

## **2.2.4 The Psychological Dimension**

An estimated 50 percent of cancer patients have normal adjustment to their illness, while the other 50 percent have problems coping with their illness. In many cases, they become anxious or depressed (National Pain Foundation, 2008)

## **2.3 Factors Affecting Cancer Pain**

The prevalence of pain in cancer patients varies with the primary tumor site and with the stage of disease. Different levels of pain were described for patients with different cancer diagnoses. The highest levels of pain are reported by terminally ill patients. Thus, the prevalence of pain in different cancer groups varies, and the results in each group also vary. Many studies report on the prevalence of pain in mixed cancer groups, but these results cannot be used to identify the pain experienced by the various cancer groups separately.

Differences in pain among oncology patients are seldom described in relationship to demographic variables, but the reports that do exist indicate that such variables may be significant. For example, age is such a predictor. In one study, elderly patients reported a significantly lower intensity of pain than younger patients. Another study described a trend for older patients to experience more severe pain. These older patients reported that they were more willing to tolerate pain and perceive less control over their pain.

Paul, Zelman, Meredith and Miaskowski (2004) described women are more likely than men to experience a variety of recurrent pains, and in most studies, women reported more severe levels of pain, more frequent pain, and pain of longer duration than do men. Significant associations between the patients' social life and pain have also been described as pain interferes with work, social activities, and relationships. Patients reported a decrease in social activity because of pain and in most cases the decrease correlated significantly with pain intensity. On the other hand, the socially isolated cancer patient may suffer from pain to a greater extent than the patients who have close contact with his/her family and friends.

Thus, these factors discussed here may determine the level of pain experienced, and there is a need of consideration of these factors in assessing pain reported by the cancer patients.

#### **2.4 Barriers to Adequate Cancer Pain Assessment**

There are few reasons why the pain severity among cancer patients is not properly measured. First is the problems related to health care professionals. Barriers to adequate pain assessment in patients with metastasized cancer include inadequate knowledge of pain assessment and concerns about patient addiction or tolerance. Traditionally, nurses had knowledge deficits in pain assessment, poor pain assessment, and fear of patient addiction, concern about side effects of analgesics and concern about patients becoming tolerant to analgesics (Ferrel & Dean, 1995).

Patient barriers include a reluctance to report pain because of fears that pain is synonymous with disease progression and that escalating opioid doses will lead to addiction or tolerance. These patients also concern about distracting health professionals from treatment of underlying disease, fear that pain means disease is worse and concern about not being a "good" patient. Some patients refuse to take pain medications because they fear of addiction or of being thought of as an addict, worry about unmanageable side effects and concern about becoming tolerant to pain medications (Ferrel & Dean, 1995).

Institutional barriers include the low priority given cancer pain treatment and inadequate reimbursement. The pain experienced by patients with cancer is a frequent dilemma confronting physicians during the diagnosis and treatment of the disease. Indeed, pain is among the most prevalent symptoms reported by cancer patients (Ferrel & Dean, 1995).

## 2.5 Conceptual Framework

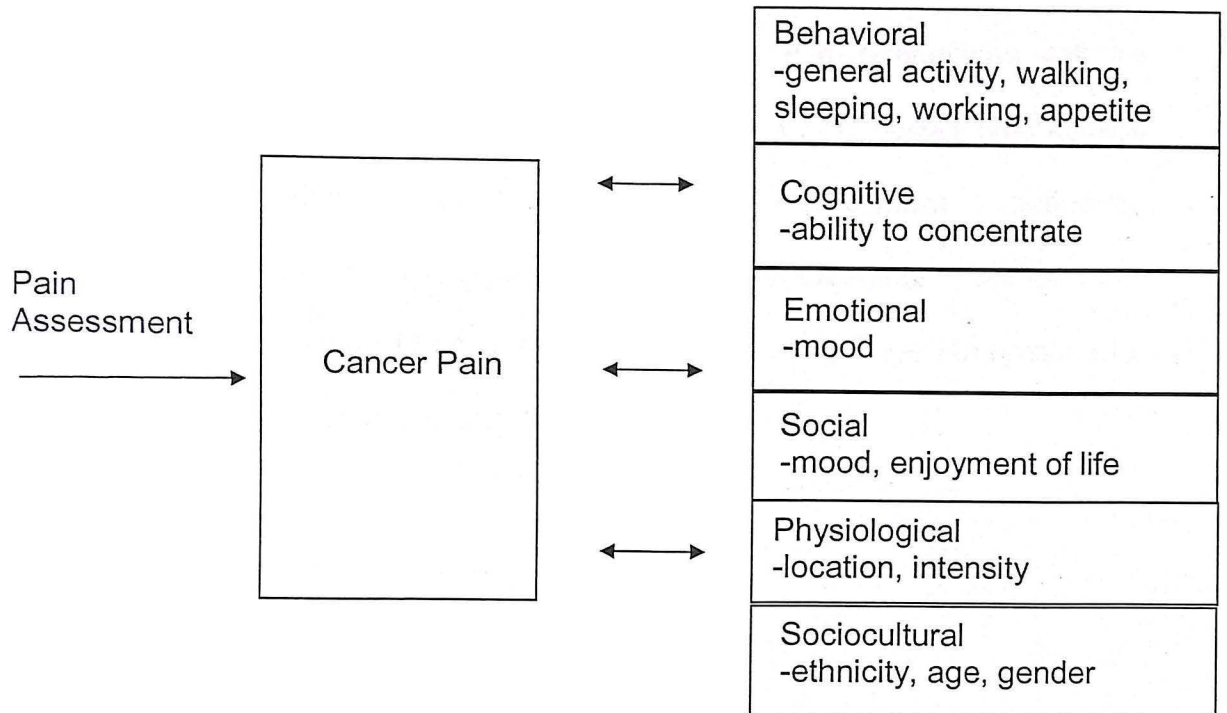


Figure 1.3: Multidimensional Model of Cancer Pain (McGuire, 1992)

In 1992, McGuire had developed the multidimensional model of the cancer pain experience that included 6 dimensions: physiological, social, cognitive, emotions, behavioral and sociocultural. McGuire suggested that the sociocultural dimension of the cancer pain experience included demographic characteristics (eg, age, sex, and race), ethnic background, and cultural, spiritual, religious, and social factors that influence individual's perceptions of and responses to pain. Cultural background is an important aspect of the sociocultural dimension of pain because persons from different cultures perceive and respond to pain in different ways. In addition, how and whether people communicate their pain to healthcare professionals and to others can be influenced by cultural factors.

Other than that, the other dimensions of cancer pain will also contribute and influence cancer pain experienced by patients. These dimensions will be experience by the patients as physically and verbalize to the nurses who assess the pain severity of the cancer patients. Effective pain assessment can influence patients' use of pharmacological and nonpharmacological interventions. Therefore, cancer pain should be assessed by considering these dimensions for more effective cancer pain treatment (McGuire, 1992).

## CHAPTER 3: RESEARCH METHODOLOGY

### 3.1 Research Design

This is a cross-sectional and descriptive study to determine the pain severity among metastasized cancer patients in Hospital Universiti Sains Malaysia (HUSM) Kelantan.

### 3.2 Population and Setting

The target population in this study is the metastasized cancer patients at Oncology Clinic and Oncology Ward HUSM Kelantan.

### 3.3 Sample

#### 3.3.1 Sample Size

The sample size of my study had been calculated using Single

Mean Formula:

$$n = z \left( \frac{SD}{\Delta} \right)^2$$

Where by,

N=sample size

Z=1.96 for 95% Confidence Interval

SD=2.6 (Holtan *et. al*, 2007)

$\Delta = 0.25$

$$N = \frac{(1.96)(2.6)^2}{0.25}$$

N = 415 + 10% dropout rate

N = 455

The sample size in my study calculated was 445 respondents.

Unfortunately, due to time limitation for data collection, I only manage to collect 65 respondents from Oncology Clinic and Oncology Ward HUSM.

### **3.3.2 Sampling Design**

The study is a convenience sampling and the patients had been diagnosed metastasized cancers at stage III and IV who had met the inclusion criteria and were undergoing treatment in Oncology Ward and Oncology Clinic HUSM from 28 February 2009 until the middle of March 2009.

### **3.3.3 Inclusion Criteria**

The inclusion criteria for patients in this study were:

Patient who:

- is diagnosed with cancer at stage III and IV (metastasized cancer) who has experienced pain and reporting having pain during the past 24 hours.
- is able to read, write and understand Bahasa Malaysia
- is 18 years and above

- is willing to participate
- has no other causes of pain, (eg: chest pain due to myocardial infarction)

### **3.3.4 Exclusion Criteria**

The exclusion criteria for patients in this study were:

Patient who:

- is below 18 years old
- is drug addicted/ drug tolerance
- is diagnosed as mentally ill patient
- is post-operative patient.

## **3.4 Instrumentation**

### **3.4.1 Instrument and variables measurement**

This study uses two instruments for the data collection: The first instrument consists of socio-demographic and clinical data, and the second instrument is Brief Pain Inventory (BPI).

The instrument of socio-demographic data is to gather information related to patients' socio-demographic characteristics, which are age, gender, ethnicity, marital status, occupational and education level. The clinical data consists of type of cancer, stage of cancer, length of time since diagnosis, previous cancer treatment and any medications taken (Appendix B).

The second instrument is Brief Pain Inventory (BPI) Questionnaires from the Pain Research Group, Department of Neurology, University of Wisconsin-Madison (Daut & Cleeland, 1983) (Appendix C). The Brief Pain Inventory provides information on pain history, intensity, location, quality, and impact on quality of life. BPI is a self-report instrument which includes: a body diagram, four measures of pain intensity ('pain worst', 'pain least', 'pain average', and 'pain now') rated on a 0-10 numeric scale, an item measuring pain relief in percentage, and seven items measuring interference with general activity, mood, walking, working, relations with others, sleeping, and enjoyment of life (Daut & Cleeland, 1983).

The BPI uses 0 to 10 numeric rating scales (NRS) for item rating because of its simplicity, lack of ambiguity and seemed the best to use for cross-linguistic pain measurement. Since pain can be quite variable over a day, the BPI asks patients to rate their pain at the time of responding to the questionnaire (pain now), and also at its worst, least, and average over last 24 hours. The pain worst rating can be chosen to be the primary response variable, with the other items serving as a check on variability, or, alternatively, these ratings can be combined to give a composite index of pain severity. As effective intervention for pain control should demonstrate its effectiveness on more than a reduction in pain intensity alone.

This BPI also mean other pain dimension such as mood, walking and other physical activity, work, social activity, relations with others, and sleep. This is done using numeric '0' to '10' scales, with '0' being "no interference" and '10' being "interferes completely". The mean of these scores will be used as a pain interference score. BPI has no scoring algorithm, but "worst pain" or the arithmetic mean of the 4 severity items can be used as measures of pain severity and the arithmetic mean of the 7 interference items can be used a as a measure of pain interference. On the BPI, mild pain is defined as a worst pain score of 1 - 4, moderate pain is defined as a worst pain score of 5 - 6, and severe pain is defined as a worst pain score of 7 - 10 (Holtan *et. al*, 2007). In previous cancer pain studies, it was possible to define 'significant pain' as pain that is rated at 5 or above on a scale of 0-10. It is at this point that patients report substantially more interference with their function (Cleeland & Syrjala, 1992).

#### **3.4.2 Translation of Instrument**

The BPI has been translated to Bahasa Malaysia by the previous researcher in Nuclear Medicine Department HUSM, Kelantan (Nuclear Medicine Department HUSM, 2008).

### **3.4.3 Validity**

The instrument has known reliability and validity and has been used in numerous studies of cancer-related pain internationally. It has been selected by the Cancer Pain Relief Unit of the WHO as an index of the effectiveness of cancer pain relief programs. The BPI has been validated in more than 25 different languages by examining the consistency of its two-factor structure (factors: severity of pain and impact of pain) (Holtan *et al.*, 2007).

### **3.4.4 Reliability**

The internal consistency was tested by Cronbach's alpha, for the pain severity scale. A group of 20 respondents who had met the inclusion criteria had joined the pilot study. As the result, the Cronbach's alpha for this study is 0.81 which is reliable. Cronbach's alpha reliability ranges from 0.77 to 0.91 which means that the instrument is reliable for this study (Holtan *et al.*, 2007).

### **3.5 Ethical Consideration**

The ethical issues that are concern in this research are privacy and confidentiality. The patient's identity in questionnaires will not be mentioned to protect the respondent's rights in personal identity. Researcher must not reveal the respondent's identity to protect them from unauthorized observer.

Another ethical issue is voluntary participation of the patients. Patients have the right to refuse giving respond in the research. The researcher will inform the patients about the researcher identity before getting the permission to participate in the study.

If the patients feel uncomfortable, fatigue, drowsy due to cancer pain or treatment during process of data collection, the researcher will ask the patient to stop and continue with data collection after the patients feel more comfortable and pain relieving.

### **3.6 Data Collection Method**

Before proceed on data collection, this study had obtained the approval from the Ethics and Research Board HUSM. After the ethics approval, consent from Hospital Universiti Sains Malaysia to conduct the study in HUSM had been approved. As the study involved the Oncology Ward and Oncology Clinic HUSM, permission from the Director of Head Department of Nuclear Medicine and Head Department of Oncology Ward HUSM had been obtained. Also, permission from Sisters and other health staffs of Oncology Ward and Oncology Clinic were necessary before proceed on data collection.

After all the approvals, potential patients who met the inclusion and exclusion criteria of the study had to be identified. Then, written consent had to be obtained after explaining to them the purpose and procedure of the research. The instruments (BPI questionnaires) were distributed to the patient who met the inclusion criteria and who had willing to participate voluntary in the study. The instruments took approximately 10 to 15 minutes to be answered by patients. Then, the instruments were collected back after the patients had completed the instruments. During this time, all particulars in the instruments were rechecked by the researcher to ensure that data were correctly filled. The data collection is summarized as in Figure 3.1: Flow Chart of Data Collection.

### 3.6.1 Flow Chart of Data Collection

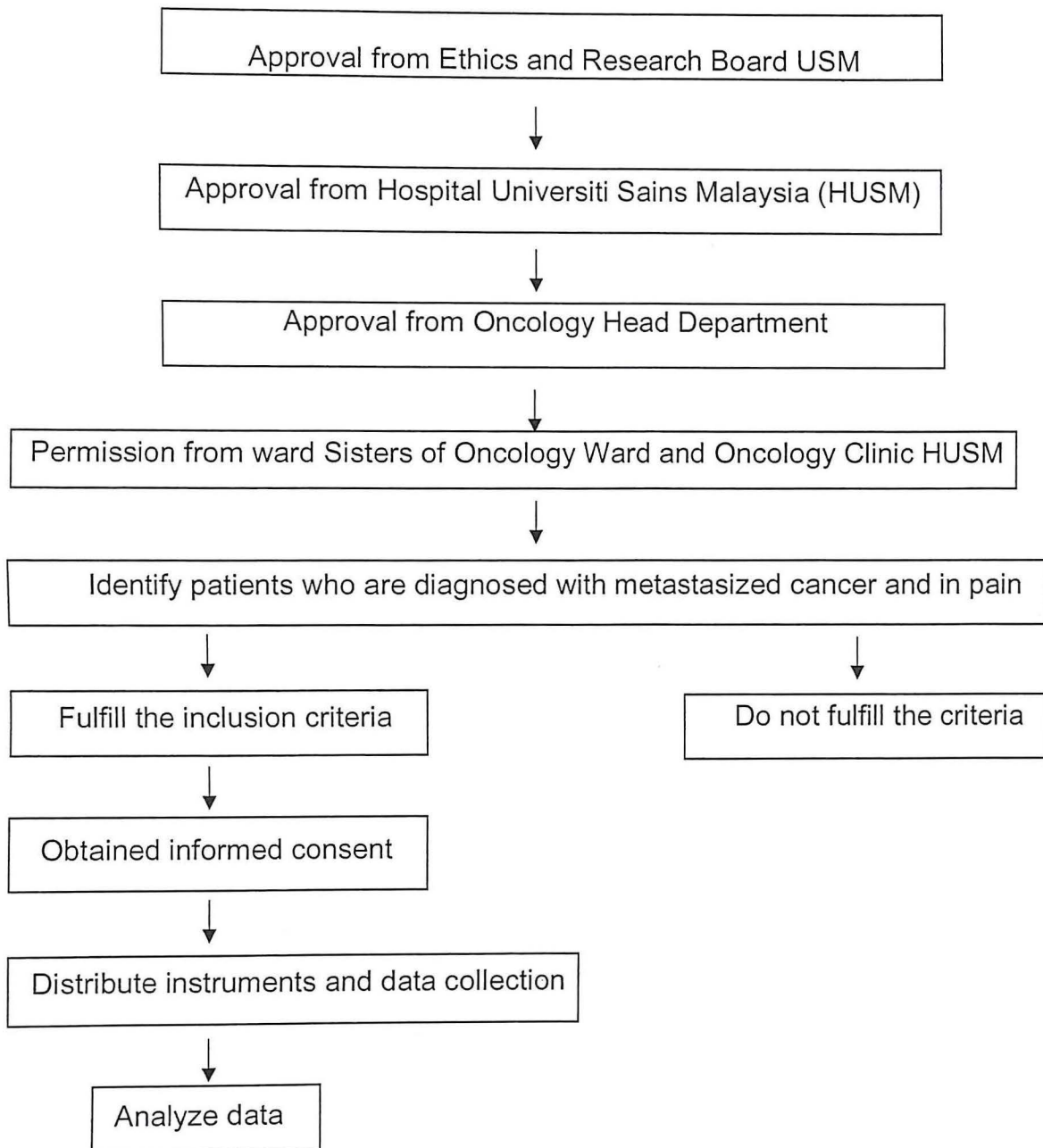


Figure 3.1: Flow Chart of Data Collection

### **3.7 Data Analysis**

The collected data had been analyzed using Statistical Package Social Science (SPSS) version 12.0. Descriptive analysis had been used to describe pain severity in 24 hours by comparing mean score, standard deviation and percentage of now pain, and worst pain, average pain and least pain. Interference items also had been analyzed by descriptive statistics to compare the mean, standard deviation and percentage to know generally the most pain-interfered life components or variables.

Chi square test and Fisher's Exact test had been used to analyze the association between sociodemographic data and clinical data with pain severity among metastasized cancer patients in Oncology Clinic and Oncology Ward HUSM ( $p>0.05$ )

## CHAPTER 4

### RESULTS

#### 4.1 Sociodemographic data

In this study, sociodemographic data consist of age, gender, ethnicity, marital status, and occupation status. The data were generated in order to describe sample. A total of 65 respondents from Oncology Clinic and Oncology Ward HUSM who had met the inclusion criteria were involved in this study voluntarily. The mean age of the respondents is 50.45, ranging from a minimum of 18 and maximum of 73 years old. Table 4.1.1 show the mean and standard deviation of age. Among the respondents involved, the elderly respondents who are 60 years old and above are 27.7% while 72.3% are adults aged from 18 to 59 years old. The respondents also consist of 58.5% female and 41.5% male. Malay constituted of 83.1% among all of the respondents while the Chinese are only 16.9%. There are no other ethnic involved in the study even subjects were chosen randomly in the Oncology Clinic and Oncology Ward HUSM. Among all the respondents, 78.5% of them still lived with their life partners or had married while 21.5% of them live alone or unmarried yet (this includes 0.8% unmarried, 6.2% are widows while 4.6% had separated by death or divorced). Working respondents constituted 47.7% of the respondents, 32.3% not working and 20% are pensioners. Table 4.1.2 summarizes the descriptive statistics of sociodemographic data of all the 65 respondents who were involved in the study.

Table 4.1.1: Mean and Standard Deviation of age variable, (n=65)

Sociodemographic data	Minimum	Maximum	Mean (SD)
Age	18	73	50.45(14.258)

Table 4.1.2: Frequency and percentage of patient sociodemographic data (n=65)

Sociodemographic data	Frequency	Percentage (%)	
Age	< 59 years old	47	72.3
	> 60 years old	18	27.7
Gender	Female	38	58.5
	Male	27	41.5
Ethnicity	Malay	54	83.1
	Chinese	11	16.9
Marital status	Unmarried	7	10.8
	Married	51	78.5
	Widow	4	6.2
	Divorced/Separated	3	4.6
Occupation	Not working	21	32.3
	Working	31	47.7
	Pensioner	13	20

## 4.2 Clinical data

From the study, the highest percentage of cancer in HUSM is breast cancer, which is 32.3%, followed by lung cancer 13.8% and colorectal cancer 12.3%. Colorectal cancer in this study includes colon cancer and rectal cancer. About 10.8% of the respondents suffered osteosarcoma, while ovarian cancer and cervix cancer is 9.2% and 6.2% each. Head and neck cancer consist of 4.6% of the cancer types, same percentage as hematological cancer and urinary system cancer. Urinary system cancer in the study includes periampular cancer and bladder cancer. The lowest percentage is testis cancer, which is 1.6%. The stage of cancer in this study is only stage III and IV. Stage III cancer patients

consist of 50.8% and cancer stage IV is 49.2%. 52.3% of the respondents reported had not given analgesic to relieve their pain while 47.7% respondents were given analgesic as pharmacological treatment. The common analgesic prescription for the patients is Tramal, Arcoxia, Celecoxib, Morphine and Paracetamol. The types of treatment experienced by the respondents are chemotherapy, radiotherapy and surgery. Among of 65 respondents, 92.3% of them had undergone chemotherapy. 49.2% of the cancer patients also had experienced radiotherapy and 56.9% from total of respondents had undergone surgery. Table 4.2.1 below shows the frequency and percentage of the clinical data.

Table 4.2.1: Frequency and percentage of clinical data (n=65)

<b>Clinical data</b>	<b>Frequency</b>	<b>Percentage (%)</b>
Cancer type		
Breast	21	32.3
Lung	9	13.8
Colorectal	8	12.3
Osteosarcoma	8	12.3
Ovarian	6	9.2
Cervix	4	6.2
Head and neck	3	4.6
Hemato	3	4.6
Urinary system	3	4.6
Cancer stage		
III	33	50.8
IV	32	49.2
Analgesic		
Not given	34	52.3
Given	31	47.7
Treatment		
Chemotherapy	60	92.3
Radiotherapy	32	49.2
Surgery	37	50.8

### 4.3 Pain severity and Interference items

Generally, the mean of total pain score for 4 severity items in the questionnaires is 6.14, ranging from 0 to 25. This can be seen in Table 4.3.1. The highest mean score is the worst pain experienced in 24 hours (mean= 3.12). The mean of least pain experienced in 24 hours is 1.4 while the mean for average pain experienced in 24 hours is 1.05. The lowest mean score for the pain severity experienced in 24 hours is now pain that is pain during interview (mean=0.6). Table 4.3.2 shows the mean score and standard deviation of pain severity in 24 hours.

Table 4.3.1: Mean and standard deviation of total pain score, (n=65)

	Minimum	Maximum	Mean (SD)
Total pain score	0	25	6.14(6.090)

Table 4.3.2: Mean and standard deviation of pain severity in 24 hours, (n=65)

Pain Severity Items In 24 hours	Mean(SD)
Worst	3.12(2.92)
Least	1.4(1.5)
Average	1.05(1.2)
Now Pain	0.61(1.11)

From the descriptive statistic, most of the respondents reported experienced worst pain, least pain and average pain in 24 hours as mild pain. But, for now pain (pain during interview), 63.1% of the respondents experienced no pain at all. Table 4.3.3 shows the frequency and percentage of pain severity in 24 hours.

Table 4.3.3: Frequency and percentage of pain severity items in 24 hours, (n=65)

<b>Pain items</b>	<b>Frequency</b>	<b>Percent</b>
<b>Worst pain</b>		
no pain	12	18.5
mild	34	52.3
moderate	5	7.7
strong	14	21.5
<b>Least pain</b>		
no pain	22	33.8
mild	38	58.5
moderate	5	7.7
strong	0	0
<b>Average pain</b>		
no pain	25	38.5
mild	39	60.0
moderate	1	1.5
strong	0	0
<b>Now pain</b>		
no pain	41	63.1
mild	22	33.8
moderate	2	3.1
strong	0	0

The most interfered life components by pain or life component with the highest mean score is enjoyment in life (mean = 5.94). This is followed by mood disturbance (mean= 4.12) and general activity disturbance (mean = 3.32). However, pain interfered with walking ability (mean=2.09) and working are the least interfered components (mean=2.29). The mean and standard deviation of pain severity interference items are listed in Table 4.3.4

Table 4.3.4: Mean and standard deviation of pain interference items, (n=65)

<b>Interference items</b>	<b>Mean</b>	<b>SD</b>
Enjoy	5.94	2.46
Mood	4.12	2.45
General activity	3.40	2.99
Relationship with others	3.32	2.64
Sleeping	2.72	3.29
Working	2.29	2.77
Walking	2.09	3.47

\*Scale 0 (no interference)-10 (complete interference)

#### **4.4 The significant association between socio-demographic and clinical data with pain severity among metastasized cancer patients in HUSM.**

During data analysis, the researcher had categorized the pain severity into 2 groups, which is significant pain and not significant pain. The significant pain is when the respondents rate their worst pain in 24 hours from 5 to 10 while the not significant pain is when the respondents rate their worst pain in 24 hours from 1 to 4. The sociodemographic data measured in this study are age, gender, ethnicity, marital status and occupational status.

From the data, 84.2% adult patients aged 18 to 59 years had reported significant pain while 15.8% of elderly reported significant cancer pain. 36.8% female reported had experienced the significant pain while the male are only 18.5%. About 31.5% of the Malays reported to experience significant pain while the Chinese are only 18.2%. For marital status, 50% of the unmarried experienced significant pain, while 23.5% married respondents had significant pain. For occupational status, 32.4% of the respondents who are not working

(includes students and pensioners) had experienced significant pain, while only 25.5% of working respondents reported significant pain.

By using Chi square test, the  $p$  value for all of the sociodemographic data is more than 0.05, which means this is not significant to reject null hypothesis. Thus, null hypothesis is accepted. So, there is no significant difference between pain severity and sociodemographic data (age, gender, ethnic, marital status and occupational status). Table 4.4.1 show the association between demographic variables and pain severity.

Table 4.4.1: The significant association between sociodemographic variables and pain severity, (n=65)

Sociodemographic variables	Pain severity, n (100%)		Chi square value	df	$p$ value
	Not significant (less than 4)	Significant (more than 5)			
Age					
Elderly	15(32.6)	3(15.8)	1.90	1	0.168
Adult	31(67.4)	16(84.2)			
Gender					
Female	24(63.2)	14(36.8)	2.56	1	0.109
Male	22(81.5)	5(18.5)			
Ethnic					
Malay	37(68.5)	17(31.5)	0.79	1	0.491
Chinese	9(81.8)	2(18.2)			
Marital status					
Married	39(76.5)	12(23.5)	3.72	1	0.094
Unmarried	7(50)	7(50)			
Occupation					
Working	23(74.2)	8(25.5)	0.34	1	0.561
Not working	23(67.6)	11(32.4)			

It is also important to determine the association between pain severity and clinical data. The clinical data in this study are cancer stage, analgesic prescription, chemotherapy, surgery and radiotherapy. After analyzing clinical data using Chi square test, the p value for cancer stage, chemotherapy, surgery and radiotherapy are more than 0.05 which means null hypothesis were accepted. Thus, there is no significant association between pain severity and clinical data (stage, chemotherapy, surgery and radiotherapy). But, only one of the clinical data variable had p value<0.05, which is analgesic prescription. Thus, it is significant to reject null hypothesis. There is a significant association between pain severity and analgesic prescription.

From the analyzed data, 31.2% of respondents with cancer stage IV experienced higher significant pain while 27.3% of respondents who suffered cancer stage III had significant pain. 51.6% of the respondents still suffer significant pain although analgesic was prescribed. 30 % of the respondents who had undergone chemotherapy had reported significant pain, 24.3% who had undergone surgery reported significant pain while 31.3% who had undergone radiotherapy reported significant pain. Table 4.4.2 show the association between pain severity and clinical data.

Table 4.4.2: The association between pain severity and clinical data, (n=65)

Clinical data	Pain severity, n (100%)		Chi square value	df	P value
	Not significant (less than 4)	Significant (more than 5)			
Cancer Stage					
III	24(72.7)	9(27.3)	0.12	1	0.724
IV	22(68.8)	10(31.2)			
Analgesic					
Given	15(48.4)	16(51.6)	14.35	1	<b>0.000</b>
Not given	31(91.2)	3(8.8)			
Chemotherapy					
Done	42(70.0)	18(30.0)	0.223	1	1.000
Not done	4(80.0)	1(20.0)			
Surgery					
Done	28(75.7)	9(24.3)	1.000	1	0.317
Not done	18(64.3)	10(35.7)			
Radiotherapy					
Done	23(68.8)	9(31.3)	0.124	1	0.724
Not done	24(72.7)	9(27.3)			

## CHAPTER 5

### DISCUSSIONS

#### 5.1 Pain severity and pain interference among metastasized cancer patients in HUSM

Taking into account of the mean pain score in this study, it is apparent that management of pain was quite sufficient for the respondents. Prevalence of pain reported by the respondents in my study majority reported to have mild to moderate pain in mean score. The findings are similar to study done by Wells N. (2003). The most interfered life activities components or the highest mean pain score is life enjoyment followed by mood, general activities and relationship with others.

The mean score for life enjoyment in the study is 5.94, which is almost similar to study by Holtan *et al.* (2007) with the mean of 6.1. This is because interference with enjoyment of life is greatest when pain is caused by cancer, intermediate when caused by unknown factors and least when seen as caused by treatment. Unrelieved pain can be substantial enough to disturb affect and impair function (Portenoy *et al.*, 1997). Mood is the second most interfered by cancer pain (mean=4.12). The unrelieved cancer pain is associated with disturbances in mood that rises steadily as pain severity increases. In some cases, pain contributes to a hopelessness and depressed mood until that the wish for hastened death appears (Holtan *et al.*, 2007).

General activities is the third most interfered by cancer pain (mean=3.4). This is because pain also can interfere with physical functioning and cause interference in general activity. Relationship with others also had reported cancer pain (mean=3.32). Patients reported a decrease in social activity because of pain and in most cases the decrease significantly with pain intensity. This is because the socially isolated cancer patient may suffer from pain to a greater extent than the patients who have close contact with his/her family and friends. Pain affects more than the person who is in pain, it also has an impact on his or her entire family or support system. Pain creates stress within the family by becoming a physical as well as a financial burden. It can interrupt relationships and intimacy as the interaction with loved ones changes (Holtan *et al.*, 2007). This is why the cancer patients in this study reported a decrease in relationship with others because of cancer related pain.

## **5.2 Sociodemographic data explanation**

From the descriptive statistic, the highest percentage of respondents reported to have significant pain for each of sociodemographic variables are adult aged 18 to 59 years old (84.2%), female gender (36.8%), Malay (31.5%), unmarried (50%) and not working (32.4%).

Higher percentage of non elderly aged 18-59 years old reported to experienced significant pain than elderly. Study conducted by Rustoen, Fossa, Skarstein and Moum (2003) explained that this is because elderly tolerate to pain more than younger patients and they can control over their pain well.

Female reported higher frequency than the males because women more often and openly talk about their pain with friends and health care providers than males. Male are less willing to express their pain-related distress and strain (Patistea & Vardaki, 2001). Paul *et al.* (2004) described women are more likely than men to experience a variety of recurrent pains, and in most studies, women report more severe levels of pain, more frequent pain, and pain of longer duration than do men.

Malays respondents reported higher percentage of significant pain due to their majority population in Kelantan, compare to any other ethnics in Peninsular Malaysia.

Not working respondents' percentage who reported significant pain is higher than percentage of those who are working. This is because the patients on disability pensions, sick leave, and old-age pensions had significantly more pain compared with the patients working. Pain also can interrupt employment (Holtan *et. al*, 2007).

### **5.3 The association between sociodemographic data with pain severity among metastasized cancer patients in HUSM**

Generally, the study shows the pain prevalence of 65 cancer patients who had experienced metastasized cancer in Oncology Clinic and Oncology Ward HUSM. The mean age of the respondents is 50.45 which is still a group of reproductive adults. 47.7% of the respondents are still working. The variation of ethnicity cannot be achieved because majority of the Kelantanese are Malays.

Among all of the respondents, 78.5% had married whereas 21.5% lived alone without partners or unmarried yet.

From the data analysis, there is no significant association between pain and age. This is similar with study conducted by Beuken *et al.* 2007. According to Beuken *et al.*, (2007), age is not necessary associated with the larger number of symptoms in patient with cancer and the literature on age and cancer pain is scarce and conflicting. Several studies suggest that cancer pain is less prevalent with increased age; but clearly influenced by the site of the cancer, the extent of the disease, and presence of bone metastasis (Portenoy *et al.*, 1997).

From the data analysis, it is found that there is no significant difference between pain and gender. Male and female reported to experience pain. This study result is similar with study done by Rustoen *et al.* (2003) that he also concludes that there is no significant difference between pain and gender. Generally, women are more likely than men to experience a variety of recurrent pains, and in most studies, women report more severe levels of pain, more frequent pain, and pain of longer duration than do men. But, there was no significant difference between gender and pain severity among cancer because patients with metastatic bone pain concluded that no clear sex differences could be detected (Rustoen *et al.*, 2003).

The result also shows that there is no significant difference between pain severity and ethnicity. Although majority of the respondents are Malays, this does not have to with pain severity. The most significant causes is the types of cancer, where it metastasized and patient who had undergone chemotherapy.

Occupation was also found to have no significant association to the subjects' severity of pain. This is similar to study done by Pantelli and Pantistea (2007).

#### **5.4 The association between clinical data with pain severity among metastasized cancer patients in HUSM**

From the data analysis, it was found that there is no significant association between cancer types, cancer stage and treatment with pain severity ( $p$ -value > 0.05).

In this study, it was found that there is no significant association between cancer types and pain severity. In this study, osteosarcoma patients reported the highest mean pain score. This result is similar with study done by Brescia et al., (1990). In this study, majority of the respondents suffered breast cancer (32.3%). Patients with advanced breast cancer reported that it is not painful, except there is evidence of bone metastasized (Liang B., 2001). Thus, this had influenced the result findings of this study.

In this study, it was also found that there is no significant association between cancer stage and pain severity. According to Liang (2001), advanced cancer would likely to increase risk of experiencing pain. In this study, there is no significant difference because majority of the respondents reported area of metastasized is liver. Patient who had evidence of bone metastasized experience significant pain that can impair physical and physiological functioning (Liang B.,

2001). Thus, these patients do not feel significant pain although having advanced cancer stage.

Although we had strong clinical impression that tumor shrinkage is generally associated with relief of pain, but multidimensional cancer pain theory had mentioned that pain expression is influenced by multidimensional factors. According to Cherny (2000), cancer treatments such as chemotherapy, radiotherapy and surgery can be painful and have some side effects that might worsen the patients' condition. But, these patients demonstrate a clearly favorable balance between relief and adverse effects (Cherny N., 2000). These patients can cope with the pain and perceived the adverse effects not a significant pain. This is related to psychological and cultural dimensions of Multidimensional Cancer Pain Theory (McGuire, 1992).

In this study, it was found that there is a significant association between analgesic prescription and pain severity. This is because these patients wait until pain was moderate or severe before requesting more medication, even though they acknowledged that they should ask for relief when their pain was milder (Cleeland, 1992). Patients are concerns about addiction and other side effects (such as mental confusion and increased tolerance) were strongly associated with reports of reluctance to report pain and willingness to experience pain rather than to take analgesics (Cleeland, 1992)

## CHAPTER 6

### CONCLUSION AND RECOMMENDATION

#### 6.1 Summary of the study findings

A more realistic goal of cancer pain treatment is to optimize pain relief and for patient more functional in their daily activities. Multidisciplinary effort in cancer care is essential in metastasis and advanced disease. The roles of various specialists have been recognized in different clinical situations. Despite the clear WHO recommendation, cancer pain is still a major problem.

The measurement of pain in patients with cancer is a complex process. The subjective and multidimensional nature of pain requires careful consideration in choosing an appropriate instrument. Prior determination of the dimensions to be measured and the ability and willingness of the patient to provide information must be assessed.

This study was conducted to determine the pain severity among metastasized cancer patients in Oncology Clinic and Oncology Ward Hospital Universiti Sains Malaysia. A total of 65 respondents who had met the inclusion criteria had involved voluntarily in this study. Using descriptive statistic by comparing mean pain score, the highest mean pain score is among the adults aged 18 to 59 years old, female patients, Malay ethnicity, unmarried or not living with life partners and not working patients. The most interfered components of life are enjoyment of life, followed by mood disturbance, general activity

disturbance and relationship with others. By using Chi square and Fisher's Exact test, there is no significant association between sociodemographic data and pain severity. There is also no significant association between clinical data (cancer stage, chemotherapy, radiotherapy and surgery treatment) with pain severity. But there is a significant association between pain severity and analgesic prescription.

Measurement of functional status should be attempted to determine the effects of pain on the patient's life. A more sensitive measure of functional status may be chosen by considering global measures, disease-specific measures, or symptom-specific measures, along with other characteristics of patient populations. Each component of the measurement process is important in developing an accurate and comprehensive assessment of cancer pain. The most important issue, however, in the measurement of pain is consistency. For pain to be evaluated and treated effectively, regular assessment of pain is imperative (Vallerand, 1997).

Nurses are the primary health professionals for patients in pain and their family caregivers. Nursing interventions that assist patients in deriving some kind of positive meaning from pain and suffering are essential to helping these individuals live with advancing disease and experiencing a peaceful death (Ferrell and Dean, 1995).

## **6.2 Strength and limitations**

The study on pain will contribute to a more comprehensive non pharmacological treatment for metastasize cancer patients in Malaysia. This study also had showed us generally the mean pain score among metastasize cancer patients and the association of pain severity with sociodemographic and clinical data. The instrument also is a quick and easy tool for pain assessment and had been translated to Bahasa Melayu for easier understanding to the social community in Kelantan. The researcher also was all the time with the respondents during data collection so the respondents have more understanding on the instruments.

One of the limitations in the study is small sample size due to limitation of time. Then, there are some of the respondents who refused to participate in the study due to cancer pain and treatment pain. Limitation of using the BPI is that the instrument does not differentiate between disease related and treatment related pain. For some groups of patients, the pain is mostly related to therapy, as in patients with head and neck cancer receiving curative irradiation. Furthermore, a 24 hours prevalence study will not capture the dynamic nature of pain. This study also did not take into account the length of time the patient had been admitted to the hospital.

## **6.3 Implications and Recommendation**

### **6.3.1 Nursing Practice**

For nursing practice, the findings will provide great knowledge and awareness of pain severity as experienced by the metastasized cancer patients. With this awareness and knowledge, nurses will be more motivated to plan ahead effective assessment and care to manage patients with cancer pain. Nurses will be more sensitized to a more attentive and comprehensive attitude toward the patient's overall experience of cancer pain. Thus, nurses organized their time to devote attention specifically to pain just as much as to other primary nursing activities. The communication among nurses and communication between nurses and physicians also can be improved as the nurses noted the cancer pain to the doctors and they will review back the treatment for these patients.

### **6.3.2 Nursing Education**

For nursing education, this study will provide knowledge in clinical reasoning in delivering care towards patients with cancer pain. This study will help for future curriculum in the pain assessment for cancer patients. Nurses had chance to know and use specific pain documentation and assessment tools and understand the importance and necessity in pain management.

The researcher suggested for having curriculum for palliative care as a component of any nursing educational initiative.

### **6.3.3 Nursing Research**

For nursing research, the finding of this study also will add to a body of accumulated knowledge which is evidence-based related to assessment of pain severity among metastasized cancer patient.

As pain is a complex phenomenon, the researcher suggested that nurses should ideally use a range of items to measure it if nurses aim to grasp how it interferes with other areas of life. Another often overlooked fact is that cancer pain can be intermittent. Thus to obtain a true picture of the pain experienced by these patients, the researcher suggests that more than one measurement should be performed. For future research, the analgesics used by the patients also should be described in future studies.

### **6.3.4 Implications to Cancer Pain Multidimensional Theory**

The researcher found out that multidimensional cancer pain theory by McGuire is very useful in explaining the factors of cancer pain. The 6 dimensions that affecting cancer pain experience included behavioral, cognitive, emotional, social, physiological and sociocultural.

Variables or dimensions of demographic characteristics (eg, age, sex, and race), ethnic background, and cultural, spiritual, religious, and social factors that influence individual's perceptions of and responses to pain. Cultural background is an important aspect of the sociocultural dimension of pain because persons from different cultures perceive and respond to pain in different ways. In addition, how and whether people communicate their pain to healthcare professionals and

to others can be influenced by multidimensional factors. This is also had influenced the findings in the result.

Other study regarding the relationship of another life dimension can influence cancer pain in cancer patients can be conducted based on the Cancer Pain Multidimensional Theory by McGuire (1992)

## REFERENCES

### Books:

Bonica J. J. (1990). *The Management of Pain* (Philadelphia Lea & Febiger ed) 2<sup>nd</sup> edn pg 14

Smeltzer S.C. and Bare B.(2004). *Textbook of Medical-Surgical Nursing*. (Lippincolt Williams & Wilkins ed)10<sup>th</sup> edn. pg 1145

### Journals:

Beck S. L., and Falkson G. (2001). Prevalence and management of cancer pain in South Africa: *Pain* **94** pg 75–84

Beuken V.D, Rijke J. M., Kessels A. G., . Schouten H. C, Kleef M. V. and Patijn J. (2007). Prevalence of pain in patients with cancer: a systematic review of the past 40 years. *Annals of Oncology* **18(5)**:1437–1449

Bryan A. L. (2001). Assessment and management Hospital Physician. *Pain in Advanced Cancer*. 5 9 – 7 1

Cheng K. F., Thompson D. R., Ling W.M. and Chan W.H. (2005). Measuring symptom prevalence, severity and distress of cancer survivors. *Clinical Effectiveness in Nursing*. **9**: 154–160

Cleeland C.S. and Syrjala K.L. (1992). How to assess cancer pain in Turk DC, Melzack R(eds): *Handbook of Pain Assessment*. 362-387

Daut R. L. and Cleeland C. S. (1983). The Prevalence and Severity of Pain in Cancer. *Cancer* **50**: 1913-1918

Ferrell B. R. and Dean G. (1995). The meaning of cancer pain. *Seminars in Oncology Nursing*. **11(1)**: 17-2

Fortner B.V., Okon T. A., Ashley J., Kepler G., Chavez J., Tauer K., Thompson M., Lee S., Demarco G., and Houts A. C. (2003). The Zero Acceptance of Pain (ZAP): Evaluation of pain severity, pain interference, global quality of life, and pain-related costs. *Journal of Pain and Symptom Management*. **25(4)**

Higginson I. J. and Wei G. (2008). Caregiver assessment of patients with advanced cancer: concordance with patients, effect of burden and positivity. *Health and Quality of Life Outcomes*. **6(42)**

Holley S., McMillan S.C., Hagan S. J., Palacios P. and Rosenberg D. (2005). Pain resource nurses: Believing the patients, believing in themselves: *Oncology Nursing Forum*. **32(4)**: 843

Holtan A., Aass N., Nordoy T., Haugen D. F., Kaala S., Mohr W., Kongsgaard U. E. (2007). Prevalence of pain in hospitalised cancer patients in Norway: a national survey. *Palliative Medicine*. **21**: 7-13

Koffman J., Higginson I. J. and Donaldson N. (2003). Symptom severity in advanced cancer, assessed in two ethnic groups by interviews with bereaved family members and friends. *Journal of the Royal Society of Medicine*, **96(1)**:10

Lim G. C. (2002). Overview of Cancer in Malaysia. *Japanese Journal of Clinical Oncology* **32**:S37-S42

Mark M. G., Dobrina R., Crudele M., Tonini G. and Santini D. (2000). Nursing assessment of pain in cancer patients: a pilot study: *European Journal Oncology*. **5(1)**: 49-52

McGuire D. (1992). Comprehensive and multidimensional assessment and measurement of pain. *Journal of Pain and Symptom Management*. **7(5)**: 312-319.

Pantelia V. and Patistea E. (2007). Assessing patients' satisfaction and intensity of pain as outcomes in the management of cancer-related pain. *European Journal of Oncology Nursing*. **11(7)**: 424–433

Paul S. M., Zelman D. C., Meredith Smith M., Miaskowski C (2005). Categorizing the severity of cancer pain: further exploration of the establishment of cutpoints. *Pain*. **113**: 37-44

Portenoy R.K., Thaler H.T., and Korublith A.B. (1997). The memorial symptom assessment scale: An instrument for the evaluation of symptom prevalence, characteristics, and distress. *European Journal Cancer* **30A**:1326-1336

Saxena A., Mendoza T. and Cleeland C. S. (1999). The assessment of cancer pain in North India: the validation of the Hindi Brief Pain Inventory—BPI-H. *Journal of Pain and Symptom Management*. **17 (1)**

Serlin R. C., Mendoza T. and Nakamura Y. (1995). When is cancer pain mild, moderate or severe? Grading pain severity by its interference with function: *Pain*. **6(1)**: 277-284

Rustoen T., Fossa S. D., Skarstein J., and Moum T., (2003). The impact of demographic and disease-specific variables on pain in cancer patients. *Journal of Pain and Symptom Management*. **26(2)**

Turk D. C., Okifuji A., Miner M. F., Florio G., Harrison P., Massey J., Lema M. L. and Zevon M. A. (1998). Adaptation to metastatic cancer pain, regional/local cancer pain and non-cancer pain: role of psychological and behavioral factors. *Pain*. **74(2-3)**: 47-256

Vallerand A. V. (1997). Measurement Issues in the Comprehensive: Assessment of Cancer Pain. *Seminars in Oncology Nursing*. **13(1)**:16-24

Wells N. (2000). Pain intensity and Pain Interference in Hospitalizes Patients with Cancer. *Oncology Nursing Forum*. **27(6)**: 985-981

## APPENDIXES

**Borang Maklumat dan Keizinan Pesakit**

***Tajuk Kajian*** : Penaksiran Tahap Kesakitan Di Kalangan Pesakit Kanser yang mengalami metastasis di Klinik Onkologi dan Wad Onkologi Hospital Universiti Sains Malaysia (HUSM), Kelantan.

***Nama Penyelidik*** : Eleanor Usun Uben

**Pengenalan**

Anda dipelawa untuk menyertai satu kajian penyelidikan secara sukarela untuk menilaian tahap kesakitan yang dialami oleh pesakit kanser yang telah metastasis di Ward Onkologi dan Klinik Onkologi Hospital Universiti Sains Malaysia (HUSM), Kelantan. Sebelum anda bersetuju untuk menyertai kajian penyelidikan ini, adalah penting anda membaca dan memahami borang ini. Ia menghuraikan tujuan, prosedur, manfaat, risiko, ketidakselesan dan langkah berjaga-jaga kajian ini. Ia juga menghuraikan prosedur alternatif yang terdapat untuk anda dan hak anda untuk menarik diri dari kajian ini pada bila-bila masa. Sekiranya anda menyertai kajian ini, anda akan menerima satu salinan borang ini untuk disimpan sebagai rekod anda.

Penyertaan anda di dalam kajian ini dijangka mengambil masa selama 5 hingga 15 minit. Seramai 445 pesakit dijangka akan menyertai kajian ini.

**Tujuan Kajian**

Tujuan kajian ini dijalankan adalah untuk:

- 1) Mengetahui tahap keterukkan kesakitan yang dialami oleh pesakit kanser yang telah metastasis.
- 2) Mengenalpasti perkaitan antara latar belakang sosio demografi dan klinikal dengan tahap keterukkan kesakitan di kalangan pesakit kanser yang telah mengalami metastasis.

**Kelayakan Penyertaan**

Beberapa keperluan untuk menyertai kajian ini adalah:

- Anda adalah pesakit kanser tahap III dan IV yang mengalami kesakitan
- Anda boleh membaca dan menulis dalam Bahasa Malaysia
- Anda berumur 18 tahun ke atas
- Anda mengikuti kajian ini dengan sukarela

- Anda tidak mengalami sebarang kesakitan yang lain selain yang disebabkan kanser. (contohnya: Sakit dada disebabkan oleh serangan jantung)

Anda layak mengikuti kajian ini sekiranya:

- Anda berumur bawah 18 tahun
- Anda adalah penyalahguna dadah
- Anda disahkan sebagai pesakit mental
- Anda baru menjalani pembedahan

### **Prosedur-prosedur Kajian**

Anda akan diminta untuk mengisi maklumat sosiodemografi dan data klinikal, termasuk bila kanser anda disahkan, jenis dan tahap kanser, rawatan yang telah dijalankan, dan ubatan yang diberi. Soal selidik bahagian kedua adalah mengenai tahap kesakitan dan kesan kesakitan yang mempengaruhi aktiviti hidup harian berdasarkan soalan dalam soal selidik. Anda akan dibimbing oleh penyelidik sekiranya ada sebarang pertanyaan berkaitan dengan soal selidik.

### **Risiko**

Anda tidak akan mengalami sebarang risiko sekiranya mengikuti kajian ini.

### **Melaporkan Pengalaman Kesihatan**

Sekiranya anda mengalami kecederaan, efek negatif, kelesuan atau sebarang ketidakbiasaan kesihatan ketika mengikuti kajian ini, beritahu penyelidik, doktor atau jururawat secepat mungkin. Penyelidik akan memberhentikan kajian sekiranya anda berasa tidak sihat.

### **Rawatan Lain**

Anda masih boleh menjalani rawatan yang ditetapkan ketika mengikuti kajian ini.

### **Penyertaan Dalam Kajian**

Penyertaan anda dalam kajian ini adalah secara sukarela. Anda boleh menolak penyertaan dalam kajian ini atau anda boleh menamatkan penyertaan anda dalam kajian ini pada bila-bila masa, tanpa sebarang hukuman atau kehilangan sebarang manfaat yang sepatutnya diperolehi oleh anda.

### **Manfaat yang Mungkin**

Tiada hadiah atau saguhati akan diberikan, tetapi informasi yang akan diperolehi melalui penyelidikan ini akan memberi manfaat kepada pendidikan kejururawatan dan penyelidikan untuk masa depan.

## **Soalan**

Sekiranya anda mempunyai sebarang soalan mengenai kajian ini atau hak-hak anda, sila hubungi

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Tel.: 7663117 / 7663760

## **Kerahsiaan**

Maklumat perubatan anda akan dirahsiakan oleh doktor dan kakitangan kajian dan tidak akan dedahkan secara umum melainkan jika ia dikehendaki oleh undang-undang.

Data yang diperolehi dari kajian yang tidak mengenalpasti anda secara perseorangan akan diberi kepada pihak penaja dan/atau wakil-wakilnya dan mungkin akan diterbitkan untuk pendidikan kejururawatan di PPSK Kampus Kesihatan USM.

Rekod perubatan anda yang asal mungkin akan dilihat oleh pihak penaja dan/atau wakil-wakilnya, Lembaga Etika kajian ini dan pihak berkuasa regulatori untuk tujuan mengesahkan prosedur dan/atau data kajian klinikal. Maklumat perubatan anda mungkin akan disimpan dalam komputer dan diproses dengannya.

Dengan menandatangani borang persetujuan ini, anda membenarkan penelitian rekod, penyimpanan maklumat dan pemindahan data seperti yang dihuraikan diatas.

## **Tandatangan**

Untuk dimasukkan ke dalam kajian ini, anda atau wakil sah anda mesti menandatangani serta menarikhkan halaman tandatangan

**Borang Keizinan Pesakit (Halaman Tandatangan)**

---

**Tajuk Kajian :** Penaksiran Tahap Kesakitan di Kalangan Pesakit Kanser yang mengalami metastasis di Klinik Onkologi dan Wad Onkologi Hospital Universiti Sains Malaysia (HUSM), Kelantan.

**Nama Penyelidik :** Eleanor Usun Uben

Untuk menyertai kajian ini, anda atau wakil sah anda mesti menandatangani mukasurat ini.

Dengan menandatangani mukasurat ini, saya mengesahkan yang berikut:

- μ Saya telah membaca semua maklumat dalam Borang Maklumat dan Keizinan Pesakit ini **termasuk apa-apa maklumat berkaitan risiko yang ada dalam kajian** dan saya telahpun diberi masa yang mencukupi untuk mempertimbangkan maklumat tersebut.
- μ Semua soalan-soalan saya telah dijawab dengan memuaskan
- μ Saya, secara sukarela, bersetuju menyertai kajian penyelidikan ini, mematuhi segala prosedur kajian dan memberi maklumat yang diperlukan kepada doktor, para jururawat dan juga kakitangan lain yang berkaitan apabila diminta.
- μ Saya boleh menamatkan penyertaan saya dalam kajian ini pada bila-bila masa.
- μ Saya telahpun menerima satu salinan Borang Maklumat dan Keizinan Pesakit untuk simpanan peribadi saya.

---

**Nama Pesakit (Ditera atau Ditaip)**

---

**Nama Singkatan**

---

**No. Kad Pengenalan Pesakit (baru)**

---

**No. K/P (lama)**

---

**Tandatangan Pesakit atau Wakil Sah**  
(Masukkkan masa jika perlu)

---

**Tarikh (ddMMyy)**

---

**Nama & Tandatangan Individu yang Mengendalikan**  
Perbincangan Keizinan (Ditera atau Ditaip)

---

**Tarikh (ddMMyy)**

---

**Nama Saksi dan Tanda Tangan**

---

**Tarikh (ddMMyy)**

**Nota:**

Semua subjek/pesakit yang mengambil bahagian dalam kajian penyelidikan ini tidak dilindungi oleh insuran

## DATA SOSIODEMOGRAFI DAN KLINIKAL

1. Umur: \_\_\_\_\_

2. Jantina  Lelaki  
 Perempuan3. Etnik:  Melayu  Cina  
 India  Lain-lain (Nyatakan: \_\_\_\_\_)4. Status Perkahwinan:  Bujang  Duda / Balu  
 Berkahwin  Bercerai / Berpisah5. Pekerjaan:  Tidak bekerja  Pesara  
 Bekerja ( Nyatakan: \_\_\_\_\_)6. Tahap Pendidikan  Tiada Pendidikan Formal  SPM/STPM  
 UPSR/PMR  Kolej/Universiti

7. Rawatan Kanser Yang Pernah Diterima:

 Kemoterapi  Radioterapi  
 Imunoterapi  Pembedahan  
 Lain-lain (Nyatakan): \_\_\_\_\_

Jenis Kanser: \_\_\_\_\_

Tahap penyakit (contoh T N M)  T Tumor  
 N Merebak ke nodus limfa  
 M MetastasisUbatan analgesia  Ya  
 Tidak

Translated Version of Brief Pain Inventory-Short Form

INVENTORI RINGKAS KESAKITAN-FORMAT PENDEK

Tarikh: \_\_\_\_\_

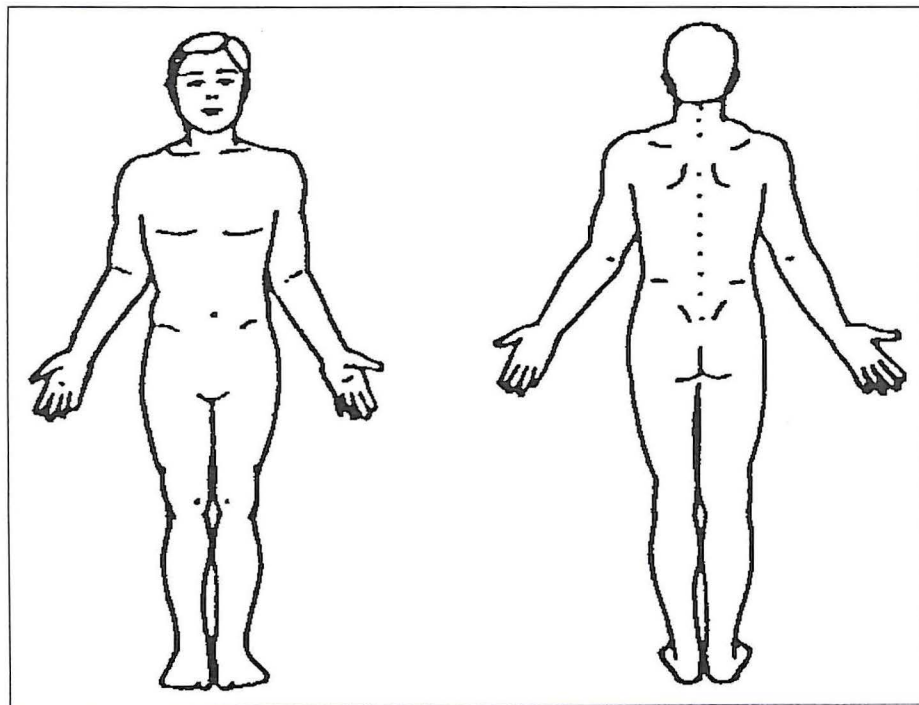
Masa: \_\_\_\_\_

1. Sepanjang hidup ini, kebanyakan kita pernah mengalami kesakitan dari semasa ke semasa (seperti sakit kepala, terseliuh/tergeliat, sakit gigi dan lain-lain). Adakah anda mengalami kesakitan selain kesakitan biasa seperti di atas pada hari ini?

1. YA

2. TIDAK

2. Pada gambarajah di bawah, hitamkan bahagian mana anda merasa sakit. Tandakan X pada bahagian yang paling sakit.



3. Sila bulatkan satu nombor yang terbaik untuk menggambarkan tahap kesakitan yang paling teruk anda alami dalam masa 24 jam terakhir ini.

0 1 2 3 4 5 6 7 8 9 10  
Tiada Amat  
sakit sakit

4. Sila bulatkan satu nombor yang terbaik untuk menggambarkan tahap kesakitan yang paling ringan anda alami dalam masa 24 jam terakhir ini.

0 1 2 3 4 5 6 7 8 9 10  
Tiada Amat  
sakit sakit

5. Sila bulatkan satu nombor yang terbaik untuk menggambarkan kesakitan anda pada tahap sederhana.

0 1 2 3 4 5 6 7 8 9 10  
Tiada Amat  
sakit sakit

6. Sila bulatkan satu nombor yang terbaik untuk menggambarkan kesakitan anda rasa sekarang.

0 1 2 3 4 5 6 7 8 9 10  
Tiada Amat  
sakit sakit

7. Apakah rawatan atau ubatan yang anda terima untuk kesakitan yang anda alami?

---

---

8. Dalam tempoh 24 jam terakhir ini, berapa banyakkah kelegaan yang anda alami setelah menerima rawatan atau ubatan? Sila bulatkan satu peratusan yang menggambarkan kelegaan tersebut.

0% 1% 2% 3% 4% 5% 6% 7% 8% 9% 10%  
Tiada Kelegaan  
kelegaan sepenuhnya

9. Sila bulatkan satu nombor yang terbaik untuk menggambarkan kesakitan dalam masa 24 jam terakhir ini mengganggu keadaan berikut:

**A. Aktiviti umum**

0 1 2 3 4 5 6 7 8 9 10  
Tiada Mengganggu  
mengganggu sepenuhnya

**B. Mood / Keadaan perasaan**

0 1 2 3 4 5 6 7 8 9 10  
Tiada Mengganggu  
Mengganggu sepenuhnya

**C. Keupayaan untuk berjalan**

0 1 2 3 4 5 6 7 8 9 10  
Tiada Mengganggu  
Mengganggu sepenuhnya

**D. Kerja biasa (termasuk di dalam dan di luar rumah)**

0 1 2 3 4 5 6 7 8 9 10  
Tiada mengganggu  
Mengganggu sepenuhnya

**E. Hubungan dengan orang lain**

0 1 2 3 4 5 6 7 8 9 10  
Tiada mengganggu  
Mengganggu sepenuhnya

**F. Tidur**

0 1 2 3 4 5 6 7 8 9 10  
Tiada mengganggu  
Mengganggu sepenuhnya

**G. Kenikmatan hidup**

0 1 2 3 4 5 6 7 8 9 10  
Tiada mengganggu  
Mengganggu sepenuhnya

Original Version of Brief Pain Inventory-Short Form

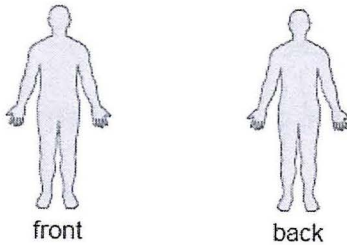
# Brief Pain Inventory

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Name: \_\_\_\_\_

- 1) Throughout our lives, most of us have had pain from time to time (such as minor headaches, sprains, and toothaches). Have you had pain other than these everyday kinds of pain today?  
 1. Yes      2. No

- 2) On the diagram, shade in the areas where you feel pain. Put an X on the area that hurts the most.



- 3) Please rate your pain by circling the one number that best describes your pain at its worst in the past 24 hours.  
 0 1 2 3 4 5 6 7 8 9 10  
 No Pain as bad as you can imagine  
 pain

- 4) Please rate your pain by circling the one number that best describes your pain at its least in the last 24 hours.  
 0 1 2 3 4 5 6 7 8 9 10  
 No Pain as bad as you can imagine  
 pain

- 5) Please rate your pain by circling the one number that best describes your pain on average.  
 0 1 2 3 4 5 6 7 8 9 10  
 No Pain as bad as you can imagine  
 pain

- 6) Please rate your pain by circling the one number that tells how much pain you have right now.  
 0 1 2 3 4 5 6 7 8 9 10  
 No Pain as bad as you can imagine  
 pain

- 7) What treatments or medications are you receiving for your pain?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

- 8) In the past 24 hours, how much relief have pain treatments or medications provided? Please circle the one percentage that most shows how much relief you have received.

0% 10 20 30 40 50 60 70 80 90 100%  
 No Complete  
 relief relief

- 9) Circle the one number that describes how, during the past 24 hours, pain has interfered with your:

A. General activity  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

B. Mood  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

C. Walking ability  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

D. Normal work (includes both work outside the home and housework)  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

E. Relations with other people  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

F. Sleep  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

G. Enjoyment of life  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

H. Ability to concentrate  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

I. Appetite  
 0 1 2 3 4 5 6 7 8 9 10  
 Does not Completely  
 interfere interferes

2.3.5	Renal Mn-SOD mRNA levels in SHR and age-matched WKY rats	73
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