwanese patients with advanced cancer during the therapeutic processes. *Journal of clinical nursing*, 20(7-8), 950–959. https://doi.org/10.1111/j.1365-2702.2010.03278.x

24. Wonghongkul, T., Dechaprom, N., Phumivichuvate, L., & Losawatkul, S. (2006). Uncertainty appraisal coping and quality of life in breast cancer survivors. *Cancer nursing*, 29(3), 250–257. https://doi.org/10.1097/00002820-200605000-00014

25. Taleghani, F., Yekta, Z. P., & Nasrabadi, A. N. (2006). Coping with breast cancer in newly diagnosed Iranian women. *Journal of advanced nursing*, 54(3), 265–273. https://doi.org/10.1111/j.1365-2648.2006.03808_1.x

26. Boström, B., Sandh, M., Lundberg, D., & Fridlund, B. (2004). Cancer-related pain in palliative care: patients' perceptions of pain management. *Journal of advanced nursing*, 45(4), 410-419.

27. Eccleston, C., & Crombez, G. (1999). Pain demands attention: a cognitive-affective model of the interruptive function of pain. Psychological bulletin, 125(3), 356–366. https://doi.org/10.1037/0033-2909.125.3.356Chiu, H. Y., Hsieh, Y. J., & Tsai, P. S. (2017). Systematic review and meta-analysis of acupuncture to reduce cancer-related

pain. European journal of cancer care, 26(2), 10.1111/ecc.12457. https://doi.org/10.1111/ecc.12457

28. Xu, X., Cheng, Q., Ou, M., Li, S., Xie, C., & Chen, Y. (2019). Pain acceptance in cancer patients with chronic pain in Hunan, China: A qualitative study. *International Journal of Nursing Sciences*, 6(4), 385–391. https://doi.org/10.1016/j.ijnss.2019.09.011

29. Chiu, H. Y., Hsieh, Y. J., & Tsai, P. S. (2017). Systematic review and meta-analysis of acupuncture to reduce cancer-related pain. European journal of cancer care, 26(2), 10.1111/ecc.12457. https://doi.org/10.1111/ecc.12457

30. Miladinia, M., Molavynejad, S., Zarea, K., & Nouri, E. (2016). Massage Therapy in Patients With Cancer Pain: A Review on Palliative Care. Jundishapur Journal of Chronic Disease Care, 6. https://doi.org/10.17795/jjcdc-37356

31. Lee, J., Lee, W.B., Kim, W., Min, B., Lee, H., & Cho, S. (2015). Traditional herbal medicine for cancer pain: a systematic review and meta-analysis. Complementary therapies in medicine, 23 2, 265-74 .

32. Horneber, M., Bueschel, G., Dennert, G., Less, D., Ritter, E., & Zwahlen, M. (2012). How many cancer patients use complementary and alternative medicine: a systematic review and metaanalysis. Integrative cancer therapies, 11(3), 187–203. https://doi.org/10.1177/1534735411423920

33. Perera, P.K. (2019). Traditional Medicine-based Therapies for Cancer Management. Systematic Reviews in Pharmacy, 10, 90-92.

Supplementary Table 1: Demographic characteristics of the study participants (n=21)

Demographic characteristics		**Frequency**	**Percentage %**
Age (in years)	18-30	2	9.5
	31-40	3	14.3
	41-50	5	23.8
	51-60	7	33.3
	61-70	4	19.0
Ethnicity	Sinhala	18	85.7
	Tamil	2	9.5
	Muslim	1	4.8
Religion	Buddhism	14	66.7
	Catholic /Christianity	4	19.0
	Hindu	2	9.5
	Islam	1	4.8
Gender	Female	12	57.1
	Male	9	42.9
Current Marital status	Married	16	76.2
	Unmarried	2	9.5
	Divorced/ separated	1	4.8
	Widow	2	9.5
Highest level of education	Not been to school	0	0
	Grade 1-5	4	19.0
	Grade 6-11	10	47.6
	Grade 12-13	6	28.6

	Graduate	1	4.8
	Post graduate	0	0
Monthly income (LKR)	< 5,000	18	85.7
	5,001-10,000	0	0
	10,001-15,000	0	0
	15,001-20,000	0	0
	>20,000	3	14.3
Type of family	Nuclear	11	52.4
	Extended	10	47.6
Availability of helper	Yes	15	71.4
	No	6	28.6
Family responsibilities	Yes	13	61.9
	No	8	38.1
Time since diagnosis of cancer	< 1 year	11	52.4
	> 1 year	10	47.6
Type of Cancer	Uro-genital	4	19.0
	Gastro-intestinal	6	28.6
	Breast	4	19.0
	Other	5	23.8
	Lung	2	9.5
Duration of cancer pain	1-3 months	9	42.9
	>3 months	12	57.1
Presence of co-morbid diseases	Yes	6	28.6
	No	15	71.4

Supplementary Table 2: Theme 1: Understanding pain

Meaning units	Condensed Meaning units	Codes	Categories	Themes
"This pain is the biggest problem I ever had." *"It is so hard …not to let this kind of pain happen again."*	Persisting pain despite being on medications. Episodes of pain experienced seem intolerable.	Pain is the biggest problem.	Physical and emotional impact	Understanding pain
"I am thinking is this a 'karma' which I had done in a previous birth."	People believe that the pain experienced as a result of doing in previous births/destinies.	'Karma' causes pain	Cultural and spiritual interpretations	
"The God is the one who gave me this pain."	This pain is given by god/ or super-natural power as a punishment	God-given the pain		

Supplementary Table 3: Theme 2- Coping strategies for living with pain

Meaning units	Condensed meaning units	Codes	Categories	Themes
"Otherwise, I go for a walk with my kitten and puppy… it helps me to pain relief."	Used to do something that distracts the feeling of pain Engage in hobbies	Use of distraction methods	Medication and self-control	**Coping strategies for living with pain**

"I do not let others at home know that I am in pain. So I bear-up on tight somehow."	Used to tolerate pain by him/herself without letting the others know	Positive thinking		
"I offer flowers, light, every morning and evening to Lord Buddha... it gives me happiness."	Believe in religious rituals to relieve pain and to get mental satisfaction. Praying/ hoping	Find ways of relaxation/ reduce the stress of life	Seeking spiritual support	
"I pray when I get unbearable pain or sadness. Then I feel a bit at ease."	Believe in God/ Jesus in relieving pain	Seek God's support/ trust/hope		
"I did 'yanthra manthra adurukam' to get a relief. They gave kashaya"	Believe in traditional customs native treatment	Seek the help of super-natural powers		
"People in my workplace too helped me a lot… it is a great relief for me".	Some people help the patients to cope with pain, share grievances, and pain relief.	Positive social relationships	Receiving social support	
"I took 'Sinhala beheth from vedamahaththaya, not only these drugs."	Patients try several home remedies and other alternative treatment methods for pain relief.	Find pain-relieving methods	Exploring alternative treatments lifestyle	
"I adjusted the time of taking drugs a little bit."	They used to take medications given by the pain clinic,	Taking medications as prescribed	Adapting daily life	

	timing adjusted to their lifestyle.	without any fail		
"I used to take two tablets of Paracetamol and go to sleep."	Some patients have taken pain medications over the counter to control unbearable pain.	Taking medications out of prescription		
"I used to do my work slowly when the pain goes.." *"Most of the time, I used to stay at home because of pain."*	Patients have adjusted the speed of daily activities within their limits. Practice life-style changes to escape from pain	Adjustments to daily chores		

Semi-Structured Interview Guide

Introduction

- Welcome and thank the participant and self-introduction, name, and general affiliation
- Explain the general purpose of the interview with the information sheet, and obtained their written informed consent to conduct the interview,
- Explain the presence and purpose of recording equipment.
- Emphasize that there are no right or wrong answers, and participants should feel free to share their honest experiences

Questions

1. Can you describe the nature of your pain?
2. How does the pain affect your daily life?
3. Can you share any specific experiences you had due to this pain
4. Would you please describe how you could overcome those difficulties
5. Have you made any changes to your daily routine or lifestyle to manage your pain better?
6. Did your pain affect any other aspects of your life (e.g. Employment, social relationships)
7. How does the pain affect your relationship with your partner and family / How do your family and friends react to your pain
8. Are there times when you get upset about your pain? Can you please tell me what you do/feel during such times?
9. With whom would you like to talk/share your concerns
10. Who are the people in your life that you rely on for support when dealing with your pain (e.g., family, friends, support groups)?
11. What medications or treatments have you used to manage your pain? How effective have they been?
12. Do you practice or believe any other non-medical therapies to alleviate pain
13. Besides medication, are there any self-control techniques you use to manage your pain
14. According to your religion, to what extent have you received any spiritual support? If yes, what type of support you received
15. Is there anything else you would like to share about your experience with pain and how you cope with it?

Standards for Reporting Qualitative Research (SRQR)*

http://www.equator-network.org/reporting-guidelines/srqr/

Title and abstract

	Page/line no(s).
Title - Concise description of the nature and topic of the study Identifying the study as qualitative or indicating the approach (e.g., ethnography, grounded theory) or data collection methods (e.g., interview, focus group) is recommended	Pg 1 line 1,2
Abstract - Summary of key elements of the study using the abstract format of the intended publication; typically includes background, purpose, methods, results, and conclusions	Pg 1

Introduction

Problem formulation - Description and significance of the problem/phenomenon studied; review of relevant theory and empirical work; problem statement	Page 3 Line 46-104
Purpose or research question - Purpose of the study and specific objectives or questions	line 103-104

Methods

Qualitative approach and research paradigm - Qualitative approach (e.g., ethnography, grounded theory, case study, phenomenology, narrative research) and guiding theory if appropriate; identifying the research paradigm (e.g., postpositivist, constructivist/ interpretivist) is also recommended; rationale**	line 108-112
Researcher characteristics and reflexivity - Researchers' characteristics that may influence the research, including personal attributes, qualifications/experience, relationship with participants, assumptions, and/or presuppositions; potential or actual interaction between researchers' characteristics and the research questions, approach, methods, results, and/or transferability	title page page 6 line 129
Context - Setting/site and salient contextual factors; rationale**	Pge 5 Line 115-116
Sampling strategy - How and why research participants, documents, or events were selected; criteria for deciding when no further sampling was necessary (e.g., sampling saturation); rationale**	Page 4-5 Line 118-120
Ethical issues pertaining to human subjects - Documentation of approval by an appropriate ethics review board and participant consent, or explanation for lack thereof; other confidentiality and data security issues	Page 4-5 line 165-166 129-145
Data collection methods - Types of data collected; details of data collection procedures including (as appropriate) start and stop dates of data collection and analysis, iterative process, triangulation of sources/methods, and modification of procedures in response to evolving study findings; rationale**	page 5-6 line 129-145

Data collection instruments and technologies - Description of instruments (e.g., interview guides, questionnaires) and devices (e.g., audio recorders) used for data collection; if/how the instrument(s) changed over the course of the study	Page 6 Line 123-127
Units of study - Number and relevant characteristics of participants, documents, or events included in the study; level of participation (could be reported in results)	Page 8 Line 168-173
Data processing - Methods for processing data prior to and during analysis, including transcription, data entry, data management and security, verification of data integrity, data coding, and anonymization/de-identification of excerpts	Page 7 Line 148-154
Data analysis - Process by which inferences, themes, etc., were identified and developed, including the researchers involved in data analysis; usually references a specific paradigm or approach; rationale**	Page 7 Line 148-154
Techniques to enhance trustworthiness - Techniques to enhance trustworthiness and credibility of data analysis (e.g., member checking, audit trail, triangulation); rationale**	Page 7 Line 156-163

Results/findings

Synthesis and interpretation - Main findings (e.g., interpretations, inferences, and themes); might include development of a theory or model, or integration with prior research or theory	Page 8-13 Line 168-283
Links to empirical data - Evidence (e.g., quotes, field notes, text excerpts, photographs) to substantiate analytic findings	Page 8-13 Line 168-283

Discussion

Integration with prior work, implications, transferability, and contribution(s) to the field - Short summary of main findings; explanation of how findings and conclusions connect to, support, elaborate on, or challenge conclusions of earlier scholarship; discussion of scope of application/generalizability; identification of unique contribution(s) to scholarship in a discipline or field	Page 13-14 Line 285-316
Limitations - Trustworthiness and limitations of findings	

Other

Conflicts of interest - Potential sources of influence or perceived influence on study conduct and conclusions; how these were managed	Page 20
Funding - Sources of funding and other support; role of funders in data collection, interpretation, and reporting	title Page

*The authors created the SRQR by searching the literature to identify guidelines, reporting standards, and critical appraisal criteria for qualitative research; reviewing the reference lists of retrieved sources; and contacting experts to gain feedback. The SRQR aims to improve the transparency of all aspects of qualitative research by providing clear standards for reporting qualitative research.

**The rationale should briefly discuss the justification for choosing that theory, approach, method, or technique rather than other options available, the assumptions and limitations implicit in those choices, and how those choices influence study conclusions and transferability. As appropriate, the rationale for several items might be discussed together.

Reference:

O'Brien BC, Harris IB, Beckman TJ, Reed DA, Cook DA. **Standards for reporting qualitative research: a synthesis of recommendations.** *Academic Medicine*, Vol. 89, No. 9 / Sept 2014
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