



UNIVERSITI PUTRA MALAYSIA

***KNOWLEDGE, ATTITUDE, PRACTICE OF PAP SMEAR AND THEIR
ASSOCIATED FACTORS AMONG FEMALE STAFF OF UNIVERSITI
SAINS ISLAM MALAYSIA, NILAI***

NUURAIN AMIRAH BINTI MOHD RAZI

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By

NUURAIN AMIRAH BINTI MOHD RAZI

**Dissertation Submitted to the Department of Community Health, Faculty
of Medicine and Health Sciences, Universiti Putra Malaysia, in Fulfilment
of the Requirements for the Degree of Master of Public Health**

August 2017

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Abstract of dissertation presented to the Department of Community Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, in fulfilment of the requirement for the Degree of Master of Public Health

**KNOWLEDGE, ATTITUDE, PRACTICE OF PAP SMEAR AND THEIR
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ISLAM MALAYSIA, NILAI**

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August 2017

Chairman : Dr Rosliza Bt Abdul Manaf
Faculty : Medicine and Health Sciences

Introduction: The poor practice of Pap smear especially in the developing countries has been a longstanding issue and causes high number of cervical cancer cases detected at late stages with poor prognosis. Global Cancer Statistics 2012 estimated a number of 527,600 cervical cancer cases and 265,700 deaths worldwide in 2012; majority were in the developing countries. Inadequate knowledge, awareness, and poor attitude towards Pap smear lead to the low uptake. In Malaysia, the National Health and Morbidity Survey IV reported that Pap smear uptake in Malaysia was only 12.8% in 2011.

Objectives: The aim of this study is to determine the level of knowledge, attitude and practice of Pap smear among Universiti Sains Islam Malaysia (USIM) female staff and their associated factors, which include socio-demographic, socio-economic, lifestyle practice, health, and family factors.

Methodology: A cross sectional study was conducted among married or ever married female staff from seven faculties and the main library of USIM, in Nilai. All eligible staff aged 20 – 65 years old was included in this study. A total of 232 self-administered questionnaires were distributed. Chi-square Test, Fischer Exact Test, and Simple Logistic Regression were used to identify the factors associated with knowledge, attitude and practice of Pap smear among the participants. Binary Logistic Regression was used to determine the predictors of knowledge, attitude and Pap smear practice. All hypothesis tests were two-sided and level of significance was set at 0.05.

Results: The total number of respondents included was 187 and the response rate was 80.95%. The median age of the participants was 36.0 ± IQR 8.0. Half (50.8%) of the

participants were academicians while another half was management staff. The lowest educational background was SPM level, while the highest was PhD. Adequate knowledge on cervical cancer and Pap smear was identified among 48.1% of the study participants. A total of 51.9% participants had positive attitude towards Pap smear, and 65.2% have done Pap smear at least once, of which, 65.6% participants had it done within the past three years. Factors associated with the level of knowledge were some of the variables in lifestyle practices and family factors. Factors associated with level of attitude and practice of Pap smear includes variables in socio-demographic, socio-economic, lifestyle practice, health, and family factors. The predictors of having adequate knowledge were Diploma/Degree educational level (AOR=4.51, 95%CI=1.09-18.62), use of contraceptive method (AOR=4.75, 95%CI=1.60-14.10), and positive attitude towards Pap smear (AOR=2.02, 95%CI=1.02-4.00). Predictors of positive attitude towards the test includes receiving husband's support (AOR=2.36, 95%CI=1.09-5.08), having adequate level of knowledge (AOR=2.29, 95%CI=1.12-4.67), and have done Pap smear (AOR=4.34, 95%CI=1.95-9.67). Lastly, the predictors of Pap smear practice were higher number of children (AOR=5.83, 95%CI=1.73-19.61), attending annual medical check-up (AOR=3.07, 95%CI=1.33-7.09), receiving husband support (AOR=2.51, 95%CI=1.14-5.53), and having positive attitude (AOR=4.89, 95%CI=2.22-10.79).

Conclusion: Higher percentage of respondents who have ever did Pap smear were found as compared to many other studies in Malaysia, however the level of knowledge and attitude were still not satisfying. There was still low level of knowledge with misconception on cervical cancer and perceived barrier on Pap smear. Therefore, effective health education, and new recruitment strategies on Pap smear among women should be planned and implemented to promote early detection of cervical cancer and better prognosis.

Keywords: Pap smear, Cervical cancer screening, Cervical cancer, University staff

Abstrak disertasi yang dikemukakan kepada Jabatan Kesihatan Komuniti, Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia, sebagai memenuhi keperluan untuk Ijazah Sarjana Kesihatan Awam

**PENGETAHUAN, SIKAP, AMALAN PAP SMEAR DAN FAKTOR-FAKTOR
YANG BERKAITAN DI KALANGAN STAF WANITA UNIVERSITI SAINS
ISLAM MALAYSIA, NILAI**

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Pengenalan: Pengamalan Pap smear yang rendah terutamanya di negara-negara yang sedang membangun merupakan isu yang telah lama wujud dan menyebabkan pengesanan kes kanser pangkal rahim di tahap yang lambat dan prognosis yang kurang baik. Global Cancer Statistics 2012 menganggarkan sebanyak 527,600 kes kanser pangkal rahim dan 265,700 kematian secara global pada tahun 2012; majoriti di negara-negara yang sedang membangun. Kurangnya amalan Pap smear ini adalah disebabkan kurangnya pengetahuan, kesedaran, dan sikap terhadap Pap smear. Di Malaysia, menurut kajian selidik Kesihatan dan Penyakit Kebangsaan 2011, pengambilan Pap smear pada tahun 2011 hanyalah 12.8%.

Objektif: Kajian ini bertujuan untuk menentukan tahap pengetahuan, sikap dan amalan Pap smear di kalangan staf wanita Universiti Sains Islam Malaysia (USIM) dan faktor-faktor yang berkaitan dengannya, termasuk faktor sosio-demografi, sosio-ekonomi, gaya hidup, faktor kesihatan, dan faktor keluarga.

Metodologi: Satu kajian keratan rentas telah dijalankan di kalangan staf wanita yang berkahwin atau pernah berkahwin dari tujuh fakulti serta perpustakaan di USIM, Nilai. Kesemua staf wanita yang layak, berumur 20 - 65 tahun dipilih untuk menyertai kajian ini. Sebanyak 232 borang kaji selidik telah diedarkan. Ujian Chi-Square, Ujian Fischer's Exact dan Simple Logistik Regresi telah dijalankan untuk mengenalpasti faktor-faktor yang berhubungkait dengan pengetahuan, sikap dan amalan Pap smear. Binary Logistik Regresi telah digunakan untuk menentukan faktor peramalan tahap pengetahuan, sikap dan amalan Pap smear. Semua ujian hipotesis adalah dua belah bahagian dan tahap signifikan ditetapkan pada 0.05.

Keputusan: Jumlah bilangan responden adalah 187 dan kadar respon adalah 80.95%. Median umur peserta kajian adalah $36.00 \pm \text{IQR } 8.00$. Separuh (50.8%) daripada peserta merupakan ahli akademik manakala separuh lagi merupakan staf pengurusan. Tahap pengetahuan yang mencukupi dikenalpasti di kalangan 48.1% peserta kajian. Sebanyak 51.9% responden mempunyai sikap yang positif terhadap Pap smear, dan sebanyak 65.2% pernah menjalani ujian Pap smear, di mana 65.6% daripada peserta menjalani ujian tersebut dalam masa tiga tahun yang lepas. Faktor-faktor yang berkaitan dengan tahap pengetahuan merupakan beberapa pembolehubah daripada faktor gaya hidup dan faktor keluarga. Faktor-faktor yang berkaitan dengan sikap dan amalan Pap smear termasuklah beberapa pembolehubah daripada faktor sosio-demografi, sosio-ekonomi, gaya hidup, faktor kesihatan, dan faktor keluarga. Faktor peramalan untuk mempunyai tahap pengetahuan yang mencukupi merupakan mereka yang mempunyai Ijazah Diploma/ Sarjana Muda (AOR=4.51, 95%CI=1.09-18.62), menggunakan kaedah perancang keluarga (AOR=4.75, 95%CI=1.60-14.10), dan mereka yang mempunyai sikap yang positif terhadap Pap smear (AOR=2.02, 95%CI=1.02-4.00). Faktor peramalan untuk sikap yang positif terhadap Pap smear adalah mereka yang mendapat sokongan daripada suami (AOR=2.36, 95%CI=1.09–5.08), mempunyai tahap pengetahuan yang mencukupi (AOR=2.29, 95%CI=1.12–4.67), dan pernah melakukan ujian Pap smear (AOR=4.34, 95%CI=1.95–9.67). Yang terakhir, faktor peramalan bagi amalan Pap smear adalah jumlah anak yang lebih tinggi (AOR=5.83, 95%CI=1.73-19.61), menjalani saringan kesihatan secara tahunan (AOR=3.07, 95%CI=1.33-7.09), mendapat sokongan daripada suami (AOR=2.51, 95%CI=1.14-5.53), serta mempunyai sikap yang positif terhadap Pap smear (AOR=4.89, 95%CI=2.21-10.79).

Kesimpulan: Peratusan responden yang pernah melakukan ujian Pap smear didapati lebih tinggi berbanding kebanyakan kajian-kajian lain di Malaysia, namun tahap pengetahuan dan sikap terhadap Pap smear masih tidak memuaskan. Tahap pengetahuan masih rendah dan terdapat salah tanggapan terhadap kanser pangkal rahim dan Pap smear, serta tanggapan halangan terhadap amalan Pap smear. Oleh yang demikian, program pendidikan kesihatan yang efektif dan strategi baru untuk menggalakkan wanita menjalani ujian Pap smear perlu dirancang dan dijalankan untuk menggalakkan pengesanan awal kanser pangkal rahim dan prognosis yang lebih baik.

Kata-kata Kunci: Pap smear, Saringan Kanser pangkal rahim, Kanser pangkal rahim, Staf Universiti

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I certify that a Thesis Examination Committee has met on 2nd August 2017 to conduct the final examination of Nuurain Amirah Binti Mohd Razi on her thesis entitled “Knowledge, Attitude, Practice of Pap Smear and Their Associated Factors Among Female Staff of Universiti Sains Islam Malaysia, Nilai” 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 Public Health.

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TABLE OF CONTENTS

ABSTRACT	Page
ABSTRAK	i
ACKNOWLEDGEMENTS	iii
APPROVAL	v
DECLARATION	vi
TABLE OF CONTENTS	viii
LIST OF TABLES	x
LIST OF FIGURES	xiii
LIST OF APPENDICES	xv
LIST OF ABBREVIATIONS	xvi
	xvii

CHAPTER

1	INTRODUCTION	1
	1.1 Background	1
	1.2 Problem Statement	3
	1.3 Study Justification	4
	1.4 Research Questions	5
	1.5 Research Objectives	5
	1.5.1 General Objectives	5
	1.5.2 Specific Objectives	5
	1.6 Research Hypothesis	6
2	LITERATURE REVIEW	7
	2.1 Epidemiology of Cervical Cancer	7
	2.1.1 Global Distribution of Cervical Cancer	7
	2.1.2 Regional Distribution of Cervical Cancer	8
	2.1.3 Cervical Cancer Distribution in Malaysia	10
	2.2 Cervical Cancer Screening Method	10
	2.2.1 Pap smear Test	10
	2.2.2 Liquid Based Cytology (LBC)	11
	2.2.3 Human Papilloma Virus (HPV) Testing	12
	2.2.4 Visual Inspection of Cervix with Lugol's Iodine or Acetic Acid	12
	2.2.5 Self – administered cervical screening (Kato's device)	13
	2.2.6 Automated Cervical Screening Techniques	13
	2.3 Cervical Cancer Screening In Malaysia	13
	2.3.1 Objectives and methods of screening	13
	2.3.2 Uptake of Pap smear Screening	14
	2.4 Knowledge of cervical cancer and Pap smear	14
	2.5 Attitude towards Pap smear	17
	2.6 Pap smear practice	20
	2.7 Other related factors associated	25
	2.8 Challenges and Barriers to Screening in Malaysia	25
	2.9 Conceptual Framework	26

3	METHODOLOGY	28
3.1	Study Location	28
3.2	Study Design	28
3.3	Study Duration	28
3.4	Study Population	28
3.5	Sampling	29
3.5.1	Sampling Population	29
3.5.2	Selection Criteria	29
3.5.3	Sampling frame	29
3.5.4	Sampling Unit	30
3.5.5	Sample Size Estimation	30
3.5.6	Sampling Method	32
3.6	Study Instrument	32
3.6.1	Quality Control	32
3.7	Variables & Operational Definitions	33
3.7.1	Dependent Variables	33
3.7.2	Independent Variables	33
3.7.3	Operational definition	34
3.8	Data Collection Process	36
3.9	Data Analysis	37
3.10	Ethical Consideration	37
4	RESULT	38
4.1	Response Rate	38
4.2	Normality Testing	39
4.3	Descriptive Analysis	40
4.3.1	General characteristics of respondents	40
4.3.2	Knowledge on Cervical cancer and Pap smear	43
4.3.3	Attitude towards Pap smear	45
4.3.4	Practice of Pap smear	47
4.4	Associations between socio-demographic, socio-economic, lifestyle practice, health factors, family factors, and level of knowledge	48
4.5	Associations between socio-demographic, socio-economic, lifestyle practice, health factors, family factors, knowledge and level of attitude towards Pap smear	51
4.6	Associations between socio-demographic, socio-economic, lifestyle practice, family factors, health factors, knowledge, attitude towards Pap smear and practice of Pap smear	54
4.7	Predictors of knowledge on cervical cancer and Pap smear, attitude on Pap smear, and Pap smear practice among USIM female staff.	57

5	DISCUSSION	66
5.1	Level of knowledge on cervical cancer and Pap smear	66
5.2	Level of attitude towards Pap smear	67
5.3	Pap smear practice	67
5.4	Factors associated with Pap smear knowledge, attitude and practice	68
5.4.1	Socio-demographic	68
5.4.2	Socio-economic status	71
5.4.3	Lifestyle practice	72
5.4.4	Health factors	73
5.4.5	Family factors	73
5.4.6	Knowledge, attitude and practice	73
5.5	Predictors of Level of Knowledge, Attitude and Practice of Pap smear	75
5.5.1	Predictors of Adequate Knowledge on cervical cancer and Pap smear	75
5.5.2	Predictors of Positive Attitude towards Pap smear	75
5.5.3	Predictors of Pap smear Practice	76
6	CONCLUSION AND RECOMMENDATION	78
6.1	Conclusion	78
6.2	Study Limitation	78
6.3	Study Strength	79
6.4	Recommendation	79
	APPENDICES	89
	REFERENCES	81
	BIODATA OF STUDENT	114

LIST OF TABLES

Table	Page
3.1 Number of USIM female staff from seven faculties and library	29
3.2 Minimum sample size using different variables	31
3.3 Operational definition of independent and dependent variables	34
4.1 Distribution of respondent's socio-demographic and socio-economic backgrounds (N= 187)	41
4.2 Distribution of respondents' lifestyle practice, health and family factors (N= 187)	42
4.3 Frequency and percentage distribution of respondents by knowledge item on Cervical cancer (N= 187)	44
4.4 Frequency and percentage distribution of respondents by knowledge item on Pap smear (N= 187)	45
4.5 Frequency and percentage distribution on level of knowledge among respondents (N= 187)	45
4.6 Frequency and percentage distribution of respondents attitude towards Pap smear (N= 187)	46
4.7 Frequency and percentage distribution on level of attitude among respondents (N= 187)	47
4.8 Frequency and percentage distribution on practice of Pap smear among respondent (N= 122)	47
4.9 Frequency and percentage distribution on reason of never had Pap smear done (N= 65)	48
4.10 Association between socio-demographic and socio- economic factors of respondents with Level of Knowledge on Cervical cancer and Pap smear (N= 187)	49
4.11 Association between lifestyle practice, health factors, family factors, and Level of Knowledge on Cervical cancer and Pap smear (N= 187)	50
4.12 Association between socio-demographic and socio- economic factors of respondents with level of attitude towards Pap smear (N= 187)	52
4.13 Association between lifestyle practice, health factors, family factors, level of knowledge, and level of attitude towards Pap smear (N= 187)	54

4.14	Association between socio-demographic and socio- economic factors of respondents with practice of Pap smear (N= 187)	55
4.15	Association between lifestyle practice, health factors, family factors, level of knowledge, level of attitude and Practice of Pap smear (N= 187)	57
4.16	Simple Logistic Regression on factors associated with level of knowledge	58
4.17	Predictors of adequate knowledge among USIM female staff	59
4.18	Simple Logistic Regression on factors associated with level of attitude	60
4.19	Predictors of positive attitude towards Pap smear among USIM female staff	62
4.20	Simple Logistic Regression on factors associated with Pap smear practice	63
4.21	Predictors of Pap smear practice among USIM female staff	64

LIST OF FIGURES

Figure		Page
2.1	Age-standardised incidence rates of cervical cancer in Malaysia across South-Eastern Asia (estimates for 2012)	9
2.2	Age-standardised cervical cancer mortality rates in Malaysia and countries within South-Eastern Asia (estimates for 2012)	9
2.3	Conceptual framework on factors associated with Knowledge, Attitude and Practice of Pap smear	27
4.1	Flowchart of respondents' recruitment	39
4.2	Percentage distribution of respondents' occupation (N=187)	40

LIST OF APPENDICES

Appendix		Page
A	Sample Size Calculation	89
B1	Approval Letter from JKEUPM	92
B2	Approval Letter from JKPFPSK USIM	93
C1	Questionnaire in Bahasa Melayu	94
C2	Questionnaire in English	103
D	Graphical Distribution of Normality Testing for Continuous Variables	112

LIST OF ABBREVIATIONS

AOR	Adjusted Odds Ratio
ASR	Age-Standardized Incidence Rate
CI	Confidence Interval
df	Degree of Freedom
PhD	Doctor of Philosophy
HPV	Human Papillomavirus
IQR	Interquartile Range
IUD	Intrauterine Device
JKEUPM	Jawatankuasa Etika Universiti untuk Penyelidikan Melibatkan Manusia UPM
JKPFPSK	Jawatankuasa Penyelidikan Fakulti Perubatan dan Sains Kesihatan USIM
LBC	Liquid Based Cytology
MOH	Ministry of Health
NCR	National Cancer Registry
NHMS	National Health and Morbidity Survey
OR	Odds Ratio
SD	Standard Deviation
SPM	Sijil Pelajaran Malaysia
SPSS	Statistical Package for the Social Sciences
UPM	Universiti Putra Malaysia
USIM	Universiti Sains Islam Malaysia
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

This chapter describes the background of cervical cancer and Pap smear globally and locally. It will then be followed by problem statement, study justification and research questions. Research objectives and hypotheses are then being stated in the later section of this chapter.

1.1 Background

Cervical cancer is one of the serious health problems among women leading to a high morbidity worldwide. However, it is also one of the most preventable cancers as it can be detected at early stage or even before its cancerous stage. Decades of studies have confirmed its natural history of slow disease progression, enabling it to be detected early. Unfortunately, many of the affected women sought treatment at advanced stages because the symptoms commonly appear late, thus contributing to a high mortality rate.

Globally, there was an estimated of more than half a million new cervical cancer cases, which about half of these cases resulted to deaths in 2012. Cervical cancer was the second most commonly diagnosed cancer, and the third leading cause of cancer death among women in less developed countries, where about 90% of the death occurred (Torre et al., 2015).

Since cervical cancer has been an alarming issue worldwide for many years back, various preventive strategies and treatment protocols were developed to combat the disease (Blumenthal & McIntosh, 2008; Hong Kong College of Obstetricians and Gynaecologists, 2016; Jeronimo et al., 2016; Ministry of Health Malaysia (MOH), 2003; Silvina Arrossi et al., 2017; World Health Organisation, 2014; World Health Organization, 2013b). Up till today, many strategies have been done at different stage of prevention level such as the Human Papillomavirus (HPV) vaccination for primary prevention strategies, and various methods of cervical cancer screening for the secondary preventive strategies as in the protocols and guidelines.

The HPV vaccine is aimed to reduce the incidence of cervical cancer as HPV infection are known to be strongly associated with cervical cancers. Many studies found that more than 90% of cervical cancers cases are related to persistent infection of HPV (Agorastos et al., 2014; Castle et al., 2011; Arbyn et al., 2012). The vaccines are targeted to the teenagers' population. World Health Organization (WHO) recommends routine vaccination of girls 9-13 years of age because they are less likely to have begun sexual activity, which may exposed them to the infection (WHO, 2013).

Meanwhile, the secondary prevention strategies are aimed to detect cervical cancer at its very early stage or even before the cancer developed. The most commonly used

screening method to detect the cancer since nearly a century ago is by Papanicolaou smear test, a cervical smear test named after its inventor (Mammas & Spandidos, 2012). Since 1920s, cervical cancer smear was studied by a Greek doctor, Dr George Papanicolaou who invented the test, also called as Pap smear test. It was then widely known and used since 1940s for cancer screening method later after he published his first book titled “Diagnosis of Uterine Cancer by the Vaginal Smear” in 1943 (Mammas & Spandidos, 2012). Apart from the Pap smear test, other methods such as liquid based cytology and HPV testing are now among the most advocated tests in certain countries (Duraismy, Jaganathan, & Bose, 2011).

These cervical cancer screening tests are not only able to detect early stages of cancer that enable women to get a highly effective treatment, but it can detect precancerous lesions, which may prevent it from progressing into cancerous stage. WHO has recommended for countries all over the world to ensure that women from 30 – 49 years to be screened at least once during this age, if not regularly as being recommended, as this age group may benefit most from the test (World Health Organization, 2013b).

Overtime, with the practice of Pap smear test, the incidence and mortality rate due to cervical cancer has then reduced worldwide. Nevertheless, it was found that the reduction was mainly in the developed country while the developing country has risen or remain the same (World Health Organization, 2014). The incidence rate of cervical cancer in developed country such as in United Kingdom has decreased by 44% since 1970s (Cancer Research UK, 2014). In the United States, the incidence rate of cervical cancer reduced by 50% between 1975 to 2012 with incidence rate of 14.8 per 100,000 and 6.7 per 100,000 respectively, primarily due to the uptake of screening test (American Cancer Society, 2016).

In Malaysia, Pap smear test is one of the cervical screening methods available. It has been introduced since the 1960s following the integration of family planning services into Maternal and Child Health Programme of Ministry of Health (MOH) Malaysia (Baharom & Ismail, 2008), and was made free of charge in the government’s primary care facilities since 1995 (Zaridah, 2014). The test is aimed for women between age 20 – 65 years, who are and have been sexually active. Women are recommended to attend the test yearly for the first two consecutive years and every three years if the initial results were normal (Ministry of Health, 2004).

The incidence rate of cervical cancer in Malaysia has also been observed to reduced to an incidence rate of 7.6 per 100,00 women over five years between 2007 to 2011 (Azizah, Saleha, Hashimah, Asmah, & Mastulu, 2016). However, high percentages (40%) of the cases were detected late. This could have been prevented if early screening has been practiced.

Nevertheless, early screening would not be successful without the awareness from the public, especially the women. Since awareness is being influenced by knowledge (Littlejohn, 2015), the important role of ensuring women to be aware of cervical cancer and Pap smear through knowledge laid in. While the extent of knowledge further

influences the attitude of women towards Pap smear (Bahri, Jajvandian, Bolandhemmat, & Najmabadi, 2015), it is also important to embrace positive attitude towards the test, as it might helps in achieving high utilisation of Pap smear among women since attitude and practice were found to be importantly related (Rezaie-Chamani, Mohammad-Alizadeh, & Kamalifard, 2012). Hence, the issues on knowledge, attitude, and practice towards Pap smear should be addressed and highlighted among the communities at the local level as well as the national level in improving cervical cancer screening and detection to reduce the country's morbidity and mortality rate.

1.2 Problem Statement

According to the Global Cancer Statistic (Globocan) 2012, cervical cancer has become no more in the list of top ten commonest cancer occurring among women in developed country, and is far below as the ninth cause of death, with an estimated of 35,500 deaths. Whereas in less developed country, it is the second most frequently diagnosed cancer, and the third cause of cancer death among female, with an estimated 444,500 cases and 230,200 deaths (Torre et al., 2015). As Pap smear has been widely utilized in the developed country, the precancerous and early stage of cancer is able to be treated earlier, thus preventing the cancer occurrence and death.

In Malaysia, based on Malaysia National Cancer Registry (NCR) 2007 report, cancer of cervix is the fifth most common cancer among Malaysian population and is the third most commonly cancer occurring in female. Despite the readily accessible Pap smear test in Malaysia health care facilities, nearly half of the cases were detected at an advanced stage; 25.6% at stage 3 and 18.7% at stage 4 (Omar & Tamin, 2007). Meanwhile, the subsequent NCR report published disclosed only a slight decrease of late detection; 22% at stage 3 and 18% at stage 4 (Azizah et al., 2016). Among the reasons of late detection would probably be due to the late presentation of Malaysian women to healthcare facilities and also poor uptake of Pap smear.

On the issue of uptake among Malaysian women, previously National Health and Morbidity Survey (NHMS) III reported an increased of about 20% on the prevalence of Pap smear uptake among women aged 20 years and above, that was from 26% in 1996 to 45.7% in 2006. The achievement was most probably attributed to the launching of Healthy Lifestyle Campaign with the theme of 'Cancer' in 1995 (Institute for Public Health, 2008). Nevertheless, later in year 2011, NHMS IV reported a drastic reduction of Pap smear uptake prevalence, of only 12.8% among women aged 18 years and above, as compared to 43.7% in year 2006 (Institute for Public Health, 2008; Institute of Public Health, 2011). One of the plausible reasons to the downtrend prevalence after year 2006 could be due to the declining sustainability of the campaign.

From many local studies among Malaysian women, the overall uptake of Pap smear was also found not satisfying (Asmani & Aziah, 2007; Al-naggar & Chen, 2012; Abdullah, Al-Kubaisy, & Mokhtar, 2013; Gan & Dahlui, 2013). Among the problems leading to poor uptake identified were lacking of knowledge and awareness on cervical cancer, its risk factors, as well as knowledge on Pap smear test (Al-naggar & Chen,

2012; Al-Naggar, Low, & Isa, 2010; Gan & Dahlui, 2013). Apart from knowledge, the unfavourable attitude towards cervical cancer and Pap smear was also reported, which may contribute to the non-uptake or the non-compliance to the screening interval (Abdullah et al., 2013; Baskaran et al., 2013; Farooqui et al., 2011; Wong, Wong, Low, Khoo, & Shuib, 2009).

1.3 Study Justification

Cervical cancer is known as a preventable disease where majority of cases are due to chronic infection of high-risk type HPV. The natural history of HPV infection caused a very slow progression of disease in women, from normal condition to any of the precancerous stages; Cervical intraepithelial neoplasia (CIN) 1, CIN2, or CIN3, and to invasive cancer. Considering the lengthy time which can take about several years for transformation process to occur from precancerous to cancer in an individual, it offers an ample time to detect the disease early, thus preventing its progression to cancer.

Diagnosing cervical cancer at the very early stage provide longer survival rates when treated. In the earliest stage of IA, the 5-years survival rate is up to 95% while stage IB1 has approximately 90% of 5-years survival rates (Straughn & Yashar, 2016). Malaysia generally has relatively good overall 5-year survival rate among patients with cervical cancer as compared to developed nations (Muhamad et al., 2015). Thus, it is very essential to detect the disease early in our community by doing regular Pap smear as recommended by MOH to prevent the complication and mortality from the disease.

In ensuring regular practice, it requires awareness along with good knowledge and attitude towards Pap smear. However, the inadequate knowledge and attitude found among Malaysian women as described earlier shows consistency with their poor practice. Considering the lack of awareness on the disease and its screening test despite the readily available cancer prevention program in Malaysia, it is very important to explore the knowledge, attitude, and practice of Pap smear especially among the working women, as many Malaysian women are working nowadays, evidenced by the rising Malaysia's Female Labour Force Participation Rate (LFPR) each year (Department of Statistics Malaysia, 2016).

When looked into the prevalence of Pap smear uptake across major ethnic groups in Malaysia, Malays are the less likely (11.4%) to go for Pap smear test as compared to Chinese (16.3%) and Indians (12.9%), according to the NHMS IV Report (Institute of Public Health, 2011). Taking these factors into consideration, this study is selected to be done among working women in a public university, namely Universiti Sains Islam Malaysia (USIM), which majority of them are of Malay ethnicity. This is to assess their level of knowledge, attitude and practice towards the test.

It is hoped that awareness on Pap smear is created among the community involved, and the study might be important and beneficial for future intervention in USIM community towards improving their knowledge as well as cultivating good attitude and practice on Pap smear test, which could help if not at all, any increment of the overall

Pap smear uptake prevalence in the country. Perhaps it would also be useful in the future by providing some information to the health service providers, policy makers and other health-related organization to embark new strategies in educating the working society to increase their awareness, hence the practice.

1.4 Research Questions

- i. What is the level of knowledge on Pap smear test among USIM female staff?
- ii. What is the level of attitude on Pap smear test among USIM female staff?
- iii. What is the practice of Pap smear test among USIM female staff?
- iv. Is there any association between the socio-demographic, socio-economic factors, lifestyle practice, family, and health factors of USIM female staff with the knowledge, attitude and practice of Pap smear test?
- v. Is there any association between knowledge, attitude and practice of Pap smear among USIM female staff?
- vi. What are the predictors of adequate knowledge, positive attitude and practice of Pap smear among USIM female staff?

1.5 Research Objectives

1.5.1 General Objectives

To determine the level of knowledge, attitude and practice of Pap smear test among USIM female staff and their associated factors.

1.5.2 Specific Objectives

- i. To describe the socio-demographic and socio-economic factors, lifestyle practice, family, and health factors among the respondents.
- ii. To determine the level of knowledge on cervical cancer and Pap smear among respondents and its association with socio-demographic and socio-economic factors, lifestyle practice, family and health factors.
- iii. To determine the level of attitude towards Pap smear among respondents and its association with socio-demographic and socio-economic factors, lifestyle practice, family and health factors, and knowledge on cervical cancer and Pap smear.

- iv. To determine the practice of Pap smear among respondents and its association with socio-demographic and socio-economic factors, lifestyle practice, family and health factors, knowledge, and attitude towards Pap smear.
- v. To determine the predictors of adequate knowledge, positive attitude and practice of Pap smear among USIM female staff.

1.6 Research Hypothesis

- i. There is a significant association between socio-demographic and socio-economic factors, lifestyle practice, family and health factors with level of knowledge on cervical cancer and Pap smear.
- ii. There is a significant association between socio-demographic and socio-economic factors, lifestyle practice, family and health factors, and knowledge with level of attitude towards Pap smear.
- iii. There is a significant association between socio-demographic and socio-economic factors, lifestyle practice, family and health factors, knowledge, and attitude with practice of Pap smear.

REFERENCES

- Abdullah, F., Aziz, N. Abdul, & Su, T. T. (2011). Factors Related to Poor Practice of Pap smear Screening among Secondary School Teachers in Malaysia. *Asian Pacific Journal of Cancer Prevention*, 12(5), 1347–1352.
- Abdullah, N. N., Al-Kubaisy, W., & Mokhtar, M. M. (2013). Health Behaviour Regarding Cervical Cancer Screening Among Urban Women in Malaysia. *Procedia - Social and Behavioral Sciences*, 85, 110–117.
- Agorastos, T., Chatzistamatiou, K., Zafrakas, M., Siamanta, V., Katsamagkas, T., Constantinidis, T. C., & Lampropoulos, A. F. (2014). Epidemiology of HPV infection and current status of cervical cancer prevention in Greece: final results of the LYSISTRATA cross-sectional study. *European Journal of Cancer Prevention: The Official Journal of the European Cancer Prevention Organisation (ECP)*, 23(5), 425–31.
- Akinyemiju, T. F. (2012). Socio-Economic and Health Access Determinants of Breast and Cervical Cancer Screening in Low-Income Countries: Analysis of the World Health Survey. *PLoS ONE*, 7(11), 3–10.
- Al-naggar, R. A., & Chen, R. (2012). Practice and Barriers towards Cervical Cancer Screening among University Staff at a Malaysian University. *Journal of Community Medicine & Health Education*, 2(1), 1–7.
- Al-Naggar, R. A., Low, W. Y., & Isa, Z. M. (2010). Knowledge and barriers towards cervical cancer screening among young women in Malaysia. *Asian Pacific Journal of Cancer Prevention*, 11(4), 867–873.
- Al Sairafi, M., & Mohamed, F. A. (2008). Knowledge, attitudes, and practice related to cervical cancer screening among Kuwaiti women. *Medical Principles and Practice*, 18(1), 35–42.
- American Cancer Society. (2016). *Cancer Facts & Figures 2016*, 23. Retrieved September 2016 from <https://www.cancer.org/research/cancer-facts-statistics/all-cancer-facts-figures/cancer-facts-figures-2016.html>
- Arbyn, M., Bergeron, C., Klinkhamer, P., Martin-Hirsch, P., Siebers, A. G., & Bulten, J. (2008). Liquid compared with conventional cervical cytology: a systematic review and meta-analysis. *Obstetrics and Gynecology*, 111(1), 167–77.
- Arbyn, M., Ronco, G., Anttila, A., Meijer, C. J. L. M., Poljak, M., Ogilvie, G., ... Peto, J. (2012). Evidence regarding human papillomavirus testing in secondary prevention of cervical cancer. *Vaccine*, 30 Suppl 5, F88-99.
- Azizah, A. M., Saleha, I. . N., Hashimah, A. N., Asmah, Z. ., & Mastulu, W. (2016). *Malaysian National Cancer Registry Report 2007-2011*. Ministry of Health Malaysia
- Baharom, A., & Ismail, M. (2008). Case Studies on Decision for Cervical Cancer Screening among Working Women. *The Journal of Human Resources and Adult Learning*, 4(2), 173–184.

- Bahri, N., Jajvandian, R., Bolandhemmat, M., & Najmabadi, K. M. (2015). Knowledge, attitudes and practice about pap smear test among women living in Bojnourd, North East of Iran: A population-based study. *Asian Pacific Journal of Cancer Prevention*, 16(5), 2013–2018.
- Bakheit, N. M., & Haroon, A. I. B. (2004). the Knowledge , Attitude and Practice of Pap Smear Among Local School Teachers in the Sharjah. *Middle East Journal of Family Health Medicine*, 4(4).
- Baskaran, P., Subramanian, P., Rahman, R. A., Ping, W. L., Mohd Taib, N. A., & Rosli, R. (2013). Perceived susceptibility, and cervical cancer screening benefits and barriers in malaysian women visiting outpatient clinics. *Asian Pacific Journal of Cancer Prevention*, 14(12), 7693–7699.
- Blumenthal, P. D., & McIntosh, N. (2008). *Cervical Cancer Prevention Guidelines for Low-Resource Settings*. (S. Crump, S. Elabd, & D. Lewison, Eds.). John Hopkins University.
- Bruni, L., Barrionuevo-Rosas, L., Albero, G., Aldea, M., Serrano, B., Valencia, S., ... Castellsagué, X. (2016a). Human Papillomavirus and Related Diseases Report. *HPV Centre*, (Afghanistan), iii. Retrieved from http://www.who.int/cancer/country-profiles/khm_en.pdf.
- Bruni, L., Barrionuevo-Rosas, L., Albero, G., Aldea, M., Serrano, B., Valencia, S., ... Castellsagué, X. (2016b). *Human Papillomavirus and Related Diseases Report in Indonesia*. *ICO Information Centre on HPV and Cancer (HPV Information Centre)*. Retrieved from www.hpvcentre.com
- Bruni, L., Barrionuevo-Rosas, L., Albero, G., Aldea, M., Serrano, B., Valencia, S., ... Castellsagué, X. (2016c). *Human Papillomavirus and Related Diseases Report in Singapore*. Retrieved from www.hpvcentre.com
- Cancer Research UK. (2014). Cancer mortality statistics | Cancer Research UK. Retrieved from <http://www.cancerresearchuk.org/health-professional/cancer-statistics/mortality>
- Castle, P. E., Stoler, M. H., Wright, T. C., Sharma, A., Wright, T. L., & Behrens, C. M. (2011). Performance of carcinogenic human papillomavirus (HPV) testing and HPV16 or HPV18 genotyping for cervical cancer screening of women aged 25 years and older: A subanalysis of the ATHENA study. *The Lancet Oncology*, 12(9), 880–890.
- Charakorn, C., Rattanasiri, S., Lertkhachonsuk, A., & Thanappapasr, D. (2011). Knowledge of Pap smear , HPV and the HPV vaccine and the acceptability of the HPV vaccine by Thai women. *Asia Pacific Journal of Oncology*, (7), 160–167.
- Chee, H., Rashidah, S., Shamsuddin, K., & Intan, O. (2003). Factors related to the practice of breast self examination (BSE) and Pap smear screening among Malaysian women workers in selected electronics factories. *BMC Women ' S Health*, 11(3:3).

- Department of Health Hong Kong. (2016). *Statistics of Cervical Cancer*. Surveillance and Epidemiology Branch. The Government of the Hong Kong Special Administrative Region. Retrieved from <http://www.cervicalscreening.gov.hk/eindex.php>
- Department of Statistics Malaysia. (2016). *Press Release Labour Force Survey Report , Malaysia , 2016*.
- Donati, S., Giambi, C., Declich, S., Salmaso, S., Filia, A., Atti, M. L. C. degli, ... Di Pierro, C. (2012). Knowledge, attitude and practice in primary and secondary cervical cancer prevention among young adult Italian women. *Vaccine*, 30(12), 2075–2082.
- Duraisamy, K., Jaganathan, K. S., & Bose, J. C. (2011). Methods of Detecting Cervical Cancer. *Advances in Biological Research*, 5(4), 226–232.
- Engholm G, Ferlay J, Christensen N, Kejs AMT, Hertzum-Larsen R, Johannesen TB, Khan S, Leinonen MK, Ólafsdóttir E, Petersen T, Schmidt LKH, Trykker H, S. H. (2016). NORDCAN: Cancer Incidence, Mortality, Prevalence and Survival in the Nordic Countries. Association of the Nordic Cancer Registries. Danish Cancer Society. Retrieved from <http://www.anccr.nu>
- Farooqui, M., Hassali, M. A., Shatar, A. K., Shafie, A. A., Seang, T. B., & Farooqui, M. A. (2011). A qualitative exploration of Malaysian cancer patients' perspectives on cancer and its treatment. *BMC Public Health*, 11(1), 525.
- Gamarra, C. J., Paz, E. P. A., & Griep, R. H. (2005). Knowledge , attitudes and practice related to Papanicolaou smear test among Argentina ' s women. *Revista de Saude Publica*, 39(March 2004), 270–276.
- Gan, D. E. H., & Dahlui, M. (2013). Cervical screening uptake and its predictors among rural women in malaysia. *Singapore Medical Journal*, 54(3), 163–168.
- Gu, C., Chan, C. W. ., He, G. P., Choi, K. C., & Yang, S. B. (2013). Chinese women's motivation to receive future screening: The role of social-demographic factors, knowledge and risk perception of cervical cancer. *European Journal of Oncology Nursing*, 17(2), 154–161.
- Gu, C., Chan, C. W. H., Twinn, S., & Choi, K. C. (2012). The influence of knowledge and perception of the risk of cervical cancer on screening behavior in mainland Chinese women. *TT -. Psycho - Oncology*, 21(12), 1299–1308.
- Hanisch, R., Gustat, J., Hagensee, M. E., Baena, A., Salazar, J. E., Castro, M. V., ... Sánchez, G. I. (2008). Knowledge of Pap screening and human papillomavirus among women attending clinics in Medellin, Colombia. *International Journal of Gynecological Cancer*, 18(5), 1020–1026.
- Head, S. K., Crosby, R. A., & Moore, G. R. (2009). Pap Smear Knowledge Among Young Women Following the Introduction of the HPV Vaccine. *Journal of Pediatric and Adolescent Gynecology*, 22(4), 251–256.

- Hong Kong College of Obstetricians and Gynaecologists. (2016). *Guidelines for Cervical Cancer Prevention and Screening published.*
- Hosmer, D. W., & Lemeshow, S. (2000). *Applied Logistic Regression. Wiley Series in Probability and Statistics.*
- Institute for Public Health. (2008). *The Third National Health and Morbidity Survey (NHMS)2006: Women's Health. Ministry of Health Malaysia.*
- Institute of Public Health. (2011). *National Health and Morbidity Survey 2011. Ministry of Health Malaysia.*
- Jeronimo, J., Castle, P. E., Temin, S., Denny, L., Gupta, V., Kim, J. J., ... Shastri, S. S. (2016). Secondary Prevention of Cervical Cancer : ASCO Resource-Stratified Clinical Practice Guideline. *Journal of Global Oncology, JGO006577.*
- Kangmennaang, J., Thogarapalli, N., Mkandawire, P., & Luginaah, I. (2015). Investigating the disparities in cervical cancer screening among Namibian women. *Gynecologic Oncology, 138*(2), 411–416.
- Kerkar, R. a, & Kulkarni, Y. V. (2006). Screening for cervical cancer : an overview. *Obstetrics & Gynecology, 56*(2), 115–122.
- Kim, J. J., Wright, T. C., & Goldie, S. J. (2005). Cost-effectiveness of human papillomavirus DNA testing in the United Kingdom, The Netherlands, France, and Italy. *Journal of the National Cancer Institute, 97*(12), 888–895.
- Lartey, M., Joubert, G., & Cronje, H. S. (2003). Knowledge, attitudes and practices of rural women in South Africa regarding the Pap smear. *International Journal of Gynecology and Obstetrics, 83*(3), 315–316.
- Liao, C. C., Wang, H. Y., Lin, R. S., Hsieh, C. Y., & Sung, F. C. (2006). Addressing Taiwan's high incidence of cervical cancer: Factors associated with the Nation's low compliance with Papanicolaou screening in Taiwan. *Journal of the Royal Institute of Public Health, 120*(12), 1170–1176.
- Littlejohn, C. (2015). Knowledge and Awareness. *Analysis, 75*(4), 596–603.
- Lwanga S.K., & Lemeshow S. (1991). Sample size determination in health studies A practice manual. *World Health Organization.*
- Mammas, I. N., & Spandidos, D. A. (2012). George Papanicolaou.pdf. *Journal of BUON, 17*, 180–184.
- Massad, L. S., Einstein, M. H., Huh, W. K., Katki, H. A., Kinney, W. K., Schiffman, M., ... Lawson, H. W. (2013). 2012 Updated Consensus Guidelines for the Management of Cervical Cancer Screening Test and Cancer Precursors. *American Society for Colposcopy and Cervical Pathology, 17*(5), S1–S27.
- Ministry of Health Malaysia. (2004). *Guidebook for Pap smear screening.* Division of Family Health Department.

- Ministry of Health Malaysia (MOH). (2003). *Clinical Practice Guidelines Management of Cervical Cancer* (Vol. 3).
- Moreira, E. D. J., Oliveira, B. G., Ferraz, F. M., Costa, S., Costa Filho, J. O., & Karic, G. (2006). Knowledge and attitudes about human papillomavirus, Pap smears, and cervical cancer among young women in Brazil: implications for health education and prevention. *International Journal of Gynecological Cancer: Official Journal of the International Gynecological Cancer Society*, 16(2), 599–603.
- Muhamad, N. A., Kamaluddin, M. A., Adon, M. Y., Noh, M. A., Bakhtiar, M. F., Ibrahim, N. S., ... Aris, T. (2015). Survival Rates of Cervical Cancer Patients in Malaysia, 16, 3067–3072.
- Murillo, R., Herrero, R., Sierra, M. S., & Forman, D. (2016). Cervical cancer in Central and South America: Burden of disease and status of disease control. *Cancer Epidemiology*, 44 Suppl 1, S121–S130.
- Murillo, R., Luna, J., Gamboa, O., Osorio, E., Bonilla, J., & Cendales, R. (2010). Cervical cancer screening with naked-eye visual inspection in Colombia. *International Journal of Gynecology and Obstetrics*, 109(3), 230–234.
- Nabandith, V., Pholsena, V., Mounthisone, P., Shimoe, K., Kato, S., Aoki, K., ... Yoshimi, N. (2012). First Trial of Cervical Cytology in Healthy Women of Urban Laos using Self-sampling Instrument. *Asian Pacific Journal of Cancer Prevention*, 13(9), 4665–4667.
- Omar, Z. A., & Tamin, N. S. I. (2007). *National Cancer Registry Report*. National Cancer Registry, Ministry of Health Malaysia.
- Oranratanaphan, S., Amatyakul, P., & Iramaneerat, K. (2010). Knowledge , Attitudes and Practices about the Pap Smear among Medical Workers in Naresuan University Hospital. *Asian Pacific Journal of Cancer Prevention*, 11, 2001–2004.
- Osborne, C., Ostir, G. V., Du, X., Peek, M. K., & Goodwin, J. S. (2005). The influence of marital status on the stage at diagnosis, treatment, and survival of older women with breast cancer. *Breast cancer research and treatment*, 93(1), 41–47.
- Parkin, D. M., & Bray, F. (2006). Chapter 2: The burden of HPV-related cancers. *Vaccine*, 24(SUPPL. 3), 11–25.
- Parkin, D. M., Bray, F., Ferlay, J., & Pisani, P. (2002a). Global cancer statistics, 2002. *CA: A Cancer Journal for Clinicians*, 55(2), 74–108.
- Parkin, D. M., Bray, F., Ferlay, J., & Pisani, P. (2002b). Global cancer statistics, 2002. *CA: A Cancer Journal for Clinicians*, 55(2), 74–108.
- Ranjit, A., Gupta, S., Shrestha, R., Kushner, A. L., Nwomeh, B. C., & Groen, R. S. (2016). Awareness and prevalence of cervical cancer screening among women in Nepal. *International Journal of Gynecology and Obstetrics*, 134(1), 37–40.

- Rashid, R. M. A., Ramli, S., John, J., & Dahlui, M. (2014). Cost effective analysis of recall methods for cervical cancer screening in Selangor--results from a prospective randomized controlled trial. *Asian Pacific Journal of Cancer Prevention : APJCP*, 15(13), 5143–7.
- Raychaudhuri, S., & Mandal, S. (2012). Socio-demographic and behavioural risk factors for cervical cancer and knowledge, attitude and practice in rural and urban areas of North Bengal, India. *Asian Pacific Journal of Cancer Prevention : APJCP*, 13(4), 1093–1096.
- Reis, N., Bebis, H., Kose, S., Sis, A., Engin, R., & Yavan, T. (2012). Knowledge, behavior and beliefs related to cervical cancer and screening among Turkish women. *Asian Pacific Journal of Cancer Prevention*, 13(4), 1463–1470.
- Rezaie-Chamani, S., Mohammad-Alizadeh, S., & Kamalifard, M. (2012). Knowledge, attitudes and practice about pap smear among women referring to a public hospital. *Journal of Family and Reproductive Health*, 6(4), 177–182.
- Saleh, H. S. (2014). Can visual inspection with acetic acid be used as an alternative to Pap smear in screening cervical cancer? *Middle East Fertility Society Journal*, 19(3), 187–191.
- Sangwa-Lugoma, G., Mahmud, S., Nasr, S. H., Liaras, J., Kayembe, P. K., Tozin, R., ... Franco, E. L. (2006). Visual inspection as a cervical cancer screening method in a primary health care setting in Africa. *International Journal of Cancer*, 119(6), 1389–1395.
- Sankaranarayanan, R., Basu, P., Wesley, R. S., Mahe, C., Keita, N., Mbalawa, C. C. G., ... Parkin, D. M. (2004). Accuracy of visual screening for cervical neoplasia: Results from an IARC multicentre study in India and Africa. *International Journal of Cancer*, 110(6), 907–913.
- Sankaranarayanan, R., & Wesley, R. (2003). A Practical Manual on Visual Screening for Cervical Neoplasia, (41), 49.
- Saslow, D., Solomon, D., Lawson, H. W., Killackey, M., Kulasingam, S. L., Cain, J., ... ACS-ASCCP-ASCP Cervical cancer Guideline Committee (2012). (2012). American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. *CA: A Cancer Journal for Clinicians*, 62(3), 147–172.
- Schellekens, M. C., Dijkman, A., Aziz, M. F., Siregar, B., Cornain, S., Kolkman-Uljee, S., ... Fleuren, G. J. (2004). Prevalence of single and multiple HPV types in cervical carcinomas in Jakarta, Indonesia. *Gynecologic Oncology*, 93(1), 49–53.
- Shrestha, P., & Odland, J. Ø. (2014). Knowledge , Attitude, and Practice regarding Pap Smear Test among Women in Ward no . 14 , Dharan. *The Arctic University of norway*.

- Silvina Arrossi, Temin, S., Garland, S., Eckert, L. O., Bhatla, N., 'e†, X. C., ... 'e, S. de S. (2017). Primary Prevention of Cervical Cancer : American Society of Clinical Oncology. *Journal of Global Oncology*, (JGO-2016).
- Snijders, P. J. F., Verhoef, V. M. J., Arbyn, M., Ogilvie, G., Minozzi, S., Banzi, R., ... Meijer, C. J. L. M. (2013). High-risk HPV testing on self-sampled versus clinician-collected specimens: A review on the clinical accuracy and impact on population attendance in cervical cancer screening. *International Journal of Cancer*, 132(10), 2223–2236.
- Straughn, J. M., & Yashar, C. (2016). Cervical cancer treatment; early stage cancer. Retrieved from <http://www.uptodate.com/contents/cervical-cancer-treatment-early-stage-cancer-beyond-the-basics>
- Sudenga, S. L., Rositch, A. F., Otieno, W. A., & Smith, J. S. (2013). Knowledge, attitudes, practices, and perceived risk of cervical cancer among Kenyan women. *International Journal of Gynecological Cancer: Official Journal of the International Gynecological Cancer Society*, 23(5), 895–9.
- Thippeveeranna, C., Surekha, S. M., Devi, K. P., Laiphrakpam, R. S., & Singh, C. M. (2012). O681 Knowledge, Attitude and Practice of Pap Smear As a Screening Procedure Among Nurses in a Tertiary Hospital in North Eastern India. *International Journal of Gynecology & Obstetrics*, 119, S500.
- Torre, L. A., Bray, F., Siegel, R. L., Ferlay, J., Lortet-tieulent, J., & Jemal, A. (2015). Global Cancer Statistics, 2012. *CA: A Cancer Journal of Clinicians.*, 65(2), 87–108.
- Urasa, M., & Darj, E. (2011). Knowledge of cervical cancer and screening practices of nurses at a regional hospital in Tanzania. *African Health Sciences*, 11(1), 48–57.
- Usubütün, A., Alemany, L., Küçükali, T., Ayhan, A., Yüce, K., de Sanjosé, S., ... Bosch, F. X. (2009). Human papillomavirus types in invasive cervical cancer specimens from Turkey. *International Journal of Gynecological Pathology: Official Journal of the International Society of Gynecological Pathologists*, 28(6), 541–8.
- Wang, L. D.-L., Lam, W. W. T., & Fielding, R. (2015). Cervical cancer prevention practices through screening and vaccination: A cross-sectional study among Hong Kong Chinese women. *Gynecologic Oncology*, 138(2), 311–316.
- Wong, L. P., Wong, Y. L., Low, W. Y., Khoo, E. M., & Shuib, R. (2009). Knowledge and awareness of cervical cancer and screening among Malaysian women who have never had a Pap smear: A qualitative study. *Singapore Medical Journal*, 50(1), 49–53.
- World Health Organisation. (2014). *Comprehensive Cervical Cancer Control. WHO Library Cataloguing-in-Publication Data* (Second). Retrieved from <http://www.who.int/reproductivehealth/publications/cancers/cervical-cancer-guide/en/>

World Health Organization. (2013a). *Chapter 4: HPV Vaccination Comprehensive Cervical Cancer Draft*. Retrieved from http://www.who.int/immunization/hpv/plan/hpv_vaccine_intro_guide_c4gep_who_2013.pdf

World Health Organization. (2013b). *Guidelines for screening and treatment of precancerous lesions for cervical cancer prevention*. Retrieved from http://www.who.int/reproductivehealth/publications/cancers/screening_and_treatment_of_precancerous_lesions/en/index.html

World Health Organization. (2014). New WHO guide to prevent and control cervical cancer. Retrieved September 16, 2016, from <http://www.who.int/reproductivehealth/topics/cancers/fight-cervical-cancer/en/#content>

Zaridah, S. (2014). A Review of Cervical Cancer Research in Malaysia. *Med J Malaysia*, 69(August), 33–41.