



UNIVERSITI PUTRA MALAYSIA

***PREVALENCE AND PREDICTORS OF DEPRESSION AND ANXIETY
AMONG ONCOLOGY PATIENTS RECEIVING CHEMOTHERAPY IN
PUBLIC HOSPITALS IN PENINSULAR MALAYSIA***

MAMTA VESUDAVE A/P REMESH KUMAR

FPSK(M) 2018 27



**PREVALENCE AND PREDICTORS OF DEPRESSION AND ANXIETY
AMONG ONCOLOGY PATIENTS RECEIVING CHEMOTHERAPY IN
PUBLIC HOSPITALS IN PENINSULAR MALAYSIA**

By

MAMTA VESUDAVE A/P REMESH KUMAR

**Thesis Submitted to the School of Graduate Studies,
Universiti Putra Malaysia, in Fulfillment of the
Requirements for the Degree of Master of Science**

March 2018

COPYRIGHT

All material contained within the thesis, including without limitation text, logos, icons, photographs and all other artwork, is copyright material of Universiti Putra Malaysia unless otherwise stated. Use may be made of any material contained within the thesis for non-commercial purposes from the copyright holder. Commercial use of material may only be made with the express, prior, written permission of Universiti Putra Malaysia.

Copyright © Universiti Putra Malaysia



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

**PREVALENCE AND PREDICTORS OF DEPRESSION AND ANXIETY
AMONG ONCOLOGY PATIENTS RECEIVING CHEMOTHERAPY IN
PUBLIC HOSPITALS IN PENINSULAR MALAYSIA**

By

MAMTA VESUDAVE A/P REMESH KUMAR

March 2018

Chairman: Professor Sherina Mohd Sidik, PhD
Faculty: Medicine and Health Sciences

Background: The number of cancer cases in Malaysia has increased from 2008 with 32, 000 cases to 37,000 new cases in 2012. Cancer patients undergoing chemotherapy experienced high level of depression and anxiety.

Objectives: To determine the prevalence and predictors of depression and anxiety among oncology patients receiving chemotherapy in public hospitals in Peninsular Malaysia.

Methodology: A cross-sectional study was conducted in public hospitals in Peninsular Malaysia. All (N=1356) cancer patients who were Malaysian citizens undergoing chemotherapy were included in this study. The data were collected using self-administered questionnaires. Data were analysed using the Statistical Package for Social Sciences Software (version 22.0). Descriptive statistics was conducted to obtain frequency and percentage of variables. Inferential analysis was done by using chi square or Fisher's exact test to determine the association between variables at level of significance, $p < 0.05$. Simple logistic regression was used to determine the crude odd ratio and variables with p value < 0.25 were entered into the multivariate logistic regression model to determine significant predictors for depression and anxiety. The best predictor was based on adjusted odds ratio.

Results: Out of 1356 respondents, all respondents participated in this study. The prevalence of depression was 34.0%. The prevalence of anxiety was 54.8%. The best predictor for depression and anxiety were level of social support.

Conclusion: This present study's finding indicates that the cancer care services should improve in management and intervention on depression and anxiety.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**PREVALENS DAN PERAMAL KEMURUNGAN DAN KEBIMBANGAN DI
KALANGAN PESAKIT ONKOLOGI MENERIMA KEMOTERAPI DI
HOSPITAL AWAM DI SEMENANJUNG MALAYSIA**

Oleh

MAMTA VESUDAVE A/P REMESH KUMAR

Mac 2018

Pengerusi: Professor Sherina Mohd Sidik, PhD
Fakulti: Perubatan dan Sains Kesihatan

Latar Belakang: Jumlah kes kanser di Malaysia meningkat daripada tahun 2008 dengan 32,000 kes kepada 37,000 kes baru pada tahun 2012. Pesakit kanser menjalani kemoterapi mengalami tahap kemurungan dan kebimbangan yang tinggi.

Objektif: Menentukan prevalens dan peramal kemurungan dan kebimbangan di kalangan pesakit onkologi menerima kemoterapi di hospital awam di Semenanjung Malaysia.

Metodologi: Satu kajian keratan rentastelahdijalankan di hospital awam, Semenanjung Malaysia. Semua (N=1356) pesakit kanser yang merupakan warganegara Malaysia yang menjalani kemoterapi diambil untuk menyertai kajian ini. Data telah dikumpul dengan menggunakan soal selidik yang dijawab sendiri. Data telah dianalisis dengan menggunakan *Statistical Package for Social Sciences Software* (versi 22.0). Statistik deskriptif telah dijalankan untuk mendapatkan kekerapan dan peratusan pembolehubah. Analisis inferensi dilakukan dengan menggunakan khi kuasa dua atau *Fisher's exact test* untuk menentukan hubungan antara pembolehubah pada tahap signifikan, $p < 0.05$. Pembolehubah dengan *p-value* kurang daripada

0.25 telah dipilih untuk analisis regresi logistik multivariate bagi menentukan peramal kemurungan dan kebimbangan. Ramalan terbaik adalah berdasarkan nisbah odds diselaraskan.

Keputusan: Daripada 1356 responden, semua responden menyertai kajian ini. Prevalens kemurungan adalah 34.0%. Prevalens kebimbangan adalah 54.8%. Peramal yang terbaik untuk kemurungan dan kebimbangan adalah tahap sokongan sosial.

Kesimpulan: Penemuan kajian ini menunjukkan bahawa perkhidmatan penjagaan kanser perlu ditingkatkan dalam pengurusan dan intervensi pada kemurungan dan kebimbangan.



ACKNOWLEDGEMENTS

I would like to express my utmost gratitude to my supervisor, Professor Dr. Sherina Mohd Sidik for her great support, assistance, guidance and motivation throughout this study, my co-supervisors, Professor Dr. Lekhraj Rampal and Dr Siti Irma Fadhilah, for their encouragement, advice and assistance and my examiners Dr Huda binti Zainuddin, Dr Firdaus binti Mamat and Y. Bhg. Prof. Dr Khairani Omar. I would also like to specially thank Dr Ummavathy for her precious time in helping me complete my project.

I extend my sincere gratitude to all the Government Hospitals Director, Head of Pharmacy Department and Pharmacist in charge of Oncology Departments who have contributed directly or indirectly to this project. I also thank all the authors for their permission to use their questionnaires in this study and also my working colleagues (Hospital Sultanah Hajjah Kalsom) for their understanding and kindness.

A special thanks to my friend Vidhya Sivaperumal, Suhashinee, classmates and Universiti Putra Malaysia (UPM) staffs for their unlimited help and kindness.

Last but not least, I would like to thank my husband and my daughter (Thanabalan Sengoda, Isha Thanabalan), parents (Mr. Remesh Kumar and Madam Rita Kumari), my in laws (Mr Sengoda and Madam Parumai), siblings (Levenya Vasdave, Tharvik Vasdave, Haresh Vasdave) for all their moral support, motivation, patience and understanding throughout this challenging period.

I certify that a Thesis Examination Committee has met on 14 March 2018 to conduct the final examination of Mamta Vesudave a/p Remesh Kumar on her thesis entitled "Prevalence and Predictors of Depression and Anxiety among Oncology Patients Receiving Chemotherapy in Public Hospitals in Peninsular Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

Members of the Thesis Examination Committee were as follows:

Huda binti Zainuddin, PhD

Senior Lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Firdaus binti Mamat @ Mukhtar, PhD

Senior Lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Internal Examiner)

Khairani Omar, PhD

Professor
Universiti Sains Islam Malaysia
Malaysia
(External Examiner)



NOR AINI AB. SHUKOR, PhD
Professor and Deputy Dean
School of Graduate Studies
Universiti Putra Malaysia

Date: 26 April 2018

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

Sherina Mohd Sidik, MBBS, MMED (Family Medicine), PhD

Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Chairman)

Lekhraj Rampal, MBBS, MPH, DRPH, FAMM, FAMS, FPHMM

Professor
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Member)

Siti Irma Fadhillah, BSc (Psychology), MA (Clinical Psychology), PhD

Senior Lecturer
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
(Member)

ROBIAH BINTI YUNUS, PhD

Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:

Declaration by graduate student

I hereby confirm that,

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any other institutions;
- intellectual property from the thesis and copyright of thesis are fully-owned by Universiti Putra Malaysia, as according to the Universiti Putra Malaysia (Research Rules, 2012);
- written permission must be obtained from supervisor and the office of Deputy Vice-Chancellor (Research and Innovation) before thesis is published (in the form of written, printed or in electronic form) including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/ fabrication in the thesis, and scholarly integrity is upheld as according to the Universiti Putra Malaysia (Graduate Studies) Rules (Revision 2012-2013) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software.

Signature: _____

Date: _____

Name and Matric No.: Mamta Vesudave A/P Remesh Kumar, (GS 42856)

Declaration by Members of Supervisory Committee

This is to confirm that:

- the research conducted and the writing of this thesis was under our supervision;
- supervision responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) rules 2003 (Revision 2012-2013) are adhered to.

Signature: _____

Name of Chairman
of Supervisory
Committee:

Prof Dr Sherina Mohd Sidik

Signature: _____

Name of Member of
Supervisory
Committee:

Prof Datuk Dr Lekhraj Rampal

Signature: _____

Name of Member of
Supervisory
Committee:

Dr Siti Irma Fadhilah

TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xiv
LIST OF FIGURES	xvi
LIST OF ABBREVIATIONS	xvii
CHAPTER	
1 INTRODUCTION	
1.1 Background	1
1.2 Problem Statement	2
1.3 Significant of Study	4
1.4 Objectives	4
1.4.1 General Objectives	4
1.4.2 Specific Objectives	4
1.5 Research Hypotheses	5
2 LITERATURE REVIEW	
2.1 General problem of the study	6
2.2 Cancer	7
2.3 Cancer Treatment	7
2.4 Importance of counselling for oncology patients	8
2.5 Depression	8
2.6 Anxiety	10
2.7 Epidemiology of Cancer	11
2.7.1 Worldwide	11
2.7.2 Malaysia	11
2.8 Epidemiology of Depression	12
2.8.1 Worldwide	12
2.8.2 Malaysia	13
2.9 Epidemiology of Anxiety	13
2.9.1 Worldwide	13
2.9.2 Malaysia	13
2.10 Risk Factors of Depression and Anxiety among Cancer patients undergoing Chemotherapy	14
2.10.1 Socio-demographic Characteristic	14
2.10.2 Severity of cancer	16

	2.10.3	Level of Social support	18
	2.10.4	Level of Hopelessness	19
2.11		Conceptual Framework	19
3		METHODOLOGY	
	3.1	Study Location	21
	3.2	Study Design	22
	3.3	Study Duration	22
	3.4	Study Population	22
	3.5	Sampling Frame	22
	3.6	Sampling Unit	22
	3.7	Sample Size Estimation	22
	3.8	Sampling Technique	24
	3.9	Data Collection	27
	3.9.1	Study Variables	27
	3.9.2	Inclusion and Exclusion Criteria	27
	3.9.3	Instruments	28
	3.10	Quality Control-Validity and Reliability	31
	3.10.1	Validity of Questionnaire	31
		3.10.1.1 Content Validity	31
		3.10.1.2 Face Validity	31
		3.10.1.3 Pretesting	32
	3.10.2	Reliability of Questionnaire	32
		3.10.2.1 Cronbach Alpha	32
	3.11	Ethical issues and consent	32
	3.12	Data Analysis	35
4		RESULTS	
	4.1	Response rate	36
	4.2	Socio-demographic characteristics and severity of cancer of the respondent	36
	4.3	Level of Social support	39
	4.4	Level of Hopelessness	39
	4.5	Prevalence of depression among oncology patients receiving chemotherapy	39
	4.6	Prevalence of anxiety among oncology patients receiving chemotherapy	40
	4.7	Depression	41
	4.7.1	Association between Socio-demographic Characteristics and Severity of cancer with Depression among the Respondents	41
	4.7.2	Association between Level of Social Support and Depression among the Respondents	44

4.7.3	Association between Level of Hopelessness and Depression among the Respondents	44
4.8	Simple Logistic Regression analysis of Predictors of Depression	45
4.9	Multivariate Logistic Regression analysis of Predictors of Depression	47
4.10	Anxiety	51
4.10.1	Association between Socio-demographic Characteristics and Severity of cancer with anxiety among the Respondents	51
4.10.2	Association between Level of Social Support and Anxiety among the Respondents	54
4.10.3	Association between Level of Hopelessness and Anxiety among the Respondents	54
4.11	Simple Logistic Regression analysis of Predictors of Anxiety	55
4.12	Multivariate Logistic Regression analysis of Predictors of Anxiety	57
5	DISCUSSION	
5.1	Response Rate	61
5.2	Prevalence of Depression	61
5.3	Prevalence of Anxiety	61
5.4	Factors associated with depression among the respondents	62
5.4.1	Association between socio-demographic characteristics and severity of cancer with depression among the respondents	62
5.4.2	Association between level of social support and depression among the respondents	66
5.4.3	Association between level of hopelessness and depression among the respondents	67
5.5	Factors associated with anxiety among the respondents	67
5.5.1	Association between socio-demographic characteristics and severity of cancer with anxiety among the respondents	71

5.5.2	Association between level of social support and anxiety among the respondents	71
5.5.3	Association between level of hopelessness and anxiety among the respondents	72
5.6	Predictors of depression among the respondents	
5.7	Predictors of anxiety among the respondents	
6	CONCLUSION AND RECOMMENDATIONS	
6.1	Conclusion	73
6.2	Strengths of the Study	73
6.3	Limitations of the study	73
6.4	Recommendations	73
	REFERENCES	75
	APPENDICES	85
	BIODATA OF STUDENT	125
	PUBLICATION	126



LIST OF TABLES

Table	Page	
3.1	Proportionate allocation to each hospital	25
3.2	Dependent and Independent Variables	27
3.3	Questionnaires used for each specific objective	28
3.4	PHQ-9 Scores to determine depression severity	29
3.5	Multidimensional Scale of Perceived Social Support	31
3.6	Reliability test results of questionnaire items(N=80)	32
4.1a	Socio-demographic characteristics of the respondents(N=1356)	37
4.1b	Severity of cancer of the respondents(N=1356)	38
4.2	Level of social support among the respondents (N=1356)	39
4.3	Level of hopelessness among the respondents (N=1356)	39
4.4a	Association between socio-demographic characteristics and depression (N=1356)	42
4.4b	Association between severity of cancer and depression (N=1356)	43
4.5	Association between level of social support and depression (N=1356)	44
4.6	Association between level of hopelessness and depression (N=1356)	44
4.7a	Crude odds ratio by simple logistic regression depression	45
4.7b	Crude odds ratio by simple logistic regression depression	46
4.8a	Predictors of depression among the respondents	48
4.8b	Predictors of depression among the respondents	49
4.9	Model summary for depression	50
4.10	Classification table for depression	50
4.11a	Association between socio-demographic characteristics and anxiety (N=1356)	52
4.11b	Association between severity of cancer and anxiety (N=1356)	53

4.12	Association between level of social support and anxiety (N=1356)	54
4.13	Association between level of hopelessness and anxiety (N=1356)	54
4.14a	Crude odds ratio by simple logistic regression anxiety	55
4.14b	Crude odds ratio by simple logistic regression anxiety	56
4.15a	Predictors of anxiety among the respondents	58
4.15b	Predictors of anxiety among the respondents	59
4.16	Model summary for anxiety	59
4.17	Classification table for anxiety	60



© COPYRIGHT

LIST OF FIGURES

Figure		Page
2.1	Cancer according to stages	12
2.2	Conceptual Framework of depression and anxiety among oncology patients receiving chemotherapy in public hospitals in Peninsular Malaysia	20
3.1	Research methodology process flow chart	34
4.1	Depression among oncology patients receiving chemotherapy (N=1356)	40
4.2	Anxiety among oncology patients receiving chemotherapy (N=1356)	41
4.3	Assessment of model discrimination by area under the ROC Curve for depression	51
4.4	Assessment of model discrimination by area under the ROC curve for anxiety	60

LIST OF ABBREVIATIONS

AKUADS	Aga Khan University Anxiety and Depression Scale
APA	American Psychiatric Association
BDS	Beck Depression Scale
BDI-Malay	Beck Depression Inventory for Malays
BHS	Beck Hopelessness Scale
CDR	Cytotoxic Drug Reconstitution
Chemo	Chemotherapy
CI	Confidence Interval
CINV	Chemotherapy-induced nausea and vomiting
DALYs	Disability-adjusted life-years
DSM-5	Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition
FA	Family
FR	Friends
GAD 7	Generalized Anxiety Disorder - 7 Scale
GAD	Generalized Anxiety Disorder
LASUTH	Lagos State University Teaching Hospital
MDD	Major Depressive Disorder
mhGAP	Mental Health Gap Action Programme
MOH	Ministry of Health
MSPSS	Multidimensional Scale of Perceived Social Support
NCI	National Cancer Institute
NHMS IV	National Health Morbidity Survey IV

NMRR	National Medical Research Register
NORI	Nuclear Medicine, Oncology, and Radiotherapy Institute
PHQ 9	Patient Health Questionnaire 9
SO	Significant others
SPSS	Statistical Package for Social Sciences Software
WHO	World Health Organization



CHAPTER 1

INTRODUCTION

This chapter provides an overview on the background of cancer, depression and anxiety. It clearly states the significance of this study, study objectives and research hypotheses conducted among chemotherapy patients.

1.1 Background

The National Cancer Council Malaysia stated that the theme for 2016 is “We Can, I Can” which mainly focuses on taking a proactive approach in the fight against cancer (National Cancer Council Malaysia, 2016). Cancer is a global problem not specific to any country (National Cancer Council Malaysia, 2016). Cancer occurs when our cells begin to reproduce in an uncontrollable manner (World Health Organization (WHO), 2012). Once cancer has manifested, it eventually spreads to other parts of the body (WHO, 2012). The consequences of cancer is various with the most severe being death (WHO, 2012). There were 14.1 million new cases of cancer, 8.2 million cancer deaths, 32.6 million people living with cancer within five years of diagnosis (Ferlay et al., 2015). In term of burden of disease there were 14.9 million cancer cases, 8.2 million deaths, and 196.3 million disability-adjusted life-years (DALYs) (Fitzmaurice, Naghavi & Murray, 2015). Factors such as unhealthy diet and physical inactivity, contributes to increase in number of new cancer cases up to 70% in the next 20 years. Men are greatly affected by lung, prostate, colorectal, stomach and liver cancer while in women, the common cancers are breast, colorectal, lung, cervix and stomach cancer (WHO, 2012). In Malaysia, cancer has been identified as among the top five causes of death (Ministry of Health Malaysia (MOH), 2013). The number of cancer cases in Malaysia has increased from 2008 with 32, 000 cases to 37,000 new cases in 2012. In year 2014, cancer death was higher in male 11,200 death compare to female 10,300 deaths (WHO, 2014).

Cancer patients undergoing chemotherapy experienced high level of depression and anxiety (Saniah & Zainal, 2010). Cancer patients have depression and anxiety due to many reasons such as reaction to cancer diagnosis, symptoms associated with cancer and worrying about the progression of cancer. Besides that, the treatment for cancer patients such as radiotherapy and chemotherapy also contributes to anxiety and depression (Zhang, Yin, You, & Dong, 2007).

Depression is a state of mental disorder and the usual signs of depression are tiredness, loss of appetite, depressed mood and followed by sadness (WHO, 2012). Clinical depression is a serious illness as it can cause patients to feel distressed and it is harder for a patient to function as well as follow treatment plans. Individuals who suffer from depression even prior to diagnosis of cancer are more likely to have suicidal thoughts (American Cancer Society, 2015). Depression is common not only among cancer patients but also among an immediate family member of those coping with cancer (Khomechian, Alizargar, & Mazoochi, 2013).

Anxiety is defined as a feeling of nervous and worried (American Psychiatric Association (APA), 2013). In Malaysia, the prevalence of anxiety among breast cancer patient undergoing chemotherapy was 24.1% (Saniah & Zainal, 2010). Meanwhile, in China, the prevalence of anxiety in cancer patients was 32% - 40% (Li, Xu, Bao, & Tang, 2007). While in most cancer cases patients undergo high levels of anxiety and depression which may prolong for weeks or months if left untreated. Eventually leading to poor compliance to treatment; prolonged recovery time and impaired quality of life (Jadoon, Munir, Shahzad, & Choudhry, 2010).

1.2 Problem Statement

In the year 2012, cancer related deaths were reported to be 8.2 million deaths (Ferlay et al., 2015). This is alarmingly higher compared to 7.6 million deaths in the year 2008 (Ferlay et al., 2010).

Facing the diagnosis of cancer itself can be an extremely stressful and emotionally upsetting experience. Approximately 40 million adults in the United States are affected with anxiety between ages of 18 and older (Anxiety and Depression Association of America, 2017). A study was conducted among 1217 cancer patients in China to determine the level of depression and anxiety. The result showed that the prevalence of depression was 66.72% and prevalence of anxiety was 6.49% (Hong, & Tian, 2014). In another study done on prevalence and correlates of anxiety and depression among cancer patients in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia among 77 participants showed that the prevalence of depression was 58.44% and prevalence of anxiety was 51% (Berihun, Haile, Abawa, Mulatie, & Shimeka, 2017).

Cancer is also an alarming health issue in Malaysia, as it is one of the five major causes of deaths (MOH, 2013). The annual incidence of cancer is an estimated 30,000 cases, making it an important public health concern. In Peninsular Malaysia a total of 18,219 patients were diagnosed with

cancer. This comprised of 8,123 males and 10,096 females (National Cancer Registry, 2007).

The prevalence of anxiety and depression among the breast cancer patients in Malaysia were 31.7% and 22.0% respectively (Hassan et al., 2015). In a study done in Hospital Kuala Lumpur among 111 cancer patients undergoing chemotherapy showed that 24.3% had high level of depression (Yusof, Zakaria, Hashim, & Dasiman, 2016).

Cancer patients receiving chemotherapy need information about their disease and treatment. This will prevent from serious complications. In order for self management to be effective, cancer patients are required to know the side effects they are likely to experience; they also need precise instruction on how to manage it (Periasamy et al., 2017). Pharmacist play a role in increasing chemotherapy-related knowledge, improving patients' positive emotions, dealing with chemotherapy adverse reactions, and improving the quality of life of patients (Wang, Wu, & Xu, 2015). In a study done on effectiveness of counselling on depression among cancer patients admitted in Pravara Rural Hospital, Loni (Bk) showed that there was a significant reduction in level of depression after counselling therapy (Vimala, 2012). The compliance on chemotherapy also plays an important role (Ma et al., 2008). A study was done on non-compliance with adjuvant radiotherapy and chemotherapy (Ma et al., 2008). The results shows that many patients are non-compliance to chemotherapy compare to radiotherapy. Increasing of non-compliance among patients will affect the progression of the disease (Ma et al., 2008).

To our understanding there is lacking information regarding the prevalence and predictors of depression and anxiety among oncology patients undergoing chemotherapy. Several studies have been conducted on depression and anxiety among cancer patients in Malaysia focusing specifically on certain types of cancer and study locations (Hassan et al., 2015; Saniah & Zainal, 2010; Tee et al., 2013; Zainal, Hui, Hang, & Bustam, 2007).

The researcher therefore intends to investigate the prevalence and predictors of depression and anxiety among oncology patients receiving chemotherapy in public hospitals in Peninsular Malaysia.

1.3 Significance of Study

This study provides information on prevalence and predictors of depression and anxiety among chemotherapy patients in Peninsular Malaysia. Other than that, this study enhances our understanding of the relationship between chemotherapy and how it is affecting depression and anxiety. The outcome of this study benefits the pharmacists to counsel oncology patients accordingly and provide proper information regarding disease, treatment and factor associated with depression and anxiety. Researchers or staffs in clinical setting can use the outcome of this research in preparation of intervention programs for cancer patients with depression and anxiety.

1.4 Objectives

1.4.1 General Objective

To determine the prevalence and predictors of depression and anxiety among oncology patients receiving chemotherapy in public hospitals in Peninsular Malaysia.

1.4.2 Specific Objectives

- I. To determine the social-demographic characteristics (age, gender, ethnicity, religion, marital status, family member living together, education level) and severity of cancer (stage of cancer, number of chemotherapy cycle, family history of cancer, pain due to chemotherapy, depressed due to cancer, treating with any anti-depressant, worried of the adverse effect due to cancer treatment and joined cancer support society) among oncology patients receiving chemotherapy.
- II. To determine the level of social support and level of hopelessness among oncology patients receiving chemotherapy.
- III. To determine the prevalence of depression and anxiety among oncology patients receiving chemotherapy.

- IV. To determine the association between the social-demographic characteristics, severity of cancer, level of social support and level of hopelessness with depression among oncology patients receiving chemotherapy.
- V. To determine the association between the social-demographic characteristics, severity of cancer, level of social support and level of hopelessness with anxiety among oncology patients receiving chemotherapy.
- VI. To determine the predictors of depression and anxiety among oncology patients receiving chemotherapy.

1.5 Research Hypotheses

- I. The prevalence of depression and anxiety among oncology patients receiving chemotherapy is high.
- II. There is a significant association between depression and social-demographic characteristics, severity of cancer, level of social support and level of hopelessness among oncology patients receiving chemotherapy.
- III. There is a significant association between anxiety and social-demographic characteristics, severity of cancer, level of social support and level of hopelessness among oncology patients receiving chemotherapy.

REFERENCES

- Agarwal, M., Hamilton, J. B., Moore, C. E., & Crandell, J. L. (2010). Predictors of Depression Among Older African American Cancer Patients. *Cancer Nursing*, 33(2):156–163, doi:10.1097/NCC.0b013e3181bd.
- Akechi, T., Okuyama, T., Uchida, M., Nakaguchi, T., Sugano, K., Kubota, Y., Ito, Y., Kazawa, Y., & Komatsu, H. (2012). Clinical Indicators of Depression among Ambulatory Cancer Patients Undergoing Chemotherapy. *Japanese Journal of Clinical Oncology*, 42(12):1175–1180, doi:10.1093/jjco/hys162.
- Akin-Odanye, E. O., Chioma, C. A., & Abiodun, O. P. (2011). Measured effect of some socio-demographic factors on depression among breast cancer patients receiving chemotherapy in Lagos State University Teaching Hospital (LASUTH). *African Health Sciences*, 11(3):341-345.
- Algtewi, E., Owens, J., & Baker, S. R. (2017). Online support groups for head and neck cancer and health related quality of life. *Quality of Life Research*, 26: 2351–2362, doi: 10.1007/s11136-017-1575-8.
- Alhajj, A. A. A., Alkhelaif, A. A., Alharbi, A. M., Alyahya, M. Y., Aldajani, M. F., Aljamahir, A. Y., Almaraih, I. F., Almalki, M. H., Mohammed, H. A., Almalki, S. J., Adbais, A. H., Allehaidan, Y. S., Alhedaily, S. M., Alyahya, R. A., & Alkhalidi, S. S. (2014). Prevalence and Associated Factors of Anxiety Disorders among Cancer Patients Presented to King Abdulaziz University Hospital - Jeddah (2014). *International Journal of Science and Research (IJSR)*, 6(2):78-96.
- American Cancer Society, (2015). A guide to chemotherapy. Extracted from: http://jgh.ca/uploads/gynonc/chemo/guide%20to%20chemotherapy_ACS.pdf
- American Psychiatric Association (APA), (2013). Diagnostic and statistical manual of mental disorder (5th ed.). Arlington, VA: American Psychiatric Association (APA).
- Anxiety and Depression Association of America, (2017). Extracted from: <https://www.adaa.org/about-adaa/press-room/facts-statistics>
- Arslan, S., Celebioglu, A., & Tezel, A. (2009). Depression and hopelessness in Turkish patients with cancer undergoing chemotherapy. *Japan Journal of Nursing Science.*, 6(2):105-10. doi: 10.1111/j.1742-7924.2009.00127.x.
- Beck, A. T., & Steer, R. A. (1988). *Beck hopelessness scale manual* (p. 29). The Psychological Corporation, San Antonio.

- Bener, A., Alsulaiman, R., Doodson, L., & Agathangelou, T. (2017). Depression, Hopelessness and Social Support among Breast Cancer Patients: in Highly Endogamous Population. *Asian Pacific Journal of Cancer Prevention*, 18(7):1889-1896. doi:10.22034/APJCP.2017.18.7.1889.
- Berihun, F., Haile, S., Abawa, M., Mulatie, M., & Shimeka, A. (2017). Prevalence and correlates of anxiety and depression among cancer patients in the University of Gondar Comprehensive Specialized Hospital, Northwest Ethiopia, *Arch Depress Anxiety*, 3(2): 042-048. doi: 10.17352/2455-5460.000022
- Beyer, K. (2009). Depression in patients with cancer receiving adjuvant chemotherapy. Retrieved from: https://eprints.usq.edu.au/6177/2/beyer_2009_whole.pdf
- Boyes, A. W., Girgis, A., Zucca, A. C., & Lecathelinais, C. (2009). Anxiety and depression among long-term survivors of cancer in Australia: results of a population-based survey, *Medical Journal of Australia*, 190(7):S94-8.
- Brothers, B. M., & Andersen, B. L. (2009). Hopelessness as a predictor of depressive symptoms for breast cancer patients coping with recurrence. 18(3):267-75. doi: 10.1002/pon.1394.
- Bseiso, R. A., & Thabet, A. M. (2017). The Relationship between Siege Stressors, Anxiety, and Depression among patients with Cancer in Gaza Strip. *Health Science Journal*, 11(2), doi:10.21767/1791-809X.1000499.
- Chan, H. K., & Ismail, S., (2014). Side Effects of Chemotherapy among Cancer Patients in a Malaysian General Hospital: Experiences, Perceptions and Informational Needs from Clinical Pharmacist. *Asian Pacific Journal of Cancer Prevention* 2014, 15(13):5305-9.
- Chen, X., Zheng, Y., & Shu, X. O. (2009). Prevalence of depression and its related factors among Chinese women with breast cancer. *Acta Oncologica*, 48(8):1128-1136.
- Chintamani, Gogne, A., Khandelwal, R., Tandon, M., Jain, S., Kumar, Y., Narayan, N., Bamal, R., Srinivas, S., & Saxena, S. (2011). The correlation of anxiety and depression levels with response to neoadjuvant chemotherapy in patients with breast cancer. *Journal of the Royal Society of Medicine Short Reports*, 2(3):15, doi:10.1258/shorts.2010.010072.

- Chung, J., Ju, G., Yang, J., Jeong, J., Jeong, Y., Choi, M. K., Kwon, J., Lee, K. H., Kim, S. T., & Han, H. S. (2017). Prevalence of and factors associated with anxiety and depression in Korean patients with newly diagnosed advanced gastrointestinal cancer. *The Korean Journal of Internal Medicine*, <https://doi.org/10.3904/kjim.2016.108>.
- Clark, D. M., Ehlers, A., Hackmann, A., McManus, F., Fennell, M., Grey, N., Waddington, L., & Wild, J. (2006). Cognitive therapy versus exposure and applied relaxation in social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *74*:3, 568-78.
- Dawson, B., & Trapp, R. (2001). Basic and clinical biostatistics (3rd Edition ed.). United States: McGraw Hill.
- Degi, C. L. (2013). Psychosocial Aspects of Cancer in Hospitalized Adult Patients in Romania, *Social and Behavioral Sciences*, *82*:32 – 38.
- Duric, V. M., Butow, P. N., Sharpe, L., Boyle, F., Beith, J., Wilcken, N. R. C., Heritier, S., Coates, A. S., Simes, R. J., & Stockler, M. R. (2007). Psychosocial factors and patients preferences for adjuvant chemotherapy in early breast cancer. *Psycho-Oncology*, *16*:48-59.
- Evşen, N., Sevban, A., Hakan, N., Mehmet, A. N., Hatice, K., & Zeynep, K. (2012). Anxiety and Symptom Assessment in Turkish Gynecologic Cancer Patients Receiving Chemotherapy. *Asian Pacific Journal of Cancer Prevention*, *13*:3129-3133.
- Ferlay, J., Shin, H. R., Bray, F., Forman, D., Mathers, C., & Parkin, D. M. (2010). Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *International Journal of Cancer*, *127*:2893–2917.
- Ferlay, J., Soerjomataram, I., Dikshit, R., Eser, S., Mathers, C., Rebelo, M., Parkin, D. M., Forman, D., & Bray, F. (2015). Cancer incidence and mortality worldwide: sources, methods and major patterns in GLOBOCAN 2012. *136*(5):E359-86. doi: 10.1002/ijc.29210.
- Fitzmaurice, T., Naghavi, M & Murray, C. J.L (2015). The Global Burden of Cancer 2013: Global Burden of Disease Cancer Collaboration. *JAMA Oncology* 2015;1(4):505-527. doi:10.1001/jamaoncol.2015.0735.
- Harcourt, D., & Frith, H. (2008). Women's Experiences of an Altered Appearance during Chemotherapy: An Indication of Cancer Status. *Journal of Health Psychology*, *13*:597.

- Hartung, T.J., Brahler, E., Faller, H., Harter, M., Hinz, A., Johansen, C., Keller, M., Koch, U., Schulz, H., Weis, J., & Mehnert, A. (2016). The risk of being depressed is significantly higher in cancer patients than in the general population: Prevalence and severity of depressive symptoms across major cancer types. *European Journal of Cancer*, 72:46-53, doi:10.1016/j.ejca.2016.11.017.
- Hatcher, O., & Kumar, A. A. (2014). Chemotherapy and radiotherapy for colorectal cancers. *Surgery (Oxford)*, 32(4):179-184.
- Hassan, M. R., Shah, S. A., Ghazi, H. F., Mujar, N. M. M., Samsuri, M. F., & Baharom, N. (2015). Anxiety and Depression among breast cancer patients in a urban setting in Malaysia. *Asian Pacific Journal of Cancer* 2015, 16(9): 4031-5.
- Hinz, A., Mehnert, A., Kocalevent, R. D., Brahler, E., Singer, T. F. S., & Schulte, T. (2016). Assessment of depression severity with the PHQ-9 in cancer patients and in the general population. *BMC Psychiatry* (2016) 16:22 DOI 10.1186/s12888-016-0728-6.
- Hong, J. S., & Tian, J. (2014). Prevalence of anxiety and depression and their risk factors in Chinese cancer patients. *Support Care Cancer*, 22:453–459, DOI 10.1007/s00520-013-1997-y.
- Hosmer, D. W., & Lemeshow, S. (2000). *Applied logistic regression* (2nd ed.). Hoboken, NJ: Wiley.
- Jadoon, N. A., Munir, W., Shahzad, M. A., & Choudhry, Z. S. (2010). Assessment of depression and anxiety in adult cancer outpatients: a cross-sectional study. *BioMed Central* 2010, 10:1471–2407.
- Jemal, A., Siegel, R., & Ward, E. (2008). Cancer statistics. *CA Cancer Journal of Clinicians*, 58(2):71–96, DOI: 10.3322/caac.20107.
- Johns, S. A., Kroenke, K., Krebs, E. E., Theobald, D. E., Wu, J., & Tu, W. (2013). Longitudinal Comparison of Three Depression Measures in Adult Cancer Patients. *J Pain Symptom Manage*. 45(1):71–82. doi:10.1016/j.jpainsymman.2011.12.284.
- Khalil, A., Faheem, M., Fahim, A., Innocent, H., Mansoor, Z., Rizvi, S., & Farrukh, H. (2016). Prevalence of Depression and Anxiety amongst Cancer Patients in a Hospital Setting: A Cross-Sectional Study. *Psychiatry Journal* 2016:1-6.
- Khamechian, T., Alizargar, J., & Mazoochi, T. (2013). Prevalence of Depression in patients with Cancer. *Middle-East Journal of Scientific Research*, 15(9):1311-1315.

- Kroenke, K., Spitzer, R. L., & Williams, J. B. W. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9):606–613, doi:10.1046/j.1525-1497.2001.016009606.x
- Kroenke, K., & Spitzer, R. L. (2002). The PHQ-9: a new depression diagnostic and severity measure. *Psychiatric Annals*, 32:509-521.
- Lavdaniti, M., Barbas, G., Fratzana, A., & Zyga, S. (2012). Evaluation of depression in colon cancer patients. *Health Science Journal*, 6(4).
- Lemeshow, S., Hosmer, D. W., Klar, J., & Lwanga, S. K. (1990). Adequacy of sample size in health studies. Hoboken, NJ, Wiley.
- Li, M., & Wang, L. (2016). The Associations of Psychological Stress with Depressive and Anxiety Symptoms among Chinese Bladder and Renal Cancer Patients: The Mediating Role of Resilience. *Public Library of Science*, doi:10.1371/journal.pone.0154729.
- Li, X. J., Dai, Z. Y., Zhu, B. Y., Zhen, J. P., Yang, W. F., & Li, D. Q. (2014). Effects of Sertraline on Executive Function and Quality of Life in Patients with Advanced Cancer. *International Scientific Literature, Inc.*, 20:1267-1273.
- Li, Z., Xu, H. Y., Bao, J. J., & Tang, Y. Y. (2007). An investigation of emotional disorder in cancer inpatients. *Journal of Clinical Psychosomatic Diseases*, 13:250–251.
- Lim, C., Devi, M., & Ang, E. (2011). Anxiety in women with breast cancer undergoing treatment: a systematic review. *International Journal of Evidence Based Healthcare*, 9(3):215-35, DOI: 10.1111/j.1744-1609.2011.00221.x.
- Linden, W., Vodermaier, A., MacKenzie, R., & Greig, D. (2012). Anxiety and depression after cancer diagnosis: Prevalence rates by cancer type, gender, and age. *Journal of Affective Disorders*, 141:343–351.
- Liu, C. L., Liu, L., Zhang, Y., Dai, X. Z., & Wu, H. (2017). Prevalence and its associated psychological variables of symptoms of depression and anxiety among ovarian cancer patients in China: a cross-sectional study. *Health and Quality of Life Outcomes*, 15(161):1-11, doi:10.1186/s12955-017-0738-1.
- Liu, Y., & Cao, C. (2014). The relationship between family history of cancer, coping style and psychological distress. *Pakistan Journal of Medical Sciences*, 30(3), 507–510. <http://doi.org/10.12669/pjms.303.4634>

- Ma, A. M. T., Barone, J., Eallis, A. E., Wu, N. J., Garcia, L. B., Estabrook, A., Rosenbaum-smith, S. M., & Tarter, P. L. (2008). Noncompliance with adjuvant radiation, chemotherapy, or hormonal therapy in breast cancer patients. *The American journal of surgery*, 196:4,500–504.
- Maneeton, B., Maneeton, N., & Mahathep, P. (2012). Prevalence of Depression and its Correlations: a Cross-sectional Study in Thai Cancer Patients. *Asian Pacific Journal of Cancer Prevention*, 13(5):2039-43, DOI:<http://dx.doi.org/10.7314/APJCP.2012.13.5.2039>.
- Ministry of health,(2013).Retrieved from :http://www.moh.gov.my/images/gallery/publications/md/ar/2011_en.pdf
- MOH(2017). *Drug Counselling Book Cancer 2016*.
- Moscow, J., & Cowan, K. (2007). *Biology of cancer. Cecil Medicine*. (23rdedition). (Goldman,L. &Ausiello, D. Eds.) Philadelphia: Saunders Elsevier.
- Mystakidou, K., Tsilika, E., Parpa, E., Athanasouli, P., Galanos, A., Anna, P., & Vlahos, L. (2009). Illness-Related Hopelessness in Advanced Cancer: Influence of Anxiety, Depression, and Preparatory Grief. *Archives of Psychiatric Nursing*, 23(2):138-147.
- National Cancer Council Malaysia,(2016). National Strategic Plan for Cancer Control Programme 2016-2020, National Cancer Society, Malaysia.
- National Cancer Institute (NCI), (2009a). Common Terminology Criteria for Adverse Events. Version 4.0 (2009). Retrieved from http://evs.nci.nih.gov/ftp1/CTCAE/CTCAE_4.02_2009-09_15_QuickReference_8.5x11.pdf
- National Cancer Institute (NCI), (2009b).Cancer: Questions and Answers. Retrieved from www.cancer.gov/cancertopics/factsheet/Sites-Types/general.
- National Cancer Registry Report, (2007). National Cancer Registry Report, Malaysia Cancer Statistics-Data and Figure-2007.Extracted from: <http://ghdx.healthdata.org/record/malaysia-national-cancer-registry-report-malaysia-cancer-statistics-data-and-figure-2007>
- Nikbakhsh, N., Moudi, S., Abbasian, S., &Khafri,S. (2014). Prevalence of depression and anxiety among cancer patients.*Caspian Journal of Internal Medicine*, 5(3):167-170.

- Ng, C. G., Mohamed, S., See, M. H., Harun, F., Dahlui, M., Sulaiman, A. H., Zainal, N. Z., & Taib, N. A. (2015). Anxiety, depression, perceived social support and quality of life in Malaysian breast cancer patients: a 1-year prospective study. *Health and Quality of Life Outcomes*, 13:205, doi:10.1186/s12955-015-0401-7.
- Ng, C. G., Siddiq, A. N. A., Aida, S. A., Zainal, N. Z., & Koh, O. H. (2010). Validation of the Malay version of the Multidimensional Scale of Perceived Social Support (MSPSS-M) among a group of medical students in Faculty of Medicine, University Malaya. *Asian Journal of Psychiatry*, 3:3–6.
- Öztunç, G., Yeşil, P., Paydaş, S., & Erdoğan, S. (2013). Social Support and Hopelessness in Patients with Breast Cancer. *Asian Pacific Journal of Cancer Prevention*, 14(1):571-8.
- Periasamy, U., Sidik, S. M., Rampal, L., Fadhilah, S. I., Akhtari-Zavare, M., & Mahmud, R. (2017). Effect of chemotherapy counselling by pharmacists on quality of life and psychological outcomes of oncology patients in Malaysia: a randomized control trial. *Health and Quality of Life Outcomes*, 15:104, doi: 10.1186/s12955-017-0680-2.
- Pinar, G., Okdem, S., Buyukgonenc, L., & Ayhan, A. (2012). The relationship between social support and the level of anxiety, depression, and quality of life of Turkish women with gynecologic cancer. *Cancer Nursing*, 35(3):229-35. doi:10.1097/NCC.0b013e31822c47bd.
- Polikandrioti, M., Evaggelou, E., Zerva, S., Zerdila, M., Koukoularis, D., & Kyritsi, E. (2008). Evaluation of depression in patients undergoing chemotherapy. *Health Science Journal*, 2(3).
- Popoola, A.O., Igwilo, A. I., & Sowunmi, A. (2013). Influence of Educational Status on the Knowledge & Practice of Breast Cancer Screening. *Journal of Science and Technology*, 3(5).
- Priscilla, D., Hamidin, A., Azhar, M. Z., Noorjan, K. O. N., Salmiah, M. S., & Bahariah, K. (2011). Depression and Quality of Life among Patients with Hematological Cancer in a Malaysian Hospital. *Malaysian journal of medicine and health sciences*, 7(1): 65-74.
- Randall, J. M., Voth, R., Burnett, E., Bazhenova, L., & Bardwell, W. A. (2013). Clinic-based depression screening in lung cancer patients using the PHQ-2 and PHQ-9 depression questionnaires: a pilot study. *Support Care Cancer*. 21:5,1503-7, doi: 10.1007/s00520-012-1712-4.

- Rizalar, S., Ozbas, A., Akyolcu, N., &Gungor, B. (2014). Effect of perceived social support on psychosocial adjustment of Turkish patients with breast cancer. *Asian Pacific Journal Cancer Prevention*, 15(8):3429-34.
- Sahin, Z. A., Tan, M., & Polat, H. (2013). Hopelessness, Depression and Social Support with End of Life Turkish Cancer Patients. *Asian Pacific Journal of Cancer Prevention*, 14(5):2823-8.
- Saniah, A. R., & Zainal, N. Z. (2010). Anxiety, Depression and Coping Strategies in Breast Cancer Patients on Chemotherapy. *Malaysian Journal of Psychiatry*, 19(2).
- Santre, M., Rathod, J., & Maidapwa, S. (2014). Prevalence of Emotional Distress in Cancer Patients . *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 13(6):09-14, www.iosrjournals.org.
- Sengul, M. C. B., Kaya, V., Sen, C. A., & Kaya, K. (2014). Association between suicidal ideation and behavior, and depression, anxiety, and perceived social support in cancer patients. *Medical Science Monitor*, 20:329-336, doi:10.12659/MSM.889989.
- Sherina, M. S., Arroll, B., & Smith, F. G. (2012a). Criterion Validity of the PHQ-9 (Malay Version) in a Primary Care Clinic in Malaysia. *Medical Journal of Malaysia*, 67(3)309–315.
- Sherina, M. S., Arroll, B., & Smith, F. G. (2012b). Validation of the GAD-7 (Malay version) among women attending a primary care clinic in Malaysia. *Journal of Primary Health Care*, 4(1), 5-12.
- Singh, R. P. B., Singh, H., Singh, C. J., & Kaur, K. T. (2015). Screening of Psychological Distress in Cancer Patients During Chemotherapy: A Cross-sectional Study. *Indian Journal of Palliative Care*, 21(3).
- So, K. W., Marsh, G., Ling, W. M., Leung, F. Y., Lo, J. C. K., Yeung, M., & Li, G. K. H. (2010). Anxiety, depression and quality of life among Chinese breast cancer patients during adjuvant therapy. *European Journal of Oncology Nursing*, 14(1):17-22. doi: 10.1016/j.ejon.2009.07.005.
- Spitzer, R. L., Kroenke, K., Williams, J. B. W., & Lowe, B. (2006). A Brief Measure for Assessing Generalized Anxiety Disorder. *Archives of Internal Medicine*, 166(10):1092-7.
- Srivastava, V., Ansari, M. A., Kumar, A., Shah, A. G., Meena, R. K., Sevach, P., & Singh, O. P. (2016). Study of Anxiety and Depression among Breast Cancer Patients from North India, *Clinical Psychiatry*, 2(1), doi: 10.21767/2471-9854.100017.

- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education.
- Tachi, T., Teramachi, H., Tanaka, K., Asano, S., Osawa, T., Kawashima, A., Yasuda, M., Mizui, M., Nakada, T., Noguchi, Y., Tsuchiya, T., & Goto, C. (2015). The Impact of Outpatient Chemotherapy-Related Adverse Events on the Quality of Life of Breast Cancer Patients. *PLOS ONE*, 10(4), doi:10.1371/journal.pone.0124169.
- Takahashi, T., Hondo, M., Nishimura, K., Kitani, A., Yamano, T., Yanagita, H., Osada, H., Shinbo, M., & Honda, N. (2008). Evaluation of quality of life and psychological response in cancer patients treated with radiotherapy. *Radiation Medicine*, 26(7):396-401, doi:10.1007/s11604-008-0248-5.
- Tavoli, A., Montazeri, M., Roshan, R., Tavoli, Z., & Melyani, M. (2008). Depression and quality of life in cancer patients with and without pain: the role of pain beliefs. *BMC Cancer*, 8:177, doi:10.1186/1471-2407-8-177.
- Tee, B. C., Phang, C. K., Rasidi, A., Rushdan, M., Aliyasand, I., & Hatta, S. (2013). The Prevalence and Risk Factors of Major Depressive Disorders in Gynaecological Cancer Patients. *Malaysian Journal of Medicine and Health Sciences*, 9(2):53-61.
- Tel, H., Sari, A., & Aydin, H. T. (2013). Social Support and Depression among the Cancer Patients. *Global Journal of Medical research Interdisciplinary*, Global Journals Inc. (USA). 13:3, Online ISSN: 2249-4618 & Print ISSN: 0975-5888.
- Torre, L. A., Bray, F., Siegel, R. L., Ferlay, J., Tieuvent, J. L., & Jemal, A. (2012). Global Cancer Statistics. *Ca Cancer Journal for Clinicians*, 65:87-108.
- Trill, M. D. (2012). Psychological aspects of depression in cancer patients: an update. *Annals of Oncology*, 23(10):x302-x305, doi:10.1093/annonc/mds350.
- Vimala G. (2012). Effectiveness of Counseling on Depression among Cancer Patients Admitted in Pravara Rural Hospital, Loni (Bk). *Journal of Krishna Institute of Medical Sciences University (JKIMSU)*, 1:2.
- Vogelaar, I. P., Van Der Post, R. S., Bisseling, T. M., van Krieken, J. H., Ligtenberg, M. J., & Hoogerbrugge, N. (2012). Familial gastric cancer: detection of a hereditary cause helps to understand its etiology. *Hereditary Cancer in Clinical Practice*, 10:18, doi:10.1186/1897-4287-10-18.

- Wang, Y., Wu, H., & Xu, F. (2015). Impact of Clinical Pharmacy Services on KAP and QOL in Cancer Patients: A Single-Center Experience. Hindawi Publishing Corporation. *BioMed Research International*, 1-8, <http://dx.doi.org/10.1155/2015/502431>.
- World Health Organization (WHO). (2008). The Global Burden of Disease 2004 update. Retrieved from: http://www.who.int/healthinfo/global_burden_disease/GBD_report_2004update_full.pdf Accessed 16.6.2012
- World Health Organization (WHO), (2010). mhGAP intervention guide for mental, neurological and substance use disorders in non-specialized health settings 2010. Retrieved from: http://whqlibdoc.who.int/publications/2010/9789241548069_eng.pdf
- World Health Organization (WHO). (2012). World suicide prevention day 2012. Retrieved from: http://www.who.int/mediacentre/events/annual/world_suicide_prevention_day/en/
- World Health Organization (WHO). (2014). Retrieved from: http://apps.who.int/iris/bitstream/10665/112738/1/9789240692671_eng.pdf
- Yang, Y. L., Liu, L., Wang, X. X., Wang, Y., & Wang, L. (2014). Prevalence and Associated Positive Psychological Variables of Depression and Anxiety among Chinese Cervical Cancer Patients: A Cross-Sectional Study. *Public Library Of Science*, 9(4):e94804.
- Yusof, S., Zakaria, F. N., Hashim, N. K., & Dasiman, R. (2016). Depressive Symptoms among Cancer Patients Undergoing Chemotherapy. *Social and Behavioral Science*, 234 : 185 – 192.
- Zainal, N., Hui, K., Hang, T., & Bustam, A. (2007). Prevalence of distress in cancer patients undergoing chemotherapy. *Asia-Pacific Journal of Clinical Oncology*, 3:219-223.
- Zhang, G. Z., Yin, Z. Q., You, X. H., & Dong, Y. J. (2007). A study on anxiety and depression of cancer patients undergoing radiotherapy and chemotherapy in the initial stage and their coping state. *Chinese Nursing Research*, 21:2852–2584.
- Zimet, G.D., Powll, S.S., Farley, G. K., Werkman, S., & Berkoff, K.A. (1990). Psychometric characteristics of the Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment*, 55:610-17.