



**2022**  
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SLIIT INTERNATIONAL CONFERENCE ON  
ADVANCEMENTS IN SCIENCES & HUMANITIES

**THE PROCEEDINGS OF  
SLIIT INTERNATIONAL  
CONFERENCE ON ADVANCEMENTS IN  
SCIENCES & HUMANITIES**

**“CREATING INNOVATIVE  
SOLUTIONS THROUGH RESEARCH”**

11<sup>th</sup> October, 2022

ORGANIZED BY



**FACULTY OF  
HUMANITIES & SCIENCES**



## Correlates of Severe Pain: Descriptive Study among Patients with Cancer in Sri Lanka

Edirisinghe NP<sup>\*1</sup>, Makuloluwa PTR<sup>2</sup>, Amarasekara AATD<sup>3</sup>, Goonewardena CSE<sup>4</sup>

<sup>1</sup>Faculty of Graduates Studies, University of Sri Jayewardenepura, Sri Lanka, Department of Nursing, Faculty of Humanities and Science, Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

<sup>2</sup>Department of Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka

<sup>3</sup>Department of Nursing and Midwifery, Faculty of Allied Health Sciences, University of Sri Jayewardenepura, Sri Lanka

<sup>4</sup>Department of Community Medicine, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, Cancer Research Center, Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka

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### ARTICLE INFO

#### Article History:

Received Date: 01 July 2022

Accepted Date: 15 September 2022

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#### Keywords:

Cancer pain; associated factors; correlates; Sri Lanka

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#### Citation:

Edirisinghe NP, Makuloluwa PTR, Amarasekara AATD, Goonewardena CSE. (2022). *Correlates of Severe Pain: Descriptive Study among Patients with Cancer in Sri Lanka*. Proceedings of SLIIT International Conference on Advancements in Sciences and Humanities, (11) October, Colombo, 275 - 279.

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### ABSTRACT

The most prevalent and unpleasant symptom that cancer patients encounter is pain. Pain is a highly subjective feeling resulting from the intricate interaction of bio-psycho-social aspects of the individual. The study aims to describe the correlates of severe pain in cancer patients in Sri Lanka. Methods: The descriptive study involved 384 cancer patients from Apeksha Hospital, Maharagama. Patients over 18 years who experienced cancer pain for three months or more, related to the primary lesion, secondary lesions, radiation, or chemotherapy were eligible. Patients whose pain is due to a non-cancerous source, triggered under three months of the assessment, and those who are too frail or disoriented with evidence of brain metastases are either unable or unwilling to give informed consent were excluded. The patients fulfilling inclusion criteria were recruited using the consecutive sampling method. The correlates of severe pain were determined using logistic regression. A validated Sinhala version of the Short Form Brief Pain Inventory and a pre-tested socio-demographic questionnaire was used to collect data. The correlates of severe pain were determined

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\*Edirisinghe, niroscha.e@sliit.lk

using logistic regression. Statistically significant correlation was shown between severe pain and 'male gender', (AOR=1.723; p=0.035); 'being in marriage' (AOR =1.947; p=0.026); 'patients with no perceived family commitments' (AOR=1.8; p=0.013) and pain of three months or more duration (AOR = 1.76; p=0.021). In conclusion it is discovered that the severe pain is positively correlated with males, 'being in a marriage,' 'no perceived family commitments, and in pain for over a three months duration.

## 1. INTRODUCTION

Pain is an enormous global health problem, growing day by day. It is a multifaceted and complicated experience that encompasses physical, social, and psychological dimensions. 'Globocan' report on Sri Lanka states that the incidence of cancer patients reported in 2018 was 23,530, while the number of cancer deaths was 14,013 with a five-year prevalence of 56,054 (Bray et al, 2018).

Identification of correlates for severe pain in patients with cancer would be helpful for earlier and better management of cancer-related pain. Pain may be more widespread in some subpopulations of cancer survivors, such as those diagnosed with breast and lung cancers related to the stage of cancer or the type of surgery done (Mayer et al, 2011; Forsythe et al, 2013). The severity and prevalence of chronic pain among cancer survivors also vary by racial group (e.g., blacks report more severe pain than whites) and gender (i.e., females experience more pain than males) (Green et al, 2011).

Moreover, younger age, longer duration of the disease, cancers of stage I-III, and specific treatment modalities like chemotherapy and radiotherapy have been found to correlate with the severity of pain (Beaek et al, 2021; van den Beuken-van Everdingen et al, 2016). The meta-analysis by Zaza and Babe showed that pain and psycho-social well-being are correlated (Zaza & Baine, 2002).

Apart from the recent evidence in the global literature on associated factors of cancer pain, it failed to trace data from similar studies done locally. Therefore, it is presumed that a proper understanding of this entity will have the potential to positively impact the preventive and therapeutic measures of cancer pain. This study primarily aims to describe the correlates

of severe pain among cancer patients in Sri Lanka.

## 2. METHODS AND MATERIALS

A descriptive cross-sectional study was carried out. The Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura, Sri Lanka, granted the ethical approval (App no: 28/17).

### 2.1 Setting and Subject Recruitment

The target population consists of patients, who are over the age of 18 years, diagnosed with cancer pain scores of >3 on the Numerical Rating Scale (NRS) that lasted at least three months or more due to the primary or secondary lesions, radiotherapy, or chemotherapy were included. The pain of non-cancerous origin lasted for less than three months, and patients who were frail/mentally unfit or disoriented and were unable or unwilling to provide informed permission were eliminated. The patients fulfilling inclusion criteria were recruited using the consecutive sampling method.

### 2.2 Study instruments

The Sinhala translated and validated Short Form Brief Pain Inventory (SF BPI) (Edirisinghe et al, 2021) and pre-tested questionnaire to assess associated factors for severe pain were used as an interviewer-administered questionnaire in this study.

### 2.3 Data collection

The study's eligibility criteria were verified by reviewing the patients' medical records and speaking with them. Prior to collecting data, informed written consent was obtained from the participants of the research. Data was collected by the principal investigator and a trained data collector during face-to-face interviews using the abovementioned instruments.

### 2.4 Statistical Analysis

The data analysis was performed using IBM SPSS Statistics version 23. The cut-off values for mild, moderate, and severe pain on the NRS scale were decided based on the widely

accepted findings from the study conducted by Serlin et al. (Serlin et al., 1995).

For bivariate analysis, the dependent variable; the 'worst pain,' was categorized into two: mild to moderate pain (NRS < 7 for 'worst pain') and severe pain (NRS > 7 for 'worst pain'). The independent variables chosen for correlation were combined into two groups based on the evidence from literature and expert opinion. To summarize the demographic and clinical characteristics of the patients, descriptive analysis was performed. Categorical variables such as gender, marital status, education, religion, and clinical features were compared using Chi-square and Fisher's exact tests. The correlates of severe pain were determined using logistic regression. The multivariate analysis considered only variables with a p-value of less than 0.1 as statistically significant in bivariate analysis. P values less than 0.05 were deemed statistically significant.

### 3. RESULTS

The mean age was 56.17, and SD  $\pm$ 11.83 ranged from 19–88 years, with a female: male ratio of 1.5:1.0 among the study participants. The majority were Sinhalese accounting for 86.7% (n = 333) and the proportion of Tamils were 8.6% (n = 33). The study population represented four main religions in Sri Lanka, with the majority being Buddhists (n = 285; 74.2%). Nearly 80% of study participants (n = 306) were married and 7% (n =27) were unmarried while 9.6% (n=37) were widowed.

As per the bivariate analysis, the male participants were 2.01 times more likely to experience severe pain than females (OR= 2.01; 95% CI=1.235-3.289, p=0.005). Age, ethnicity, religion, and marital status did not significantly correlate with severe cancer pain. There was no statistically significant association between

severe pain and assessed socio-economic characteristics, the patient's highest educational attainment (p=0.235), and the current status of employment (p= 0.746). The study participants who did not have family commitments were 1.73 times more likely to experience severe cancer pain than those with family commitments (OR = 1.73; 95% CI=1.098 - 2.744, p=0.018). Statistically, a significant association was not shown between the experience of severe pain and the availability of a caregiver (p=0.546) or type of the family (p=0.7). The participants who experienced the cancer pain over three months were 1.72 times more likely to develop severe pain than those who had pain for less than three months (OR= 1.72; 95% CI 1.097 - 2.727, p=0.018). No statistically significant association was found between severe pain and the type of cancer, time since the diagnosis of cancer (p=0.103), and the presence of co-morbidities (p=0.15). No statistically significant association was found with active cancer treatments (p=0.228) or previous surgery (p=0.904).

The omnibus testing of model coefficients indicated a final model with a chi-square value of 22.1 that was statistically significant at the p<0.001 level. The final model explained between 5.6% (Cox and Snell R<sup>2</sup>) and 8.1% (Nagelkerke R<sup>2</sup>) of the variance in severe pain. All variables included in the multivariate analysis were retained as significant correlates of severe pain in the final model after adjusting for confounding effects. Males (AOR=1.723, 95% CI = 1.03 – 2.86), who were married (AOR= 1.947, 95% CI= 1.082-3.504), having a pain for more than three months (AOR=1.76; 95% CI = 1.09 – 2.84), with no family commitments (AOR= 1.84; 95% CI = 1.136-2.993) showed a statistically significant correlation with severe pain as shown in Table 1.

Table 1: Correlates of severe pain experienced following Multivariate Analysis

Factor	B	SE (B)	Wald	P-value	Adjusted OR Exp (B)	95% CI for Exp( B)
Duration of cancer pain for more than three months	0.567	0.245	5.368	0.021	1.763	1.091-2.848
Absence of family commitments	0.612	0.247	6.131	0.013	1.844	1.136-2.993
Being in marriage	0.666	0.300	1.940	0.026	1.947	1.082-3.504
Male gender	0.544	0.259	4.423	0.035	1.723	1.038-2.860

Note: OR = odds ratio. CI = confidence interval, B = unstandardized regression weight,

#### 4. DISCUSSION

This descriptive cross-sectional study described the correlates of severe pain among cancer patients. At the time of designing the study, research with similar objectives had not been conducted and published locally.

In the current study, associated factors of severe pain are described under four main areas: demographic and socioeconomic factors, current health status-related factors, family-related factors, and cancer treatment-related factors. The gender being male emerged as a significant correlate of severe pain in our study; however, a more recent study by Broemer et al. (Broemer et al., 2021) and Shega et al. (Shega et al., 2014) find a significant association between moderate to severe cancer pain with females, which is not in line with the findings of the present study. Further, Broemer et al. find that younger patients who are less educated and unemployed experience more severe pain frequently (Broemer et al., 2021). Similarly, Shega et al. (Shega et al., 2014) report that younger patients (<55 years) whose school education is limited to ten years or less, experience a higher pain severity than those who have more than ten years of education, which is not a significant finding in the present study.

Current health-related characteristics were taken into special consideration as predictors of severe pain. However, only the participants with more than three months of pain are more likely to experience severe pain. This observation may reflect the extent of the underlying disease and inadequate measures taken to control pain. According to Broemer et al. (Broemer et al., 2021), the highest pain levels are found in patients with cancers in the head and neck area. Similarly, it is observed that those with oro-facial cancers have severe pain, two times higher than others in the present study; however not statistically significant. Similarly, Isaac et al. (Isaac et al., 2012) report that compared to individuals with other cancers, those with cancers in the head, neck, stomach, or thorax are more prone to experience severe pain. In bivariate analysis, none of the cancer treatment-related characteristics emerge as significant predictors of severe pain, although participants frequently complain of pain while on cancer treatments.

Finally, the present study discovers a statistically significant association between severe pain and patients who are not perceived with family commitments. However, this aspect has not been reported in previous studies. Moreover, a significant positive correlation between severe pain and those in marriage is found; in contrast to the literature which has reported an insignificant association between marital status and the extent of pain (Parás-Bravo et al. 2017).

The study includes only the associated factors of cancer-related pain, which are measurable in the context of the study and it is identified as a limitation of the study. Therefore, the final logistic regression model explains 5.6% to 8.1% of the variance in having severe pain, suggesting that nearly 9/10 of the variance is left unexplained.

In conclusion, a significant positive correlation is shown between severe pain and males, who are married 'not having family commitments, and pain for over three months duration. Proactive measures are recommended to disseminate findings and raise awareness among the members of pain teams in Sri Lanka with a view to improve patient outcomes. Potential exists for further studies to shed light on the field.

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