



UNIVERSITI PUTRA MALAYSIA

***PREVALENCE AND FACTORS ASSOCIATED WITH ERECTILE
DYSFUNCTION AMONG MALES WITH HUMAN IMMUNODEFICIENCY
VIRUS IN A TERTIARY TEACHING HOSPITAL IN MALAYSIA***

AGHAHOWA ENOMA

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DYSFUNCTION AMONG MALES WITH HUMAN IMMUNODEFICIENCY
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By

AGHAHOWA ENOMA

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

December 2016

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DEDICATION

This work is dedicated to all HIV male patients in University Malaya Medical Centre.



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 FACTORS ASSOCIATED WITH ERECTILE DYSFUNCTION AMONG MALES WITH HUMAN IMMUNODEFICIENCY VIRUS IN A TERTIARY TEACHING HOSPITAL IN MALAYSIA

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December 2016

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Erectile dysfunction (ED) has been associated with the treatment of human immunodeficiency virus (HIV) and some other chronic diseases. Study on ED is still scanty in Malaysia, particularly among male HIV patients and, ED appears to be under-reported. The aim of this study is to determine the prevalence and factors associated with ED among male HIV patients in University Malaya Medical Centre.

A cross sectional study was conducted among male HIV patient on highly active anti-retroviral therapy (HAART) attending the outpatient clinic of a teaching hospital in West Malaysia. A systematic random sampling method was employed for the selection of respondents, participants were interviewed using a structured questionnaire to obtain socio-demographic data, medical history and sexual functioning.

Sexual function was measure and determine using Malay version of international index of erectile function (MVIIEF) while the ED domain of questionnaire was used to determine the presence and severity of ED. ED was defined based on validated MVIIEF, which states that participant is considered to have ED if ED domain of the MVIIEF score is <25. A total of 220 male participated in the study with a mean age of 37.87 ± 9.85 years. The prevalence of erectile dysfunction among HIV patients was 82.3%. The severity of erectile dysfunction was further categorized into severe (24.1%), moderate (19.1%), mild to moderate (20.9%) and mild (18.3%). In multivariate logistic regression analysis, patients with lower educational background were more likely to be associated with erectile dysfunction (adjusted odds ratio [OR] =2.62, 95% confidence interval [CI] 1.02-6.72). This study reports that erectile dysfunction was prevalent among men on highly HAART. Among adult male HIV patients on HAART regimen, those come from lower education background are associated with higher odds of developing erectile dysfunction. Hence, in managing patients with HIV, physicians should be more alert, and to identify patients with

lower education background as such patients are more likely to develop erectile dysfunction.



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

**PREVALENS DAN FAKTOR –FAKTOR BERKAITAN GANGGUAN
FUNGSI EREKTIL DALAM KALANGAN PESAKIT LELAKI HIV DI
SEBUAH HOSPITAL PENGAJARAN TINGGI DI MALAYSIA**

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Disfungsi erektile (DE) mempunyai kaitan dengan rawatan human immunodeficiency virus (HIV) dan penyakit kronik yang lain. Kajian mengenai DE di Malaysia amat terhad, terutamanya bagi pesakit HIV lelaki dan DE muncul sebagai kajian yang tidak banyak dilaporkan. Tujuan kajian ini adalah untuk menentukan prevalens dan faktor yang berkait dengan DE antara pesakit HIV lelaki di Pusat Perubatan Universiti Malaya. Satu kajian irisan lintang telah dijalankan di kalangan pesakit HIV lelaki yang sedang mengambil terapi “highly active anti-retroviral therapy (HAART)” dan menghadiri klinik pesakit luar daripada hospital pengajaran di Malaysia Barat.

Kaedah persampelan rawak bersistematik digunakan bagi memilih responden, peserta untuk di temubual menggunakan boring social-selidik berstruktur untuk mendapatkan data sosio-demografi, sejarah perubatan dan fungsi seksual. Tinjauan fungsi seksual duaka dan dilakukan menggunakan versi melayu jengan *international index of erectile function* (MVIIEF) sementara soalan domain DE telah digunakan untuk menentukan kewujudan dan tahap DE. DE berdasarkan MVIIEF yang disahkan, menyatakan bahawa peserta yang mempunyai ED jika mempunyai markah MVIIEF daripada domain DE ialah <25. Sejumlah dari 220 peserta lelaki mengertai kajian ini dengan purata umur adalah 37.87 ± 9.85 . Prevalens disfungsi erectile dikalangan pesakit HIV adalah 82.3%. Keterukah ringan ke sederhana telah dikategorikan lagi kepada parah (24.1%), sederhana (19.1%), sederhana ke ringan (20.9%) dan ringan (18.3%). Setelah analisis multivariat, tahap pendidikan yang lebih rendah (92.1%) adalah berkaitan dengan disfungsi erektile (AOR=2.62, 95% CL= 1.02-6.72), ia telah menunjukkan bahawa tahap pendidikan yang lebih rendah merupakan faktor risiko disfungsi erektile. Kajian ini melaporkan bahawa disfungsi erektile dalam kalangan pesakit lelaki HIV yang menggunakan HAART mempunyai kelaziman yang tinggi. Ia menunjuk secara statistik bahawa tahap pendidikan yang lebih rendah semasa yang rendah merupakan faktor risiko disfungsi erektile. Oleh itu, dalam menguruskan pesakit dengan HIV, pakar-pakar perubatan perlu lebih berjaga-

jaga, dan untuk mengenal pasti pesakit dengan latar belakang pendidikan rendah sebagai pesakit yang lebih cenderung untuk mendapat disfungsi erektile.



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

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LIST OF ABBREVIATIONS

ED	Erectile dysfunction
SD	Sexual Dysfunction
OR	Odds ratio
CI	Confidence interval
HIV	Human Immunodeficiency Virus
WHO	World Health Organization
HAART	Highly Active Antiretroviral Therapy
RNA	Ribonucleic acid
AIDS	Acquired Immunodeficiency Syndrome
IIEF	International Index of Erectile Function
PHQ-2	Patient Health Questionnaires - 2
EF	Erectile function
OF	Orgasmic function
SD	Sexual desire
IS	Intercourse satisfaction
OS	Overall satisfaction

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

World Health Organization (WHO) reported that the number of people living with Human immunodeficiency virus (HIV) or Acquired Immune Deficiency Syndrome (AIDS) has been steadily increasing and reached 38.8 million in 2015 with 95% uncertainty interval [UI] 1.7–1.9 million (Wang, et al., 2016).

Wang et al (2015) also reported that in 2015, 1.8 million new HIV infections, 75.4% of new cases, were in sub-Saharan Africa, with large proportions in western, southern, and eastern sub-Saharan Africa. Outside sub-Saharan Africa, south Asia accounted for 206, 830 (8.5%) of new infections per year. Southeast Asia accounted for 4.7% of global infections in 2015, and East Asia accounted for 2.3% (UNAIDS, 2016).

World Health Organization had reported a prevalence rate of 0.3% in South-East Asia Regions (SEAR), which makes the fourth highest prevalence of HIV infection among all 6 regions that were under WHO regions (WHO, 2012). Studies had shown that Malaysia is one of the fast growing HIV Epidemic countries in East Asia and Pacific Region with a prevalence of 0.45% (Choy, 2014).

According to Malaysia AID Council, up to 91,362 cases of people were infected with HIV until 2010, out of these, four-fifth were male (81.1%) and one-fifth were female (18.9%) and the prevalence rate was high between the age of 20 to 39 years (HIV statistics, 2011).

Those HIV patients were vulnerable to get complications from the disease in long term (Chu & Selwyn, 2011; Gandhi, Sax, & Grinspoon, 2012). Although highly active anti-retroviral therapy (HAART) had been proved to be effective in reducing AIDS-related mortality, complications had been arisen partly from the HAART therapy its self (Hima Bindu & Naga Anusha , 2011). Among all the side effects of HAART, erectile dysfunction (ED) is the most reported one in various studies (Adebimpe, Omobuwa, & Adeoye, 2015; Romero-Velez et al., 2014).

Male sexual dysfunctions can be classified into three categories which are erectile dysfunction, ejaculatory disturbances, and low sexual desire (Hatzimouratidis, Moysidis, Bekos, Tsimtsiou, Ioannidis, 2006). Study reported that indinavir has been found to be associated with highest rates of developing male sexual dysfunction (Hofbauer & Heufelder, 1996).

According to the Diagnostic and Statistical Manual of Mental Disorders (fifth edition), ED is characterized by a recurrent inability to achieve or maintain an adequate erection during partnered sexual activities (DSM L-5 2013). There are five domains in the IIEF which are erectile function, orgasmic function, sexual desire, intercourse satisfaction, Overall satisfaction. The severity of ED is categorized into no dysfunction, mild, moderate, mild to moderate and severe. Previous studies shown that the prevalence of ED in HIV patients ranges from 21.0% to 65.1% (Asboe et al., 2007; Romero-Velez et al., 2014; Trotta et al., 2008).

Epidemiological studies of risk factors have been seen as useful by adding to knowledge about what is psychogenic and organic ED. Some factors may increase the risk of ED, others may be protective. As a result of tremendous research that has been done, numerous factors have been proposed to contribute to the ED where it is multi-factorial and are caused by an interaction of HIV itself and HAART among patients with HIV.

Erectile dysfunctions can have a profound impact on an individual's quality of sexual life which can pose to negative attitudes which in turn affect patient adherence to antiretroviral (ARV) regimens as well as to safer sex strategies (Amini Lari, Faramarzi, Mesbah, Maryam, Hasan et al., 2013). Furthermore, the stigmatization or embarrassment of having ED symptoms in the society may lead to underreported or underdiagnosed of ED among adult male HIV patients (Koole, Noestlinger, & Colebunders, 2007).

Up to date, there is little study in this field of male sexual dysfunction in Malaysia, an Islamic country where sex-related issues are quite sensitive which creates a barrier among the HIV patient to get more sexual health information and support. This study was conducted to determine the prevalence and its associated factor of ED in men with HIV in a teaching hospital. Besides that, we also looked for clinical variables and demographic factors that could be associated with ED in this population.

1.2 Problem Statement

Sexuality is a fundamental aspect of every individual's life especially male encounters. A study done in Malaysia reported that 97.6% of 91,362 HIV patients in Malaysia were 20 years old and above and in reproductive age (Choy, 2014), they are most likely to have problem in sexual dysfunction not because of the side effect of the HAART (Collazos, Martínez, Mayo, & Ibarra, 2002; Schrooten et al., 2001), but along with familial and societal discrimination, medical disclosure of HIV-positive status may causes depression which may have impact on their sexual performance as well. With an increase in the number of HIV patients, their perceived quality of life and psychosocial well-being will be badly affected (Amini Lari et al., 2013; Surkan, et al., 2010), as they are at risk of having underlying depression on top of having sexual dysfunction. Thus there is a need to conduct study in this field.

However, most studies on ED among HIV male patients were carried out overseas and not in Asia as topic related to sex has always been a taboo subject due to culture and beliefs in Asian society (Ho, Singam, Hong, & Zainuddin, 2011). So far, there is only one local studies had been conducted on ED among general population in primary care setting (Ab Rahman, Al-Sadat & Yun low. 2011). Furthermore, several barriers like awareness in knowledge and the widely availability of traditional and complementary medicine make Asian males rarely to review their sexual related problems to the physicians (Ho et al., 2011). Thus, little is known about its prevalence and factor associated with sexual problems among the HIV patient in Asia country like Malaysia.

To the best of our knowledge, there are lack of studies that have been published with regard to the determinants of ED among male HIV patients on HAART in Malaysia. This leaves gap to health care professionals about what HIV patient want and need to satisfy their sexual interests.

This study will help in the treatment and management of ED among HIV patients on HAART in Malaysia. This study is designed to determine the predictor of ED in HIV positive adult male patients on HAART by using a validated questionnaires in order to find out the percentage of them having the disorder.

Despite the previous studies done on ED in Malaysia, it involves only general population and was not done in primary care setting. There is still a gap in the prevalence and determinants of ED among patient with HIV in this country. Therefore, this study is designed to determine the prevalence and determinants of ED among the patients with HIV. It is crucial particularly to know that data in the field of erectile dysfunction is still scanty in Malaysia, particularly issues related to ED among male HIV patients still remain taboo in Malaysia.

It is crucial for this study to recognize key elements that lead to ED and to increase the understanding of the connection between socio-demographic characteristic, clinical and psychosocial factors with ED in Malaysia. To our best knowledge, this is the first study in our country to look at socio-demographic characteristics, clinical risk factor and psychosocial factor simultaneously in HIV patients with and without ED. The present study is exclusive in Malaysia, in that no well-known research has examined these areas simultaneously.

1.3 Justification of Study

It is hoped that through this study, the factors associated with erectile dysfunction among HIV male patients can be recognized. Hence it can raise the awareness among the clinicians who treated this group of patients. It is important to detect those with a higher risk of getting ED among patients on HAART for early intervention. It is likewise significant to break the current stigma lurking within the society forced upon HIV patients to reduce the discrimination long perceived by them, in this

context, the sexuality needs. Perhaps, one of the ways is to incorporate sexual education into the medical curriculum to prepare a medical graduate to recognize and discuss readily sexual difficulties with the patients during their medical practice.

1.4 Research Questions

Given the general paucity of knowledge on identified factors for male erectile dysfunction in this country, the research questions are formulated as follow:

- i) What is the prevalence of ED among male HIV patients on HAART in University Malaya Medical Center?
- ii) Is there any association between the socio-demographic factor, HIV profiles, psychosocial factors and erectile dysfunction?

1.5 Study Objectives

1.5.1 General objective

The aim of this study is to determine the prevalence and factors associated with erectile dysfunction among male HIV patients in University Malaya Medical Centre.

1.5.2 Specific Objectives.

The specific objectives of the study are as follow:

- i) To describe the distribution of male HIV patients on HAART by socio-demographic characteristic, HIV profile and psychosocial factors.
- ii) To determine the prevalence of erectile dysfunction among male HIV patients on HAART.
- iii) To determine the association between socio-demographic characteristics, HIV profile, psychosocial factors and erectile dysfunction among male HIV patients on HAART.
- iv) To determine the factors associated with of erectile dysfunction among male HIV patients on HAART.

1.6 Research Hypothesis

The research hypothesis are:

- H₁***: There is a significant association between the social-demographic factor and ED among male HIV patients on HAART treatment.
- H₂***: There is a significant association between clinical risk factors and ED among male HIV patients on HAART treatment.
- H₃***: There is a significant association between psychosocial factors and ED among male HIV patients on HAART treatment.

1.7 Conceptual Framework

Conceptual framework shows the visual representative of how the independent variables will be associate with the dependent variable.

1. Dependent Variable is consist of erectile dysfunction among male HIV patients on HAART.
2. Independent Variables are divided into three categories which are:
 - a) HIV profiles (mode of transmission, co-morbidities, CD4 count, viral loads and duration of treatment).
 - b) Socio-demographic factors (age, ethnicity, educational level, occupation, house household income, smoking Status, alcohol intake, marital status.
 - c) Psychosocial factor (depression).

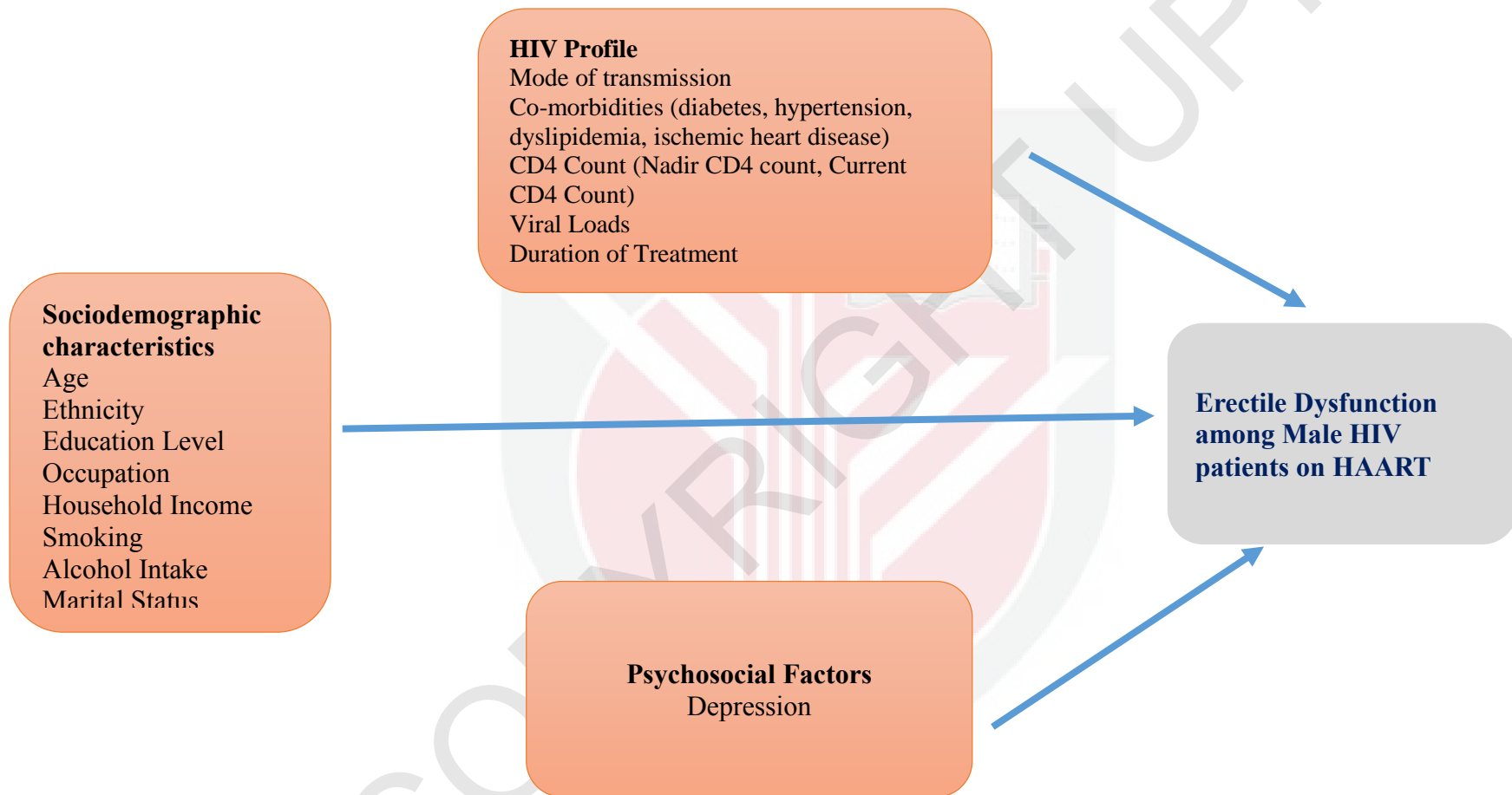


Figure 1.1: Conceptual Framework of Erectile Dysfunction among Male HIV Patient on HAART

1.8 Conceptual and Operational Definition

1.8.1 Erectile Dysfunction

I. Conceptual definition

Erectile dysfunction is defined as the persistent inability to attain and maintain an erection sufficient to permit satisfactory sexual performance (NIH Consensus Conference, 1993; Araujo, Johannes, Feldman, Derby, & McKinlay, 2000; Crum, Furtek, Olson, Amling, & Wallace, 2005).

II. Operational definition

The operational definition of ED is based on validated Malay version of International index of erectile function questionnaire (MVIIEF) (Rosen et al, 1997). The participant is considered to have ED if ED domain of the MVIIEF score is <25.

1.8.2 Ethnicity

I. Conceptual definition

Ethnicity is a multi-faceted quality that refers to the group to which people belong, and/or are perceived to belong, as a result of certain shared characteristics, including geographical and ancestral origins, but particularly cultural traditions and languages (Bhopal, 2004).

II. Operational definition

The ethnicity was classified into four groups which were Malay, Chinese, Indian and other.

1.8.3 Educational Level

I. Conceptual definition

According to the Canadian classification of institutional unit and sectors (CCIOUS), 2012 Educational attainment or level refers to the highest level of schooling that a person has reached. At the primary and secondary school level, educational attainment refers to the number of grades completed. At the postsecondary level, it refers to institutions attended and certificates, degrees or diplomas obtained.

II. Operational definition

It was classified into four classes which were no formal education, primary education, secondary education or tertiary education. Primary education was up to Standard 5 or Standard 6. Secondary education were up to “*Sijil Rendah Penilaian*” (Form 3) or “*Penilaian Menengah Rendah*” (Form 3) or “*Sijil Pelajaran Malaysia*” (Form 5). Tertiary education includes “*Sijil Tinggi Pelajaran Malaysia*” (Form 6, A level), Diploma, Degree, Master, or Philosophy Doctor (PhD).

1.8.4 Occupation

I. Conceptual definition

Occupation is defined as the active or "doing" process of a person engaged in goal-directed, intrinsically gratifying, and culturally appropriate activity (Evans, 1987).

II. Operational definition

The occupation is classified into two group which are employed and unemployed.

1.8.5 CD4 Cell Count

I. Conceptual definition

The CD4 T-cell count (CD4 count) serves as the major laboratory indicator of immune function in patients who have HIV infection. It is one of the key factors in determining both the urgency of antiretroviral therapy (ART) initiation and the need for prophylaxis for opportunistic infections (Michael Carter, 2016).

II. Operational definition

Current CD4 Count is the latest CD4 result which had been taken in the last one month upon the administering of the questionnaire. While, Nadir CD4 Count is the baseline CD4 result prior to the commencement of HAART.

1.8.6 Depression

I. Conceptual definition

According to DSM V, Depression is a common and serious medical illness that negatively affects how you feel, the way you think and how you act, loss of interest or pleasure in daily activities for more than two weeks.

II. Operational definition

The operational definition of depression is based on validated Malay version of Patient Health Questionnaire 2 (PHQ-2) (Spitzer, 1999). The higher the PHQ-2 score indicates that the patient is at higher risk of having depression while lower score indicates a lower risk of having depression.

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