



UNIVERSITI PUTRA MALAYSIA

***KNOWLEDGE, ATTITUDE AND PRACTICE OF HUMAN PAPILLOMA
VIRUS (HPV) VACCINATION AMONG MEDICAL STUDENTS IN
UNIVERSITI PUTRA MALAYSIA IN YEAR 2013***

**By
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KNOWLEDGE, ATTITUDE AND PRACTICE OF HUMAN PAPILLOMAVIRUS (HPV) VACCINATION AMONG MEDICAL STUDENTS IN UNIVERSITI PUTRA MALAYSIA IN YEAR 2013

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ABSTRACT

Background: In Malaysia, cancer of the cervix was the third most common cancer among women, after breast cancer and colorectal cancer even though the vaccine towards the HPV have been introduced by the Ministry of Health.

Objective: The objective of this study was to determine the level of knowledge, attitude and practise of HPV vaccination among medical students of UPM.

Method: This study was conducted from March 2013 to August 2013. Adopted validated questionnaires were completed by UPM medical students (n=389).

Results: The results showed that majority of the students have good knowledge and showed good attitude towards HPV vaccination. However, most of the students showed poor practise (n=196). Only some of the students had been vaccinated (37.8%) and most of the vaccinated students showed good practise towards HPV vaccination. Among the unvaccinated students (62.2%), most of them stated that they were still unsure whether to get themselves vaccinated in the future. In comparing gender and attitude grades, there was no significant difference between male and female students. There were significant association between the mean rank for attitude scores and year of study.

Conclusions: In conclusion, the medical students in UPM showed good knowledge level and good attitude towards HPV vaccination. However, many students have not been vaccinated and most of them were unsure about getting themselves vaccinated in the future. Therefore, more awareness campaigns and more affordable HPV vaccination services should be provided in universities.

Keywords: Knowledge, Attitude, Practise, Human Papillomavirus Vaccination, Medical Students, Universiti Putra Malaysia.

PENGETAHUAN, SIKAP DAN AMALAN TERHADAP PELALIAN HUMAN PAPILLOMAVIRUS (HPV) DALAM KALANGAN PELAJAR PERUBATAN DI UNIVERSITI PUTRA MALAYSIA PADA TAHUN 2013

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ABSTRAK

Latar belakang: Di Malaysia, kanser pangkal rahim adalah kanser ketiga paling kerap terjadi dalam kalangan wanita selepas kanser payudara dan kanser kolorektal meskipun pelalian terhadap HPV telah diperkenalkan oleh Kementerian Kesihatan Malaysia.

Objektif: Objektif kajian ini adalah untuk menentukan tahap pengetahuan, sikap dan amalan suntikan pelalian HPV di kalangan pelajar perubatan UPM.

Kaedah: Kajian ini telah dijalankan pada bulan Mac 2013 hingga bulan Ogos 2013. Borang soal selidik yang diadaptasi dan telah disahkan telah diisi oleh pelajar-pelajar perubatan UPM (n=389).

Keputusan: Hasil kajian menunjukkan bahawa majoriti pelajar mempunyai pengetahuan yang baik dan menunjukkan sikap yang baik terhadap pelalian HPV. Walau bagaimanapun, kebanyakan pelajar menunjukkan tahap amalan pelalian yang rendah (n=196). Hanya sebilangan kecil pelajar telah menerima pelalian HPV (37.8%) dan kebanyakan daripada mereka ini menunjukkan tahap amalan yang baik terhadap pelalian HPV. Dalam kalangan pelajar-pelajar yang tidak menerima pelalian pula (62.2%), sebahagian daripada mereka menyatakan bahawa mereka sendiri masih tidak pasti sama ada mereka akan mendapatkan pelalian HPV tersebut pada masa akan datang. Tiada perbezaan yang signifikan antara pelajar lelaki dan perempuan, dari segi perbandingan antara jantina dan gred sikap terhadap pelalian HPV. Di samping itu, terdapat perhubungan yang signifikan di antara pangkat min skor sikap dan tahun pengajian pelajar.

Konklusi: Secara keseluruhannya, dapat disimpulkan bahawa pelajar-pelajar perubatan di UPM menunjukkan tahap pengetahuan serta sikap yang baik terhadap pelalian HPV. Walau bagaimanapun, sebahagian besar pelajar masih belum menerima pelalian HPV tersebut dan kebanyakan daripada mereka masih tidak pasti sama ada akan mendapatkan pelalian HPV tersebut pada masa hadapan. Oleh itu, kempen kesedaran dan perkhidmatan pelalian HPV yang lebih mampu dinikmati perlu dipergiatkan di universiti-universiti.

Kata kunci: *Pengetahuan, Sikap, Amalan, Pelalian Human Papillomavirus, Pelajar Perubatan, Universiti Putra Malaysia*

TABLE OF CONTENTS

	Pages
APPROVAL SHEET	ii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
ABSTRAK	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
 CHAPTER 1: INTRODUCTION	
1.1 Background	1
1.2 Problem Statement	2
1.3 Objectives	3
1.3.1 General Objectives	3
1.3.2 Specific Objectives	3
1.4 Research Hypothesis	3
 CHAPTER 2: LITERATURE REVIEW	
2.1 About Human Papillomavirus (HPV)	4
2.1.1 Disease Agent	4
2.1.2 Low Risk Infection	4
2.1.3 High Risk Infection	4
2.2 HPV Vaccine	5
2.3 Safety and Side Effects of HPV Vaccine	6
2.4 Factors Affecting HPV Vaccine Acceptance	6
2.5 Barriers to HPV Vaccination	7
2.6 HPV Vaccination Program in Malaysia	8
2.7 Conceptual Framework	9
 CHAPTER 3: METHODOLOGY	
3.1 Study Location	10
3.2 Study Design	10
3.3 Study Duration	10
3.4 Sampling	10
3.4.1 Study Population	10
3.4.2 Sampling Population	10

3.4.2.1 Inclusion Criteria	10
3.4.2.2 Exclusion Criteria	10
3.4.3 Sampling Frame	11
3.4.4 Sampling Unit	11
3.4.5 Sampling Method	11
3.4.6 Sampling Size	12
3.5 Parameters and Variables	13
3.5.1 Dependent Variable	13
3.5.2 Independent Variables	13
3.6 Instrument and Data Collection	13
3.6.1 Instruments/ Questionnaires	14
3.6.2 Questionnaires Development	15
3.6.3 Data Collection Technique	15
3.7 Data Analysis	16
3.8 Study Ethics	16
3.9 Definition of Terms	16
3.10 Flow Chart	18

CHAPTER 4: RESULTS

4.1 Response Rate	19
4.2 Socio-demographic Characteristics of Respondents	19
4.3 Distribution of Grade of Knowledge among Respondents	21
4.4 Distribution of Grade of Attitude among Respondents	24
4.5 Source of HPV Vaccination Information	27
4.6 Preference of HPV Vaccination Information Source	28
4.7 Target Age Group and Gender for Administration of HPV Vaccination as Suggested by Respondents	29
4.8 Practice of HPV Vaccination among Respondents	30
4.9 Experience of Being Offered HPV Vaccination among Gender	33
4.10 Status of Vaccination and Grade of Practice	33
4.11 Acceptance of HPV Vaccination Practice among Unvaccinated Group	34
4.12 Reasons for Not Being Vaccinated	34
4.13 Comparison of Gender and Attitude Grades	35
4.14 Comparison of Year of Study with Attitude Scores	35
4.15 Correlation between Knowledge Scores and Attitude Scores toward HPV Vaccination	36
4.16 Correlation between Knowledge Scores and Practice Scores of HPV Vaccination	37
4.17 Correlation between Attitude Scores and Practice Scores of HPV Vaccination	38

CHAPTER 5: DISCUSSION

5.1 Socio-demographic Characteristics of Respondents	39
5.2 Knowledge of HPV Vaccination among Respondents	40
5.3 Attitude towards HPV Vaccination among Respondents	41
5.4 Awareness and Source of Information on HPV Vaccination	41
5.5 Practise of HPV Vaccination among Respondents	42
5.6 Correlation between Knowledge, Attitude and Practice of HPV Vaccination among Respondents	45

5.7	Strength of Study	45
5.8	Limitation	46
5.8.1	Bias	46
5.8.2	Confounding Factors	46
5.9	Conclusion	47
5.10	Recommendation	48
REFERENCES		50
APPENDIX 1: LETTERS OF APPROVAL FROM JKEUPM		54
APPENDIX 2: LETTERS OF APPROVAL FROM FPSK		57
APPENDIX 3: RESPONDENT’S INFORMATION SHEET		59
APPENDIX 4: CONSENT FORM		60
APPENDIX 5: QUESTIONNAIRE		61
APPENDIX 6: GANTT CHART		68
APPENDIX 7: RESEARCH TEAM		69
APPENDIX 8: RESEARCH BUDGET		69

LIST OF TABLES

	Pages
Table 1	20
Table 2	22
Table 3	25
Table 4	27
Table 5	28
Table 6	29
Table 7	31
Table 8	33
Table 9	33
Table 10	34
Table 11	34
Table 12	35
Table 13	35
Table 14	36
Table 15	37
Table 16	38
Table 17	68
Table 18	69

LIST OF FIGURES

	Pages
Figure 1 Conceptual framework on knowledge, attitude and practise of HPV vaccination	9
Figure 2 Flow chart of research	18
Figure 3 Correlation between Knowledge Scores and Attitude Scores towards HPV vaccination	36
Figure 4 Correlation between Knowledge Scores and Practice Scores of HPV Vaccination	37
Figure 5 Correlation between Attitude Scores and Practice Scores of HPV Vaccination	38
Figure 6 Research Team	69



LIST OF ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
CIN	Cervical Intraepithelial Neoplasia
DNA	Deoxyribonucleic acid
FDA	Food Drug Administration
FMHS	Faculty of Medicine and Health Science
HPV	Human Papillomavirus
JPA	Jabatan Perkhidmatan Awam
LPPKN	Lembaga Penduduk dan Pembangunan Keluarga Negara
NGO	Non-governmental Organization
SD	Standard Deviation
STD	Sexually Transmitted Disease
UPM	Universiti Putra Malaysia

CHAPTER 1: INTRODUCTION

1.1 Background

HPV infection is the most common infection among young and sexually active adults (Weaver, 2006). In Malaysia, cancer of the cervix was the third most common cancer among women, after breast cancer and colorectal cancer. The death rate due to cervical cancer from 1996 to 2000 ranged from 0.29% to 0.41%. Chinese women had the highest incidence for cervical cancer followed by Indians and Malays (Zainal Ariffin Omar, Zainudin Mohd Ali *et al.*, 2006). Mortality from cervical cancer can be reduced by preventive measures, early diagnosis with Pap smear screening as well as treatment before the pre-cancerous lesion progresses to cancer.

Vaccinations are one of the most successful public approaches to control and prevent communicable disease. Two vaccines to prevent Human Papillomavirus have recently been licensed in many countries including Malaysia to provide protection against cervical cancers and its precursors. HPV vaccination would be directed towards preadolescents and young adolescents in an effort to provide the greatest public health benefit offered by a prophylactic HPV vaccine.

HPV is more common among women but it was also found that 51.1% of men tend to carry multiple strands of HPV (Redhwan Ahmed Al-Naggar, 2012). The majority of HPV infections in males and females are asymptomatic therefore most infected individuals are unaware of their infection status (J Bryer, 2011).

We target medical students (age group: 19-25) as in a few years' time, these students will be practicing clinicians, and will be sought by the population as the first line informants regarding HPV vaccination. Thus they would play a pivotal role in spreading awareness amongst the population. The aim of this study is to assess the knowledge and awareness of HPV infection, cervical cancer and HPV vaccination among the medical students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia and furthermore to assess their attitude and practice towards HPV vaccination. It is hoped that our study findings may yield valuable information for the relevant authorities to help them improve and effectively conduct education and awareness programmes on HPV vaccination as a cervical cancer preventive measure.

1.2 Problem Statement

Cervical cancer which is caused by Human Papillomavirus (HPV) is common in Malaysia, which also showed an increasing trend globally. Vaccination towards HPV is provided in Malaysia as a primary prevention for cervical cancer and HPV infection. However, despite numbers of HPV vaccination awareness campaigns had been held in school and community, the acceptance of HPV vaccination was quite unsatisfactory. The major barrier was due to discrimination of HPV vaccination as prevention from the public as HPV infection related to Sexual Transmitted Disease (STD). Most of the women in Malaysia think that they do not need to HPV vaccination as they are not sexually active. Besides, low knowledge level and negative attitude towards HPV vaccination contributes to low awareness of HPV vaccination, which can protect them from cervical cancer. Misconception among the male population that HPV vaccination is only available to women should be corrected. The awareness should be raised in male and female population by proper education and more understanding of the benefits of HPV vaccination against cervical cancer. In this study we aim to assess the

knowledge, attitude and practice of medical students towards HPV vaccination and its related factors.

1.3 Objectives

1.3.1 General Objective

- To study the level of knowledge, attitude and practice of HPV vaccination among medical students from Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

1.3.2 Specific Objectives

- To determine the social demographic characteristics of the respondents.
- To determine the knowledge of HPV vaccination among medical students of Universiti Putra Malaysia.
- To study the attitude towards HPV vaccination among medical students of Universiti Putra Malaysia.
- To evaluate the practice of HPV vaccination among medical students of Universiti Putra Malaysia.
- To determine the association of gender and year of study towards attitude score among medical students of Universiti Putra Malaysia.
- To assess the correlation between knowledge, attitude, and practice among medical students of Universiti Putra Malaysia.

1.4 Research Hypothesis

Medical students in Faculty of Medicine and Health Science, Universiti Putra Malaysia have good knowledge, attitude and practice towards Human Papillomavirus (HPV) vaccination.

CHAPTER 2: LITERATURE REVIEW

2.1 About Human Papillomavirus (HPV)

2.1.1 Disease Agent

Human Papillomavirus (HPV) are associated with a number of clinical condition, which includes genital warts and of the most serious, cervical carcinoma (Lindel, Beer, Laissue, Greiner, Aebersold, 2001). The family of human papilloma viruses consists of over 100 different double-stranded DNA viruses. Among the viruses, approximately 40 types of them can infect the genital tract.

2.1.2 Low Risk Infection

There are more than 100 types of HPV, some types of HPV can cause warts (such as genital or plantar warts) and others can cause cancer (such as cervical or anal cancer) (Medic Resource Inc., 2013). Besides that, HPV infection is also one of the most common Sexually Transmitted Disease in the world. Low risk HPV types 6 and 11 are the cause of majority of anogenital warts, warts are found on or around the genital organs (Al-Naggar, 2012). Most of the genital warts are benign and they usually regress spontaneously.

2.1.3 High Risk Infection

Cervical cancer is the third most common leading cancer in women in Malaysia and the fourth common cause of death in women in Malaysia (Ferlay, Bray, Pisani, Parkin, 2002). Generally, the prevalence of cervical cancer is high among the women in Southeast Asia (Domingo, Noviani, Mohd Rush, Md Noor, Ngelangel, 2008).

Infection with HPV 16 is the cause of 50% or more of cervical cancers in women (Stanley, Pett, Coleman, 2007). The 6 next most common types, namely HPV31, 33, 35, 45, 52 and 58 accounted for an additional 18% of cases. These strains of HPV can cause invasive cervical cancer which was defined as high-grade squamous intraepithelial lesion (HSIL) or CIN3 and above (Wan Puteh, Samsuddin, Shamsul Azhar Shah, Aljunid, 2011).

Cervical cancer develops in some women with persistent pre-malignant cervical intraepithelial neoplasia (CIN), and it usually appears more than a decade after the initial infection. This may be attributed partly to a need for cofactors that promote carcinogenesis, such as smoking (World Health Organization, 2001).

2.2 HPV Vaccine

HPV vaccination helps in prevention of diseases such as cervical cancer and genital warts which is caused by the virus (Centers for Disease Control and Prevention, 2013).

Both the available vaccines offer protection against 2 types of HPV; the HPV-16 and HPV-18 (De Vuys, Clifford, Nascimento, Madeleine, Franceschi, 2009). Both vaccines are available for female however only one of them is available for males (Centers for Disease Control and Prevention, 2013). The vaccine protects the individual from certain strains of HPV only.

Nowadays, the two HPV vaccines are widely used in over 100 countries. The vaccines are important preventive measures against HPV related disease. However, they are not curative. Therefore, the vaccines are most useful when given prior to infection and not after infection.

2.3 The Safety and Side Effects of HPV Vaccine

Food and Drug Administration (FDA) is responsible to assess and determine the safety and the effectiveness of the vaccines. There are no serious side effects due to the vaccine so far. The commonest problems are mild soreness and other local symptoms at the injection site (Cutts, Franceschi, Goldie, Castellsague, Sanjose, Garnett, Markowitz, 2007).

The most common events reported are syncope, dizziness, nausea, headache and local reactions (Slade, Leidel *et al.*, 2009). There are 32 death reports and further investigation showed that the deaths were not due to the vaccines (Slade, Leidel *et al.*, 2009). FDA and CDC have taken a few steps in order to increase the safety of the vaccine. One of them is reminding the vaccine providers about the recommendation that the individuals receiving the vaccine are to be watched carefully for 15 minutes after vaccinated. This step is taken to avoid potential injury following a fall due to syncope (Slade, Leidel *et al.*, 2009).

2.4 Factors Affecting HPV Vaccine Acceptance

There are many factors that may influence an individual's decision to get vaccinated. A study in Korea showed that the level of knowledge regarding HPV and HPV vaccine significantly affected the acceptance of the vaccines (Han, Y. J. *et al.*, 2007). A study conducted by A.F. Dempsey and her colleagues showed that the attitude towards the matter is an important factor.

Another study was conducted among Jewish British mothers with daughters showed high acceptance of the vaccine by the mothers for their daughters because of religious view and they thought that it is better to protect them with the vaccine (Gordon, Waller, Warlow, 2011). Besides that, a person's fear of cancer also appeared to be one of the factors promoting

HPV vaccine acceptance. (Madhivanan, Krupp, Yashodha, 2009). Therefore, a protective measure from cancer such as vaccination is expected to be easily accepted. Recommendation from doctors and other healthcare professionals could help in fostering the acceptance of HPV vaccine.

2.5 Barriers to HPV Vaccination

There are lot of factors which could reduce the acceptance of the vaccine by the community. One of them is lack of availability of the vaccine (Keating, Brewer, Gottlieb, Liddon, Ludema, Smith, 2008). This can be caused by the failure of the healthcare institution to restock or replenish the vaccine after they have been used up or expired (Keating, Brewer, Ludema, Smith, 2008).

A study was conducted by D. Gordon and his colleague in 2010 among mothers to find out the reasons for declining or and accepting the vaccine. Almost all mothers who declined to accept the vaccine for their daughters stated their reason to be because they perceived that the risk of their daughters to be infected was low (Gordon, Waller, Marlow, 2011). Besides that, most of the mothers who refused the vaccination were concerned about the safety of the vaccine.

A study also showed that the mothers thought that vaccinating their daughters might encourage them to have unprotected sexual behaviour (Joseph, Bauchner, Walsh, Figaro, Perkins, 2012). Therefore the mothers refused to agree on their daughters' vaccination.

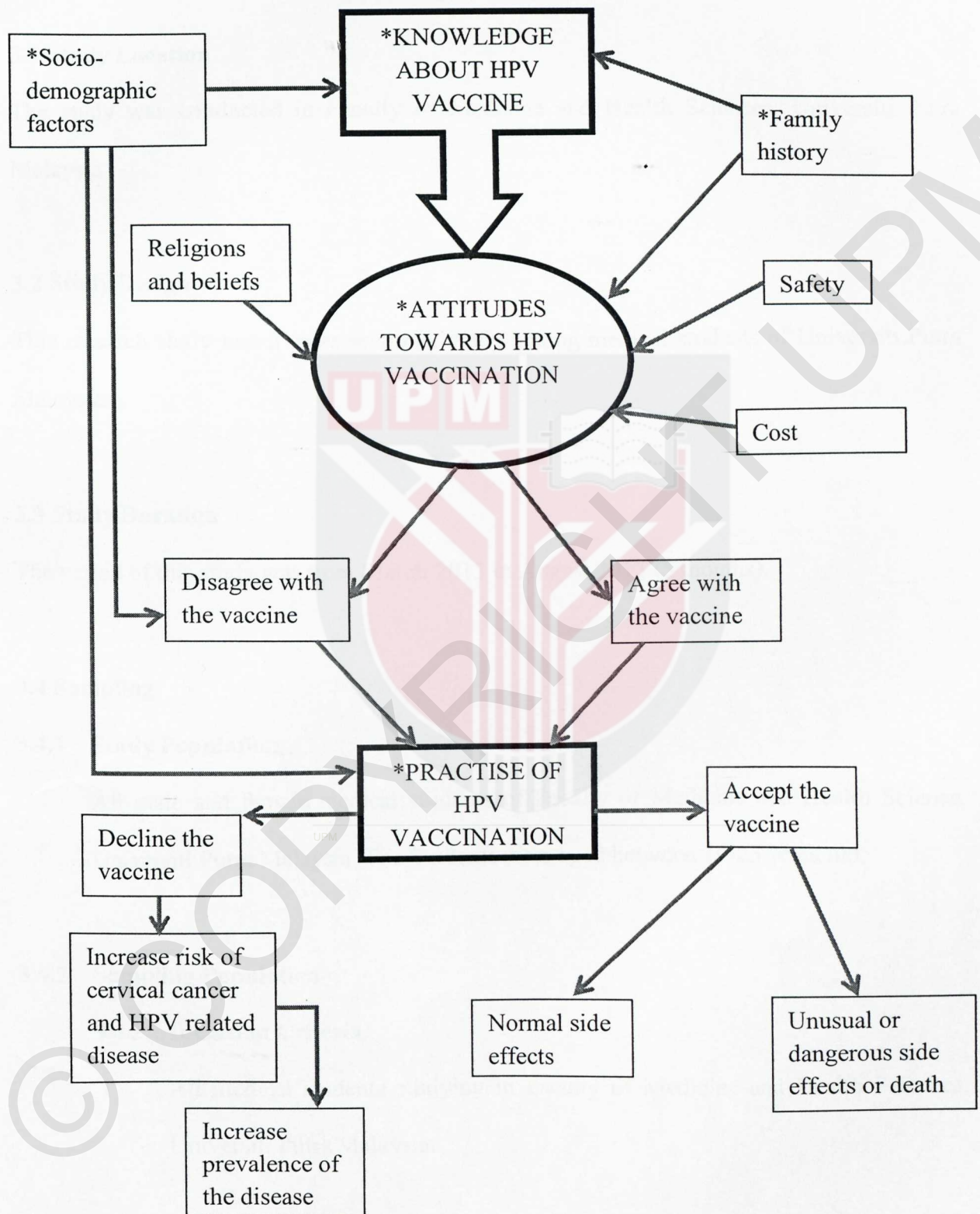
2.6 HPV Vaccination Programme in Malaysia

In year 2012, the 'catch up programme' was introduced to Malaysian females, which was included under the 2012 Budget whereby the government provide free HPV immunization to prevent cervical cancers. The target groups under this programme were 18 year old female students, and through this catch up programme, it enabled students to receive information regarding HPV from their institutions. The programme also involved disseminating information to the public as well as private higher institutions regarding the implementation of HPV Vaccination Programme (LPPKN, 2012).

The existing vaccination programmes in Malaysia are HPV vaccine given at 0, 1 and 6 months schedule, target to complete 3 doses programme within school calendar year. The School Health Unit (Public Health, MOH) is responsible to vaccinate their Form One students.

According to Ministry of Health Malaysia, parents will receive consent form along to with leaflets explaining the importance of HPV immunization to their children while the children who received HPV vaccination will get an immunization card during their first dose of immunization, to remind them of the appointment date for next dose of immunization (LPPKN, 2012).

2.7 Conceptual Framework



**Parameters being studied.*

Figure 1: Conceptual framework on knowledge, attitude and practise of HPV vaccination.

CHAPTER 3: METHODOLOGY

3.1 Study Location

The study was conducted in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

3.2 Study Design

This research study was a cross-sectional study among medical students of Universiti Putra Malaysia.

3.3 Study Duration

The period of this study was from March 2013 to August 2013 (5 months).

3.4 Sampling

3.4.1 Study Population

All male and female medical students of Faculty of Medicine and Health Science, Universiti Putra Malaysia. The Students were aged between 19-25 years old.

3.4.2 Sampling Population

3.4.2.1 Inclusion Criteria

All medical students studying in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

3.4.2.1 Exclusion Criteria

No exclusion criteria.

3.4.3 Sampling Frame

Respondents who fulfilled the inclusion criteria. The list of medical students was obtained from the Dean's office in Faculty of Medicine and Health Sciences.

3.4.4 Sampling Unit

Medical students aged 19-25 years old who fulfilled the inclusion criteria.

3.4.5 Sampling Method

The sampling method used was stratified random sampling. We stratified the sample size required based on year of study. Total number of medical students in Universiti Putra Malaysia is 506 students.

$$\text{Year 1} = 139/506 \times 457 = 126 \text{ students}$$

$$\text{Year 2} = 129/506 \times 457 = 116 \text{ students}$$

$$\text{Year 4} = 116/506 \times 457 = 105 \text{ students}$$

$$\text{Year 5} = 122/506 \times 457 = 110 \text{ students}$$

3.4.6 Sampling Size

The sample size was calculated by using formula:

$$n = \frac{\left\{ Z\left(1 - \frac{\alpha}{2}\right) \sqrt{2\bar{P}(1-\bar{P})} + Z(1-\beta) \sqrt{P1(1-P1) + P2(1-P2)} \right\}^2}{(P1-P2)^2}$$

Where,

n = sample size

$$\bar{P} = \frac{P1 + P2}{2}$$

$P1$ = estimated proportion for group 1

$P2$ = estimated proportion for group 2

$$Z\left(1 - \frac{\alpha}{2}\right) = 95\% \text{ CI} = 1.96$$

$$Z(1 - \beta) = 0.842$$

Comparison between males and females:

$$n = \frac{\left\{ 1.96 \sqrt{2(0.744)(0.256)} + 0.842 \sqrt{(0.657)(0.343) + (0.831)(0.169)} \right\}^2}{(-0.174)^2}$$

$$n = 98$$

Comparison between educational levels (i.e. pre-clinical and clinical years):

$$n = \frac{\left\{ 1.96 \sqrt{2(0.7595)(0.2405)} + 0.842 \sqrt{(0.718)(0.282) + (0.801)(0.199)} \right\}^2}{(-0.083)^2}$$

$$n = 415$$

We take the larger value of the sample size which is the 415. We expected 10% non-response bias. Hence, 10% respondent of sample size will be added.

$$n = 415 + (0.1)(415)$$

$$n = 457$$

3.5 Parameters and Variables

3.5.1 Dependent Variable:

The dependent variable for this study is the level of knowledge, attitude and practice regarding HPV vaccination of the medical students in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

3.5.2 Independent Variables:

1. Age
2. Gender
3. Year of study
4. Presence of exposure to HPV Vaccination
5. Background or demographic data

3.6 Study Instrument and Data Collection

Questionnaires were used in this study to investigate the knowledge, attitude and practice towards HPV vaccination among all respondents.

3.6.1 Questionnaire

The study was conducted using a validated questionnaire. The questionnaire used in this study was adopted from previous studies done by The Dana-Farber Cancer Institute (DFCI) and Knowledge Network HPV vaccine study. The questionnaire was validated by researchers and our supervisor, Doctor Anizah Ali from Obstetrics and Gynaecology Department of UPM before applied. The questionnaires were pre-tested by 45 medical students from Perdana University Malaysia.

3.6.2 Questionnaire development

The questionnaire consisted of 4 parts; socio-demographic characteristics, knowledge about HPV, attitude and practice of HPV vaccine. The questionnaires were in English language.

Part A: Socio-demographic data

This part of the questionnaire contained socio-demographic data which include age, gender, ethnicity, year of education, marital status, hometown, and family history of cervical cancer. No scoring method was involved in this part.

Part B: Knowledge of Human Papillomavirus vaccination

This part of the questionnaire emphasized on the knowledge of HPV infection and vaccination among medical students in UPM. Total marks for this part is 16 marks. Respondents with marks ranging from 11 to 16 will be categorise as having good knowledge, 6 to 10 marks as moderate knowledge, and 0-5 marks as poor knowledge on HPV vaccination.

Part C: Attitude Of Human Papillomavirus vaccination

This part covered the attitude towards HPV vaccination. It emphasised on the acceptance of HPV vaccination, opinion of medical students towards safety and effectiveness of HPV vaccination as a primary prevention for cervical cancer. This section has an overall mark of 50. Respondents with 35 to 50 marks will be categorised as having good attitude, 18 to 34 marks as moderate attitude, and 0 to 17 marks as poor attitude towards HPV vaccination.

Part D: Practise of Human Papillomavirus vaccination

This session evaluated the status of HPV vaccination, factors affecting acceptance of HPV vaccination and their willingness to promote the vaccination to their patients as well as to vaccinate themselves in the future; among medical students. Total marks in this part are 36. Unlike other parts, practise of HPV vaccination was divided into 2 only which were good and poor practise. Respondents with marks 31 to 36 was categorised as having good practise, and marks 0 to 30 as poor practise of HPV vaccination.

3.6.3 Data Collection Technique

Written consent were obtained from the participants and all potential participants were invited to participate through a letter, containing the purpose and the objectives of the study. Besides that, the letter also indicates that participation in the survey is voluntary, and their privacy and confidentiality would be strictly protected. Participants were given a questionnaire and explanation was provided to assist them in completing the questionnaire. The questionnaires were collected 2 hours after the distribution. Follow up was conducted twice to reduce non-response bias.

3.7 Data Analysis

Data was analyzed by using IBM SPSS statistics version 21.0. Descriptive statistics including frequencies and percentages were calculated for each item in the questionnaire. Descriptive analysis was used for subjects' socio-demographic data. Chi-square test was used to find association between categorical data. Parametric test was used for normal distribution data while non-parametric test was used for non-normally distributed data.

3.8 Study Ethics

A written approval and permission was obtained from the Medical Research Ethics Community of Faculty of Medicine and Health Sciences (FMHS), Universiti Putra Malaysia. Apart from that, we also obtained the approval of Dean of FMHS in order to conduct this study. Information sheets regarding the study were distributed during the study.

3.9 Definition of Terms

a) Human Papillomavirus (HPV)

Human Papillomavirus is a double-stranded DNA virus of the family Papovaviridae. It causes an infectious disease. It is a DNA virus that causes warts on sacral parts.

b) Vaccine

A preparation of a weakened or killed pathogen, such as a bacterium or virus, or of a portion of the pathogen's structure that upon administration stimulates antibody production or cellular immunity against the pathogen but is incapable of causing severe infection.

c) Knowledge

It is a fact, information, and skill acquired through experience or education; the theoretical or practical understanding of a subject.

d) Attitude

Attitude is defined as a settled way of thinking or feeling about something.

e) Practise

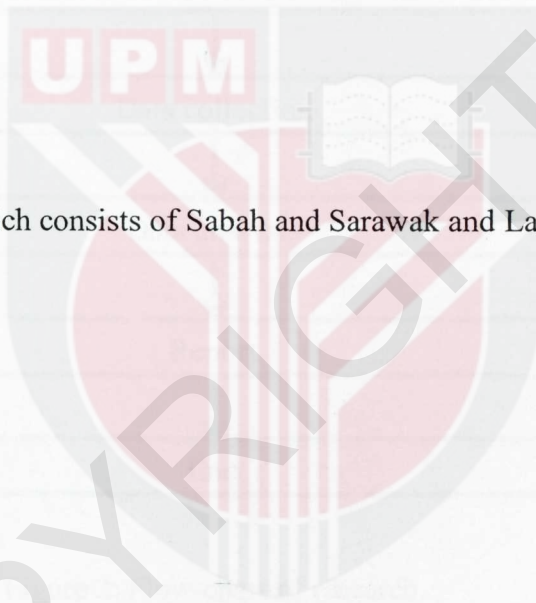
It is defined as the actual application or use of an idea, belief, or method, as opposed to theories relating to it. It can be also the customary, habitual, or expected procedure or way of doing of something.

f) East Coast Malaysia

States in East Coast of Peninsular Malaysia which consists of Kelantan, Pahang and Terengganu.

g) East Malaysia

States in East Malaysia which consists of Sabah and Sarawak and Labuan.



3.10 Flow Chart

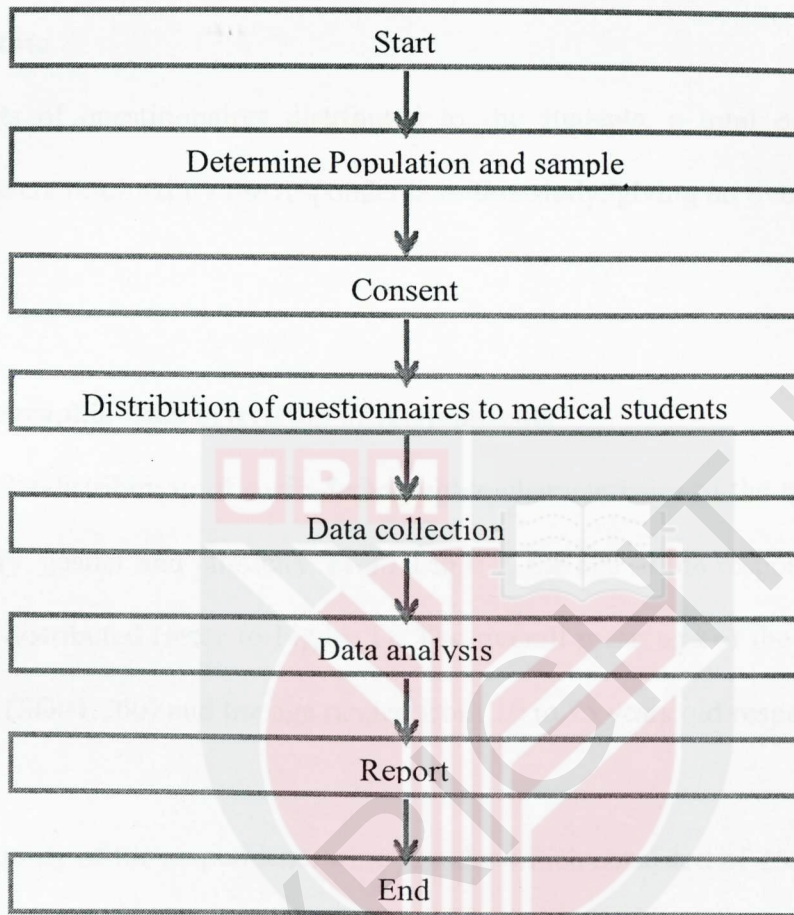


Figure 2: Flow chart of research.

CHAPTER 4: RESULTS

4.1 Response Rate

Out of 457 sets of questionnaires distributed to the students, a total of 389 completed questionnaires were returned by the respondents in this study, giving an overall response rate of 85%.

4.2 Socio-demographic Characteristics of Respondents

Table 1 shows the distribution of socio-demographic characteristics of the respondents based on Year of study, gender and ethnicity. From Table 1, the age of the respondents was found to be normally distributed (refer to Figure 1). The overall mean age of the respondents was 21.45 years old (SD=1.260) and the age ranged from 19 to 25 years old respectively.

Overall, the majority of the respondents were female, which consisted of 255 female students (65.6%). Out of 389 respondents, the majority were Malays (53.2%), followed by Chinese (38.6%), Indians (5.9%) and other ethnicities i.e. Sikh (2.3%).

Among the medical students studying in Universiti Putra Malaysia, there were 27.8% respondents from Year 1 (n=108), 25.7% (n=100) respondents from Year 2, 20.8% (n=81) from Year 4, and 25.7% (n=100) from Year 5. All of the medical students recruited into this study were not married (100%).

Majority of the respondents came from North Malaysia (34.2%), followed by Central Malaysia (32.1%). Enquiring on family history of cervical cancer among the respondents, only 8 (2.1%) respondents had positive history of cervical cancer in the family. This showed that the prevalence of positive family history of cervical cancer was low among the medical students in Universiti Putra Malaysia.

Table 1: Socio-demographic Characteristics of Respondents

Factors	Frequency (n)	Percentages (%)
Gender		
Male	134	34.4
Female	255	65.6
Ethnicity		
Malays	207	53.2
Chinese	150	38.6
Indians	23	5.9
Others	9	2.3
Year of Study		
Year 1	108	27.8
Year 2	100	25.7
Year 4	81	20.8
Year 5	100	25.7
Marital Status		
Married	0	0.0
Single	389	100.0
Hometown		
North Malaysia	133	34.2
East Coast Malaysia	52	13.4
Central Malaysia	125	32.1
South Malaysia	50	12.9
East Malaysia	29	7.5
Any Family History of Cervical Cancer		
Yes	8	2.1
No	381	97.9

4.3 Distribution of Grade of Knowledge among Respondents

Good knowledge was the highest among female respondents (70.6%) while poor knowledge was equal between both genders, which was 50% for male and 50% for female.

Even though overall Malay made up the majority of those with good knowledge (47.2%), when considering the Malay ethnicity per se, majority of them have moderate knowledge (73.9%). On the contrary, the Chinese ethnicity, majority of them scored good knowledge (45.2%).

5th Year medical students demonstrated good knowledge (30.1%) among all the years of study.

Unlike attitude grades, respondents from North Malaysia scored the highest for good knowledge (38.1%)

Positive family history of cervical cancer did not predict good knowledge on HPV vaccination amongst the respondents.

Table 2: Distribution of Grade of Knowledge among Respondents

Group	Good Knowledge n (%) (n=299)	Moderate Knowledge n (%) (n=88)	Poor Knowledge n (%) (n=2)
Gender			
Male	88 (29.4)	45 (51.1)	1 (50.0)
Female	211 (70.6)	43 (48.9)	1 (50.0)
Ethnicity			
Malay	141 (47.2)	65 (73.9)	1 (50.0)
Chinese	135 (45.2)	14 (15.9)	1 (50.0)
Indian	18 (6.0)	5 (5.7)	0 (0.0)
Others	5 (1.7)	4 (4.5)	0 (0.0)
Marital Status			
Single	299 (100.0)	88 (100.0)	2 (100.0)
Married	0 (0.0)	0 (0.0)	0 (0.0)
Year of Study			
1 st Year	70 (23.4)	37 (42.0)	1 (50.0)
2 nd Year	70 (23.4)	29 (33.0)	1 (50.0)
4 th Year	69 (23.1)	12 (13.6)	0 (0.0)
5 th Year	90 (30.1)	10 (11.4)	0 (0.0)

Table 2 (cont.): Distribution of Grade of Knowledge among Respondents

Group	Good Knowledge n (%) (n=299)	Moderate Knowledge n (%) (n=88)	Poor Knowledge n (%) (n=2)
Hometown			
North Malaysia	114 (38.1)	19 (21.6)	0 (0.0)
East Coast Malaysia	35 (11.7)	17 (19.3)	0 (0.0)
Central Malaysia	91 (30.4)	33 (37.5)	1 (50.0)
South Malaysia	39 (13.0)	11 (12.5)	0 (0.0)
East Malaysia	20 (6.7)	8 (9.1)	1 (50.0)
Family History of Cervical Cancer			
Yes	4 (1.3)	4 (4.5)	0 (0.0)
No	295 (98.7)	84 (95.5)	2 (100.0)

4.4 Distribution of Grade of Attitude among Respondents

From table 3, it show that there were 207 respondents who scored good attitude (53.2%), 179 respondents with moderate attitude (46%) and 3 respondents with poor attitude (0.8%). Overall, the female respondents scored good attitude (69.1%) compared to the male (30.9%). Out of the 3 respondents who scored poorly in attitude assessment, 2 (66.7%) were female.

In comparing the attitude grade in terms of ethnicity, Malays had the highest number of respondent with good attitude towards HPV vaccination. Surprisingly, 3 Chinese respondents scored poorly in the attitude assessment despite having good knowledge scores.

Overall, respondents with good knowledge had good attitude as well. Respondents with poor knowledge are found to have moderate attitude towards HPV vaccination. However, it was found that among the respondents with good knowledge 41.1% only scored moderate for attitude towards HPV vaccination.

Table 3 also shows that 57.9% of respondents scored well for both aspects of knowledge and attitude, while 41.1% had good knowledge but moderate attitude.

5th Year students had the highest percentage of respondents with good attitude (34.8%). Majority of the respondents with moderate attitude were amongst 1st year students.

Respondents from Central Malaysia excelled in attitude scores while poor attitude scores were mainly from North Malaysia.

Table 3: Distribution of Grade of Attitude among Respondents

Group	Good Attitude n =207 (%)	Moderate Attitude n=179 (%)	Poor Attitude n=3 (%)
Gender			
Male	64 (30.9)	69 (38.5)	1 (33.3)
Female	143 (69.1)	110 (61.5)	2 (66.7)
Ethnicity			
Malay	108 (52.2)	99 (55.3)	0 (0.0)
Chinese	84 (40.6)	63 (35.2)	3 (100.0)
Indian	8 (3.9)	15 (8.4)	0 (0.0)
Others	7 (3.4)	2 (1.1)	0 (0.0)
Year of Study			
1 st year	42 (20.3)	66 (36.9)	0 (0.0)
2 nd year	51 (24.6)	48 (26.8)	1 (33.3)
4 th year	42 (20.3)	38 (21.2)	1 (33.3)
5 th year	72 (34.8)	27 (15.1)	1 (33.3)
Marital Status			
Single	207 (100.0)	179 (100.0)	3 (100.0)
Married	0 (0.0)	0 (0.0)	0 (0.0)

Table 3 (cont.): Distribution of Grade of Attitude among Respondents

Group	Good Attitude n=207 (%)	Moderate Attitude n=179 (%)	Poor Attitude n=3 (%)
Hometown			
North Malaysia	68 (32.9)	62 (34.6)	3 (100.0)
East Coast Malaysia	32 (15.5)	20 (11.2)	0 (0.0)
Central Malaysia	69 (33.3)	56 (31.3)	0 (0.0)
South Malaysia	22 (10.6)	28 (15.6)	0 (0.0)
East Malaysia	16 (7.7)	13 (7.3)	0 (0.0)
Family History of Cervical Cancer			
Yes	3 (1.4)	5 (2.8)	0 (0.0)
No	204 (98.6)	174 (97.2)	3 (100.0)
Knowledge Grade			
Good Knowledge	173 (57.9) (83.6)	123 (41.1) (68.7)	3 (1.0) (100.0)
Moderate Knowledge	34 (38.6) (16.4)	54 (61.4) (30.2)	0 (0.0) (0.0)
Poor Knowledge	0 (0.0) (0.0)	2 (100.0) (1.1)	0 (0.0) (0.0)

4.5 Source of HPV Vaccination Information

Table 4 shows the source whereby the respondents obtained their first exposure on HPV vaccination information. The main source of HPV vaccination information among the respondents was from school/university. Surprisingly, despite being medical students with easy access to medical practitioners, only 15.4% obtained information on HPV vaccination from healthcare providers.

Table 4: Source of HPV Vaccination Information

Respondents first hear about HPV vaccine from	Frequency (n)	Percentage (%)
My health care provider	98	15.4
A friend	65	10.2
A family member	46	7.2
Television or radio	112	17.6
Internet	66	10.4
Newspaper or magazine	95	15.5
At school/university	125	19.7
I do not remember	28	4.4

4.6 Preference of HPV Vaccination Information Source

Majority of the respondents chose to obtain information regarding HPV vaccination from their lecturers as well as healthcare providers. The least preferred sources of information regarding HPV vaccination were from family members and friends.

Table 5: Preference of HPV Vaccination Information Source

Respondents prefer to receive information about HPV vaccine from	Frequency (n)	Percentage (%)
Health care provider	251	38.1
A friend	38	5.8
A family member	39	5.9
From lecturers	105	15.9
Television or radio	72	10.9
Internet	89	13.5
Newspaper or magazine	65	9.9

4.7 Target Age Group and Gender for Administration of HPV Vaccination as Suggested by Respondents

From table 6, it shows that majority of the male respondents chose to administer HPV vaccine for those aged 17-18 years old (32.8%) whereas majority of the female respondents (38.0%) chose to administer HPV vaccine at a younger age which is 13-14 years old.

Besides that, 41.8% of the male respondents opted to administer HPV vaccine exclusively to girls. In contrast, majority of the female respondents (38.4%) opted to administer the HPV vaccine universally to both boys and girls. Unfortunately, 3 female respondents were against the HPV vaccination by saying that no one should receive the vaccine.

Table 6: Target Age Group and Gender for Administration of HPV Vaccination as Suggested by Respondents

Group	Male Respondents n=134 (%)	Female Respondents n=255 (%)
Suggested Age Group for HPV Vaccination		
Earlier than 9	7 (5.2)	2 (0.8)
9-10	8 (6.0)	19 (7.5)
11-12	14 (10.4)	36 (14.1)
13-14	35 (26.1)	97 (38.0)
15-16	12 (9.0)	40 (15.7)
17-18	44 (32.8)	32 (12.5)
19 or older	14 (10.4)	27 (10.6)
Never	0 (0.0)	2 (0.8)
Suggested Gender Group for HPV Vaccination		
All girls	56 (41.8)	91 (35.7)
All boys	0 (0.0)	2 (0.8)
All boys and girls	45 (33.6)	98 (38.4)
Anyone who is sexually active	31 (23.1)	61 (23.9)
No one	0 (0.0)	3 (1.2)

4.8 Practice of HPV Vaccination among Respondents

Table 7 shows the practice of HPV vaccination among medical students. Majority female showed good practice (76.7%) in terms of administering HPV vaccine. Surprisingly, the female respondents also made up the majority of poor practice (54.6%) with regards to HPV vaccine administration.

Under the group of poor practice of HPV vaccination, 71.9% of the respondents scored well in terms of knowledge. Majority were of Malay ethnicity (49.5%). To our dismay, 31.1% of this poor of them were in their 2nd Year of study and they hailed from North Malaysia.

Surprisingly, we found that medical students in their 1st Year (29.0%) gain the highest percentage of good practice towards HPV vaccination in comparison to their seniors in the 5th year (26.4%).

Those with positive family history of cervical cancer scored moderate to good in terms of practice compared to those without.

Majority of those with good knowledge translates into good practice (52.8%). Good attitude translate into good practice (58.9%) and as expected poor attitude predicts poor practice.

Table 7: Practice of HPV Vaccination among Respondents

Group	Good Practice n =193 (%)	Poor Practice n=196 (%)
Gender		
Male	45 (23.3)	89 (45.4)
Female	148 (76.7)	107 (54.6)
Ethnicity		
Malay	110 (57.0)	97 (49.5)
Chinese	67 (34.7)	83 (42.3)
Indian	11 (5.7)	12 (6.1)
Others	5 (2.6)	4 (2.0)
Year of Study		
1 st year	56 (29.0)	52 (26.5)
2 nd year	39 (20.2)	61 (31.1)
4 th year	47 (24.4)	34 (17.3)
5 th year	51 (26.4)	49 (25.0)
Hometown		
North Malaysia	65 (33.7)	68 (34.7)
East Coast Malaysia	27 (14.0)	25 (12.8)
Central Malaysia	66 (34.2)	59 (30.1)
South Malaysia	21 (10.9)	29 (14.8)
East Malaysia	14 (7.3)	15 (7.7)

Table 7 (cont.): Practice of HPV Vaccination among Respondents

Group	Good Practice n =193 (%)	Poor Practice n=196 (%)
Family History of Cervical Cancer		
Yes	1 (0.5)	7 (3.6)
No	192 (99.5)	189 (96.4)
Knowledge Grade		
Good Knowledge	158 (52.8) (81.9)	141 (47.2) (71.9)
Moderate Knowledge	35 (39.8) (18.1)	53 (60.2) (27.0)
Poor Knowledge	0(0.0) (0.0)	2 (100.0) (1.0)
Attitude Grade		
Good Attitude	122(58.9) (63.2)	85 (41.1) (43.4)
Moderate Attitude	71 (39.7) (36.8)	108 (60.3) (55.1)
Poor Attitude	0 (0.0) (0.0)	3 (100.0) (1.5)

4.9 Experience of Being Offered HPV Vaccination among Gender

From Table 8, majority of the HPV vaccination were offered to females rather than males.

Table 8: Experience of Being Offered HPV Vaccination among Gender

Gender	Have you ever been offered the HPV vaccine by your health care provider?			Total n
	Yes	No	I do not know	
Male	16	111	7	134
Female	167	82	6	255
Total	183	193	13	389

4.10 Status of Vaccination and Grade of Practice

Majority of respondents who themselves had been vaccinated showed good practice toward HPV vaccination. However, a minority (32.7%) of respondents showed moderate to poor practice despite being vaccinated. Among those who were not vaccinated, majority showed poor practice towards HPV vaccination with an astounding figure of 61.3%.

Table 9: Status of Vaccination and Grade of Practice

Received HPV vaccination	Practice Grade, n (%)		Total
	Good	Poor	
Yes	99 (67.3) (51.3)	48 (32.7) (24.5)	147
No	94 (38.8) (49.7)	148 (61.3) (75.5)	242
Total	193 (100.0)	196 (100.0)	389

4.11 Acceptance of HPV Vaccination Practice among Unvaccinated Group

From Table 10, majority of the respondents who were not vaccinated were not sure whether they would vaccinate themselves in the future. Collectively, 46.3% of those who were not vaccinated stated likelihood of getting vaccinated in the future. It is a bit disappointing, that 7.4% of the respondents stated that they were very unlikely to get themselves vaccinated.

Table 10: Acceptance of HPV Vaccination Practice among Unvaccinated Group

How likely is it that you will get yourself vaccinated against HPV in future?	Frequency n	Percentage %
Very Likely	50	20.7
Likely	62	25.6
Not Sure	85	35.1
Unlikely	27	11.2
Very Unlikely	18	7.4
Total	242	100

4.12 Reasons for Not Being Vaccinated

Despite the overall moderate to good knowledge among the respondents, 39.1% were not vaccinated as they deemed themselves not at risk of HPV infection and cervical cancer, and majority of this group were male respondents. 1.4% refused to be vaccinated for religious or cultural reasons. Cost of the vaccination ranked as the second hindrance towards vaccination (34.1%).

Table 11: Reasons for Not Being Vaccinated

Main Reason for Not Receiving HPV Vaccination	Frequency n	Percentage %
Lack of confidence with the Vaccination	20	7.2
Lack of knowledge towards HPV Vaccination	26	9.4
Stigma and embarrassment of receiving a HPV Vaccination	18	6.5
Personal experience	6	2.2
The vaccination is against my religious/ culture belief	4	1.4
The cost for HPV vaccination is expensive to me	94	34.1
I think I'm not in the risk group of getting HPV infection or cervical cancer	108	39.1

4.13 Comparison of Gender and Attitude Grades

Since there were only minimal respondents with poor attitude for this statistical analysis, the moderate and poor attitude were merged. In comparing gender and attitude grades, there was no significant difference ($\chi^2=2.441$, $p\text{-value} = 0.118$, $p>0.05$).

Table 12: Comparison of Gender with Attitude Grades

Gender	Grade of Attitude, n (%)		Total n	Chi-Squared Test	
	Good	Moderate to poor		χ^2	p-value
Male	64 (30.9)	70 (38.5)	134	2.441	0.118
Female	143 (69.1)	112 (61.5)	255		
Total	207 (100)	182 (100)	389		

4.14 Comparison of Year of Study with Attitude Scores

From Table 13, it shows that there were significant association between mean rank for attitude scores and Year of study using the Kruskal-Wallis test ($H(3)=43.253$, $p=0.001$).

Table 13: Comparison of Year of Study with Attitude Scores

Year of Study	Frequency	Score (Mean Rank)	Score (median, interquartile range)	Kruskal-Wallis test
1 st Year	108	153.70	33, 8.5	$H(3)=43.253$, $p=0.001^*$
2 nd Year	100	182.87	35, 5.0	
4 th Year	81	192.49	35, 7.0	
5 th Year	100	253.76	38,6.0	

Kruskal-Wallis test

*Significant at 0.05 level

4.15 Correlation between Knowledge Scores and Attitude Scores towards HPV Vaccination

From Table 14, the result showed that there was a significant weak, direct linear relationship between knowledge scores and total score of attitude towards HPV vaccination ($r_s=0.215$, $p=0.001$). Since the Spearman's was positive, we could conclude that when the knowledge score is high in medical students, the total score of attitude will also be high. An individual with higher knowledge score in HPV vaccination is expected to score higher in attitude score on HPV vaccination compared to those of moderate to poor knowledge level.

Table 14: Correlation between Knowledge Scores and Attitude Scores towards HPV Vaccination

Total Attitude Score towards HPV Vaccination	
	r_s 0.215
	p -value 0.001*
Total Knowledge Score	n= 389

Spearman Correlation
*significant at level 0.05

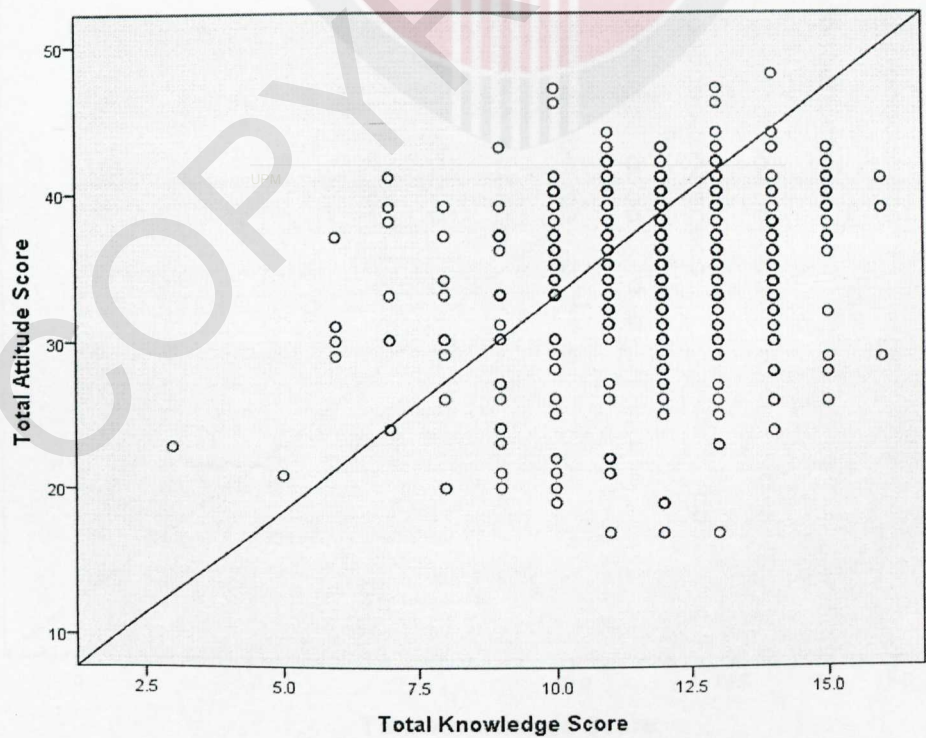


Figure 3: Correlation between Knowledge Scores and Attitude Scores towards HPV vaccination

4.16 Correlation between Knowledge Scores and Practice Scores of HPV Vaccination

The result showed that there was a significant weak, direct linear relationship between knowledge scores and practice scores of HPV vaccination among the respondents ($r_s=0.180$, $p=0.001$). Since the Spearman's was positive, we could conclude that the knowledge grade is directly proportional to the practice scores.

Table 15: Correlation between Knowledge Scores and Practice Scores of HPV Vaccination

Total Practice Score of HPV Vaccination	
	r_s 0.180
	p -value 0.001*
Knowledge Score	n= 389
Spearman's Correlation	
*significant at level 0.05	

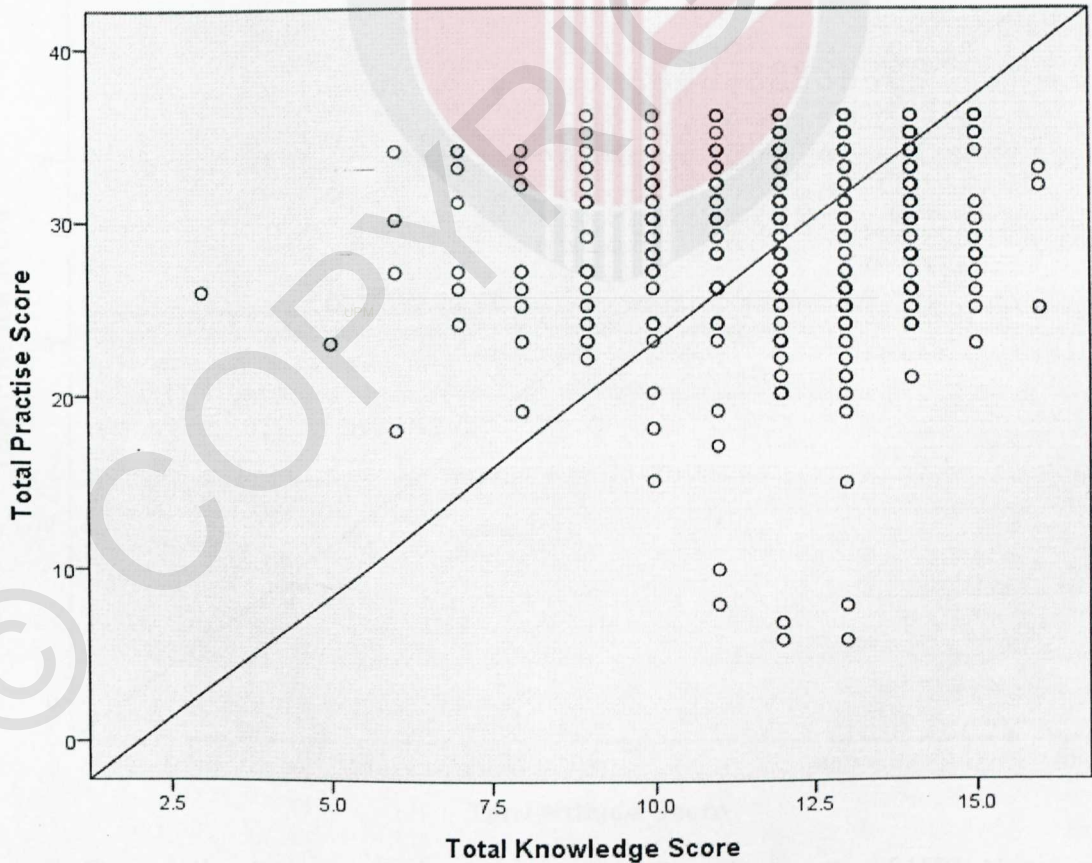


Figure 4: Correlation between Knowledge Scores and Practice Scores of HPV Vaccination

4.17 Correlation between Attitude Scores and Practice Scores of HPV Vaccination

The result showed that there was a significant moderate, direct linear relationship between the attitude score and practice scores of HPV vaccination ($r_s=0.319$, $p=0.001$). Since the Spearman's was positive, we could conclude that when the attitude scores of respondents increases, the practice scores of the respondents also increases.

Table 16: Correlation between Attitude Scores and Practice Scores of HPV Vaccination

		Total Practice Score of HPV Vaccination	
		r_s	p -value
Attitude Score		0.319	0.001*
Spearman's Correlation		n= 389	
*significant at level 0.05			

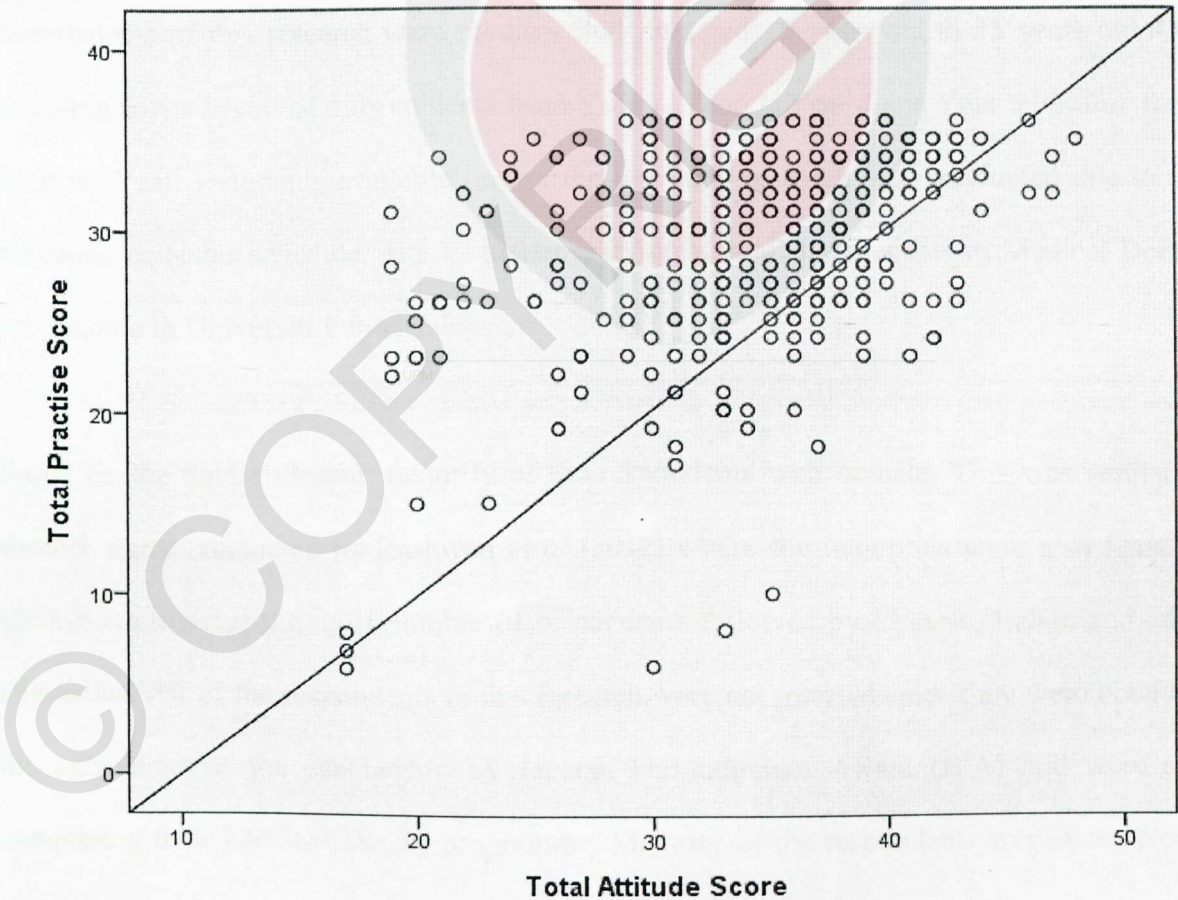


Figure 5: Correlation between Attitude Scores and Practice Scores of HPV Vaccination

CHAPTER 5: DISCUSSION

5.1 Socio-demographic Characteristics of Respondents

This research involved 389 respondents overall. All of them were the medical students of Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. A total of 457 sets of questionnaires were distributed to the respondents and collected back. Unfortunately, only a total of 389 sets of the questionnaires were eligible to be included in the study as these questionnaires were returned completed by the respondents. The residual questionnaires had to be excluded as they were incomplete, most probably due to time constraint or non-committant attitude of the respondents.

Respondents of this research were medical students aged 19 years old to 25 years old. Our sampling frame involved only students from Year 1, Year 2, Year 4 and Year 5 because there were no Year 3 students available during the time this research was conducted due to the academic calendar schedule. The inclusion criterion was all the students in Medical Doctor programme in Universiti Putra Malaysia.

Based on the data collected, majority of the respondents were female. This was similar to another study conducted by Rashwan *et al* (2012) where the majorities were also females. Malays contributed the most number of respondents followed by Chinese, Indian and other ethnicities. All of the respondents in this research were not married since they were bound to the agreement of the scholarship by Jabatan Perkhidmatan Awam (JPA) and were still completing their Medical Doctor programme. Majority of the respondents were from North Malaysia which meant most of them were from either Kedah, Perlis, Perak, or Penang followed by respondents from Central Malaysia which consisted of Kuala Lumpur, Selangor

and Negeri Sembilan. Most of the respondents did not have any family history of cervical cancer.

5.2 Knowledge of HPV Vaccination among Respondents

The level of knowledge and grade of attitude towards HPV vaccination among the medical students in Universiti Putra Malaysia were high, and majority of the medical students had good practice of HPV vaccination. In this study, it showed that medical students had higher knowledge which was attributable to their education syllabus and furthermore they have more exposure towards HPV infection such as cervical cancer cases during their clinical attachments. Similar results were reported in a study conducted by Rashwan *et al* (2012). In this study, most of the female students had more accurate knowledge making up 70.6% among those with good knowledge compared to the male students. This was understandable most probably because cervical cancer develops in women (R. Medeiros & D. Ramada, 2010). Therefore females are more concerned and thus more well read and knowledgeable on the topic in general compared to males.

Majority of the Chinese respondents scored well in knowledge as compared to other ethnicities, as Chinese women have the highest incidence rate of cervical cancer in Malaysia according to National Cancer Registry (NCR) in 2003, followed by Indian, and Malay (Lim GCC, Rampal S, Halimah Y, 2008). Hence, the Chinese had more awareness of HPV vaccination as they sought more information to protect themselves from contracting this disease. This findings was similar to the study conducted by Rashwan *et al* (2012). The marital status and the positive family history of cervical cancer did not give any prediction to the probable knowledge scores as most of the students were not married and did not have any positive family history of cervical cancer. This could possibly be due to bias in reporting as

respondents may not be forthcoming to disclose of being related to someone who was HPV positive and the stigma from the community towards those who presented with HPV disease in our culturally conservative society curbs any forms of self-disclosure even if an individual or his/her family members were having the infection. (Wong & Sam, 2009).

5.3 Attitude towards HPV Vaccination among Respondents

An earlier report (Tan *et al*, 2010) showed that most of the respondents with good knowledge also presented with good attitude grades. This was a consistent finding in our study as being medical students, they were theoretically more exposed to information regarding the efficacy, effectiveness, side effects of HPV vaccination and other appropriate preventive measures towards HPV infection. Dissemination of this crucial information is utmost important as cervical cancer is the third most common female cancer in Malaysia.

According to our study, there was no significant association between gender and grades of attitude ($p=0.118$), because almost all respondents presented with good attitude in terms of HPV infection prevention. However, there was a significant association between the mean rank of total score of attitude and year of study ($p=0.001$). We postulate that this was because pre-clinical year students learnt only basic theories, while the clinical students had more clinical exposure on various diseases, hence they had more information on how HPV infection is transmitted as well as a better idea on prevalence rate of HPV disease in Malaysia's community (Y. Y. Tan *et al*, 2010).

5.4 Awareness and Source of Information on HPV Vaccination

Most of the students stated that their main source of information about HPV vaccination was obtained from school/university. On the contrary, they preferred to get information regarding

HPV vaccination from their health care providers as their reliable sources. This shows that education plays an important role in promoting HPV vaccination among students (R.Medeiros & D. Ramada, 2010, H. Hesham *et al*, 2012). This finding was however in contrast to the previous study by Y. Y. Tan *et al* (2010) which showed that mass media was the most common source of information regarding HPV vaccination. Apart from that, our study also showed that female respondents had more awareness towards HPV vaccination, whereby majority of them suggested that vaccination should be offered to all boys and girls at the age of 13-14 years old. According to a study conducted by R. Medeiros & D. Ramada (2010), the mean age of commencement of sexual activity was 17 years old for men and 18 years old for women. It showed that female respondents had better understanding and exhibited a more positive attitude towards protecting themselves from the exposure to HPV infection and its related disease. This is because the vaccine is most effective if administered before initiation of sexual activity and should not be delayed, and ideally both male and female should be responsible in preventing the spread of the disease (L. P. Wong, 2008)

5.5 Practise of HPV Vaccination among Respondents

In terms of practice, due to offering of free HPV vaccination regime to them by government under the *catch up programme* (LPPKN, 2012), the First Year respondents presented with a better practice of HPV vaccination. Besides, we also found that female respondents had better practice than male respondents, as most of the male respondents perceived that the HPV vaccination could only be administered to females. This may be partly explained by the lack of offering of HPV vaccination to males by the health care providers, as HPV disease affect females more than males. Besides that, they might know that only lower grades HPV infection are linked to anogenital, penile and anal cancer in men, thus assuming that they will not get involved with cervical cancer which occurs with higher grades HPV infections

(R. Medeiros & D. Ramada, 2010). Moreover, there are two types of HPV vaccines available in Malaysia, the bivalent type which is exclusive for females and the quadrivalent type which is universal for both females and males.

Similar to previous study by Rashwan *et al* (2012), despite good knowledge level and positive attitude towards vaccination, the vaccination rate among respondents was still unsatisfactory. This may be due to the sensitive issue HPV infections are connoted to, which are mainly Cervical Cancer and Sexually Transmitted Diseases (STDs). In our Malaysian setting, our community are still considered fairly conservative towards all these sensitive issues especially so when dealing with sex and STDs as these issues are considered taboo to be openly discussed among some.

Moreover, the cost for 3 doses of HPV vaccination is expensive and this was not favourable to most of the students, whom are still studying and obligated to spend their scholarship for their education purposes. Thus this also led to low vaccination rates. Besides, there may be an element of lack of awareness programme about prevention of cervical cancer in university, or if not so, the students themselves were not actively participating in these awareness events due to lack of interest or too engrossed with other educational or social activities which were more appealing to them. This may explain why most of the unvaccinated respondents were unsure to get themselves vaccinated in future. This result was against the finding by Mehu-Parant F (2010).

From this study, we also found that a minority group of vaccinated respondents showed poor practice. Most of them were female respondents in First Year and Second Year of study, with good knowledge and moderate attitude scores. Their poor score for practice may be attributed

to their lack of confidence to obtain and also disseminate information regarding HPV vaccination to others. Besides that, most of the First Year students felt unconfident to share and get the information about HPV vaccination in detail as they were vaccinated for free under the *catch up* programme by LPPKN. They were also too timid to express their concerns regarding the HPV vaccination but still went along and be vaccinated. This also affected their attitude grades as they did not have proper knowledge on the efficacy and side effects on HPV vaccination. More awareness programmes along with HPV vaccination campaigns conducted conjointly may prove to address this matter, as apart from enlightening the public on HPV infection and HPV vaccination, through this conjointly held programmes, those wanting to get vaccinated after being aware and exposed to the benefits of the vaccine could also do so at the same setting.

The primary reason for refusal was that the respondents claimed that they were not at risk of getting HPV infection or cervical cancer because they were not sexually active. This situation is worrying because as medical students, they should understand that all women are susceptible to get cervical cancer. Thus, more educational programmes should be conducted and the awareness should be emphasized by lecturers during class. This can be achieved via both formal education syllabus as well as informal social awareness campaigns with regards to HPV vaccination.

The second main reason for the refusal was that the vaccine was too expensive. The recommended 3-dose course costs approximately US \$360 (MYR 1200) and is unaffordable for many (L. P. Wong, 2008) even after subsidization, especially by students with scholarship or on study loans.

5.6 Correlation between Knowledge, Attitude and Practice of HPV Vaccination among Respondents

In this study, it also showed that good knowledge and good attitude can lead to good practice among medical students in UPM. This is due to the understanding of the risk of HPV disease and most of the respondents were willing to take initiative in prevention of HPV disease.

5.7 Strength of Study

In this study, the knowledge, attitude and practice of HPV vaccination were not only observed among the female medical students, but also male students. Besides that, this study focused on medical students as they are the future practicing clinicians. Previous study carried out by L. P. Wong & I. C. Sam (2009) and Y. Y. Tan *et al* (2010) targeted on only female students in public universities in Malaysia, regardless of their study programs. Sample of this study showed a balance number of students in terms of year of study, to assess the difference of knowledge, attitude and practice among students in pre-clinical and clinical. This study also observed the association between gender and grade of attitude, year of study and attitude score, correlation between knowledge, attitude and practice. The previous study by Rashwan *et al* (2012) only assessed the knowledge and attitude of HPV vaccination among the female students.

5.8 Limitation

The limitations of this study were the timeframe and diverse academic schedule among medical students from different years of study, as some of the students are having semester break during the data collection period.

5.8.1 Bias

a) Non-response

In this research, the non-respondent bias occurred when the respondents did not return the answered questionnaire or left out some questions without answering them, showing non-committant attitude and refusal to fully participate in the survey causing missing of data for analysis.

b) Misclassification

In this case, the respondents need to understand the questions clearly and answer them honestly. Hence, any misunderstanding or dishonest answer will lead to inaccurate categorization. To reduce the misclassification bias, the researchers will provide clear instructions to the respondents and with extra time, a confrontational interview questionnaire survey may also prove helpful.

5.8.2 Confounding Factors

1. Study environment
2. Health status

5.9 Conclusion

In conclusion, the medical students in UPM showed good knowledge level and good attitude in HPV vaccination. In terms of practice, they showed equally among the respondents who scored good and poor practice. Most of the respondents obtained their information about HPV vaccination from school or university but they preferred to receive information from health care provider.

There was no significant association between gender and attitude grades ($p=0.118$). There was a significant association between year of study and attitude score ($p=0.001$). There was a significant weak, direct linear relationship between knowledge score and total score of attitude towards HPV vaccination ($r_s=0.215, p=0.001$).

Most of the female respondents had the experience of being offered HPV vaccination. But in total, the vaccination rate was unsatisfactory among the respondents (37.8%). Most of the unvaccinated respondents felt unsure to receive HPV vaccination in future and their primary reason was because they think they were not at risk for HPV infection.

There was a significant weak, direct linear relationship between knowledge score and practice score of HPV vaccination among the respondents ($r_s=0.180, p=0.001$). There was a significant moderate, direct linear relationship between attitude score and practice score of HPV vaccination ($r_s=0.319, p=0.001$).

5.10 Recommendation

This study can be improved by recruiting a larger population of medical students in future to reduce the non-response bias for the study, as most of the medical students were busy with their academic activities and declined to participate in this study. A longer time is needed for the questionnaire answering so the respondents can have sufficient time to understand the questions and able to answer the questions clearly. Besides, the respondents should be given clear instructions in future for the multiple choices questions in the study.

The knowledge level can be further improved by organizing educational and awareness programmes together with vaccination programmes among medical students, so they are ready to share and spread the information to their friends and family and also be more open and acceptable to the HPV vaccination themselves. The awareness campaigns should be tailored to be more appealing to the students to ensure a good turn up to these events. The stigma towards HPV vaccination and misconception of risk group should be eliminated through the HPV vaccination awareness campaigns via mass and printed media. The cost of the vaccination should be subsidized or sponsored by the respective ministry of government or NGOs, since the economic status of our country does not allow free vaccination programme for all teenagers. The *catch up programme* or a subsidized HPV vaccination programme could be implemented in stages to students in schools or higher education, but not only limited to certain age group, this is to ensure a wider range of target group for the vaccination (Rashwan *et al*, 2012). It would be ideal if the HPV vaccination could be offered to all susceptible individuals, regardless of their knowledge or educational background as this would offer a wider coverage. The high cost issue of HPV vaccination should not hinder the acceptance of the HPV vaccination programme as the overall cost of vaccination is a much lesser economical burden compared to the cost for the treatment of cervical cancer and its

complication in the long run, with estimated annual direct loss of RM 39.1 million and additional RM12.4 million for the lost productivity in overall economic burden (S. Aljunid *et al*, 2010).



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JKEUPM Ref No. : FPSK_Mei (13)43A(undergraduate)

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Prof. Madya Dr. Johnson Stanslas

Date of approval: 31/5/2013

Endorsed at JKEUPM Meeting on 7/6/2013, attended by:

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Rujukan : UPM/FPSK/(TDAP)600-3/1/3-(SPP3621)

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Prof. Dr. Norlijah Othman,
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Tuan,

MEMOHON KEBENARAN UNTUK MENJALANKAN KAJIAN DI FAKULTI PERUBATAN DAN SAINS KESIHATAN, UNIVERSITI PUTRA MALAYSIA.

Merujuk perkara di atas, saya sebagai ketua projek dan penyelia utama pelajar Tahun 2 Program Perubatan ingin memohon kebenaran dari pihak tuan untuk melakukan kaji selidik di FPSK, UPM. Berikut adalah butir-butir berkenaan kajian yang ingin dilakukan bagi memenuhi keperluan kursus SPP3621 Research Methodology and Project bagi Program Doktor Perubatan Universiti Putra Malaysia.

Tarikh : 25th Mac 2013 – 1st Ogos 2013

Tajuk : **KNOWLEDGE, ATTITUDE AND PRACTICE OF HUMAN PAPILLOMAVIRUS (HPV) VACCINATION AMONG MEDICAL STUDENTS IN FACULTY OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY PUTRA MALAYSIA IN YEAR 2013**

Kaedah : Menjawab borang kaji selidik (questionnaire)

2. Untuk makluman pihak tuan, kajian ini akan dilakukan di FPSK, UPM. Projek penyelidikan ini melibatkan pelajar perubatan Tahun 1, 2, 4 dan 5 bagi tahun 2013 sahaja.
3. Antara tujuan kami mengadakan kaji selidik ini adalah untuk mengkaji tahap pengetahuan, sikap dan amalan suntikan HPV di kalangan pelajar-pelajar perubatan dari Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia



**JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA**

RESPONDENT'S INFORMATION SHEET

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

STUDY TITLE

Knowledge, attitude and practice of Human Papillomavirus (HPV) vaccination among medical students in Faculty of Medicine and Health Sciences, University Putra Malaysia in year 2013

INTRODUCTION

In Malaysia, cancer of the cervix was the third most common cancer among women, after breast cancer and colorectal cancer. Mortality of cervical cancer can be reduced by prevention, early diagnosis with Pap smear screening and early treatment. There are several vaccination programs were introduced in Malaysia. We hypothesized that awareness programs conducted in community will help to successfully implement HPV vaccination in our country, especially towards adolescent group. We target medical students as in a few years' time, these students will be practicing clinicians. Hence, it is important to evaluate the degree of awareness among medical students towards the HPV vaccination, together with their knowledge, attitude of practice of HPV vaccination.

WHAT WILL YOU HAVE TO DO?

Answer the questionnaires issued sincerely.

WHO SHOULD NOT ENTER THE STUDY?

Medical students whom are not available due to academic calendar arrangement during the study.

WHAT WILL BE THE BENEFITS OF THE STUDY:

a) TO YOU AS THE SUBJECT?

You will be able to improve your knowledge toward Human Papillomavirus (HPV) infection diseases and vaccination programme in Malaysia so that your knowledge on this vaccination will be sufficient enough to protect you well in terms of reduced risk from getting infected with HPV virus and protect your family members as well.

b) TO THE INVESTIGATOR?

Your responses will help us in assessing knowledge, attitude and practice of Human Papillomavirus (HPV) vaccination among medical students in UPM, so that to help authorities in proper planning and improvement in educating and increasing the awareness of HPV vaccination of medical students in future.

WHAT ARE THE POSSIBLE RISKS?

There is no significant risk associated with the study.

WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?

Yes, all identities and responses will remain confidential throughout the study.



CONSENT FORM (RESPONDENT)

RESEARCH TITLE :

Knowledge, attitude and practice of Human Papillomavirus (HPV) vaccination among medical students in UPM

RESEARCHER :

- | | |
|-------------------------------|--------|
| 1. Lee Chen Yue | 161431 |
| 2. Asyraf Syafiq bin Zulkifli | 162088 |

..... Identity Card No.

Address.....

..... hereby voluntarily agree to take part in the clinical research (clinical study, questionnaire study/ drug trial) specified above.

I have been informed about the nature of the clinical research in terms of methodology, possible adverse effects and complications (as written in the Respondent Information Sheet). I understand that I have the right to withdraw from this clinical research at any time without assigning any reason whatsoever. I also understand that this study is confidential and all information provided with regards to my identity will remain private and confidential.

I wish / do not wish to know the results of the tests performed on any samples taken from me.

delete where necessary

Signature
(Respondent)

Signature
(Witness)

Date :

Name :

I/C No. :

I confirm that I have explained to the respondent the nature and purpose of the above -mentioned clinical research.

Date :

Signature
(Researcher)

APPENDIX 5: QUESTIONNAIRE

KNOWLEDGE, ATTITUDE AND PRACTICE OF HPV VACCINATION AMONG MEDICAL STUDENTS IN FACULTY OF MEDICINE AND HEALTH SCIENCES, UNIVERSITY PUTRA MALAYSIA

Dear respondents,

We are conducting a research on knowledge, attitude and practice of HPV vaccination among medical students in UPM.

We appreciate your time and effort for answering the following questions sincerely.

ALL identities and responses will remain anonymous and confidential.

A. Socio-demographic

Age:

Sex:

Race:

Year of study: 1st / 2nd / 3rd / 4th / 5th year (circle the appropriate)

Marital status :

Hometown :

Any family history of cervical cancer : Yes/No

Any family history of HPV infection : Yes/No

B. Knowledge

For the next set of questions, please circle the answer TRUE or FALSE.

1. Cervical cancer is common in Malaysia	TRUE	FALSE
2. Cervical cancer is preventable	TRUE	FALSE
3. HPV affects only female	TRUE	FALSE
4. Every HPV infected women will get cervical cancer.	TRUE	FALSE
5. HPV can occur without symptoms	TRUE	FALSE
6. A pap smear can detect the HPV virus	TRUE	FALSE
7. Vaccine for cervical cancer are available in Malaysia for male and female	TRUE	FALSE
8. HPV vaccine are available in Malaysia for free for females aged 18 years old	TRUE	FALSE
9. HPV vaccine has no side effects	TRUE	FALSE
10. Pregnant women can be given HPV vaccine	TRUE	FALSE

11. Cervical cancer is caused by

- ☐ Rotavirus
- ☐ HPV
- ☐ HSV
- ☐ I do not know

12. HPV vaccine are given in

- ☐ 1 dose
- ☐ 2 dose
- ☐ 3 dose
- ☐ I do not know

13. . Which of the following health issues are related to HPV?

- ☐ Cervical cancer
- ☐ HIV
- ☐ Genital warts
- ☐ I do not know

14. How do you think HPV is transmitted or spread?

- ☐ Coughing or sneezing
- ☐ Genital contact
- ☐ Contact with bodily fluids (blood)
- ☐ I do not know

15. How can HPV infection be prevented?

- ☐ By taking antibiotics
- ☐ By using condoms
- ☐ By being vaccinated
- ☐ I do not know

C. Attitude

This next set of questions is about HPV vaccine in general. There are no right or wrong answers. Please answer to the best of your ability.

16. Have you ever heard of the HPV vaccine?

- ☐ Yes (if yes, proceed to question 17)
- ☐ No (If no, proceed straight to question 19)

17. Where did you first hear about the HPV vaccine?

- ☐ My healthcare provider
- ☐ A friend
- ☐ A family member
- ☐ Television or radio
- ☐ Internet
- ☐ Newspaper or magazine
- ☐ At school
- ☐ Other (please list):

-
- ☐ I don't remember

18. From which of the following sources would you prefer to receive information about HPV?

- ☐ Health care provider
- ☐ A friend
- ☐ A family member
- ☐ From lectures
- ☐ Television or radio
- ☐ Internet
- ☐ Newspaper or magazine
- ☐ Others (specify): _____

19. HPV vaccine is a good way to prevent the HPV infection

- ☐ Agree
- ☐ Disagree

20. Potential side effects of the HPV vaccine would prevent me from getting myself vaccinated against HPV.

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

21. Having to get multiple doses of the HPV vaccine would prevent me from getting myself vaccinated against HPV.

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

22. In your opinion, how effective is the HPV vaccine in preventing an HPV infection?

- ☐ Very effective
- ☐ Fairly effective
- ☐ Not very effective
- ☐ Not at all effective
- ☐ Don't know

23. In your opinion, how effective is the HPV vaccine in preventing genital warts?

- ☐ Very effective
- ☐ Fairly effective
- ☐ Not very effective
- ☐ Not at all effective
- ☐ Don't know

24. In your opinion, how effective is the HPV vaccine in preventing cervical cancer?

- ☐ Very effective
- ☐ Fairly effective
- ☐ Not very effective
- ☐ Not at all effective
- ☐ Don't know

25. In your opinion, how safe is the HPV vaccine?

- ☐ Very safe
- ☐ Fairly safe
- ☐ Not very safe
- ☐ Not at all safe
- ☐ Don't know

26. In your opinion, how likely is the HPV vaccine to cause other health problems?

- ☐ Very likely
- ☐ Likely
- ☐ Unlikely
- ☐ Very unlikely
- ☐ Don't know

27. If the HPV vaccine were offered to you, how likely is it that you would get the HPV vaccine for yourself?

- ☐ Very likely
- ☐ Likely
- ☐ Not sure
- ☐ Unlikely
- ☐ Very unlikely

28. In your opinion, at what age should vaccination against HPV start:

- ☐ Earlier than age 9
- ☐ 9-10
- ☐ 11-12
- ☐ 13-14
- ☐ 15-16
- ☐ 17-18
- ☐ 19 or older
- ☐ Never

29. In your opinion, who do you think should get the HPV vaccine?

- ☐ All girls
- ☐ All boys
- ☐ All boys and girls
- ☐ Anyone who is sexually active
- ☐ No one

Please tell us how much you agree or disagree with the following statements:

		Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
30.	I would be embarrassed if myself/family members got HPV					
31.	I would be concerned if myself/family members got HPV					
32.	I believe that vaccine should be required for contagious disease that can be spread person-to-person					
33.	Potential side effects of the HPV vaccine would prevent me from getting myself vaccinated against HPV					
34.	Having to get multiple doses of the HPV vaccine would prevent me from getting myself vaccinated against HPV					

D. Practise

35. Have you ever been offered the HPV vaccine by your health care provider?

- ☐ Yes
- ☐ No
- ☐ I don't know

36. Have you ever received the HPV vaccine?

- ☐ Yes
- ☐ No
- ☐ I do not know

37. How likely is it that you will get yourself vaccinated against HPV in the future?

- ☐ Very likely
- ☐ Likely
- ☐ Not Sure
- ☐ Unlikely
- ☐ Very unlikely

38. What is your main reason for not receiving HPV vaccination?

- ☐ Lack of confidence with the vaccination
- ☐ Lack of knowledge towards HPV vaccination
- ☐ Stigma and embarrassment of receiving a HPV vaccination
- ☐ Personal experience
- ☐ The vaccination is against my religious/ culture belief
- ☐ The cost for HPV vaccination is expensive for me
- ☐ I think I'm not in the risk group of getting HPV infection or cervical cancer

Below are some things involved in making a decision about getting the HPV vaccine for you. Please tell us how confident you feel in doing the following things:

Please tick on the answer in the column provided.

No.	Questions	Not confident at all	Not very confident	Somewhat confident	Very confident	I do not know
39.	Get the information need to make a decision about vaccinating yourself					
40.	Get the facts about the benefits of HPV vaccination					
41.	Get the facts about the risk of HPV vaccine					
42.	Ask your health care provider questions about the HPV vaccine without feeling dumb					
43.	Express your concern about the HPV vaccines to your health care provider					
44.	Ask for advice about vaccinating yourself					

For the next set of questions, please circle the answer YES or NO.

45.	Do you know anyone who has had HPV infection such as genital warts?	YES	NO
46.	Have you yourself being infected with HPV infection (i.e. Genital warts, cervical cancer)	YES	NO
47.	Do you know anyone who has had cervical cancer? if yes, please specify who: _____	YES	NO
48.	Are you willing to educate your friends and family to get the HPV vaccination to protect them?	YES	NO
49.	As a future doctor, will you inform your patients the importance and benefits of getting HPV vaccination? If no, please specify why: _____ _____	YES	NO
50.	As a future doctor, will you offer the HPV vaccination to patients? If no, please specify why: _____ _____ _____	YES	NO
51.	As a future doctor, will you recommend your patients and family members to receive HPV vaccination even if you do not vaccinate yourself?	YES	NO

Table 17: Gantt Chart

[illegible][illegible]

APPENDIX 7: RESEARCH TEAM

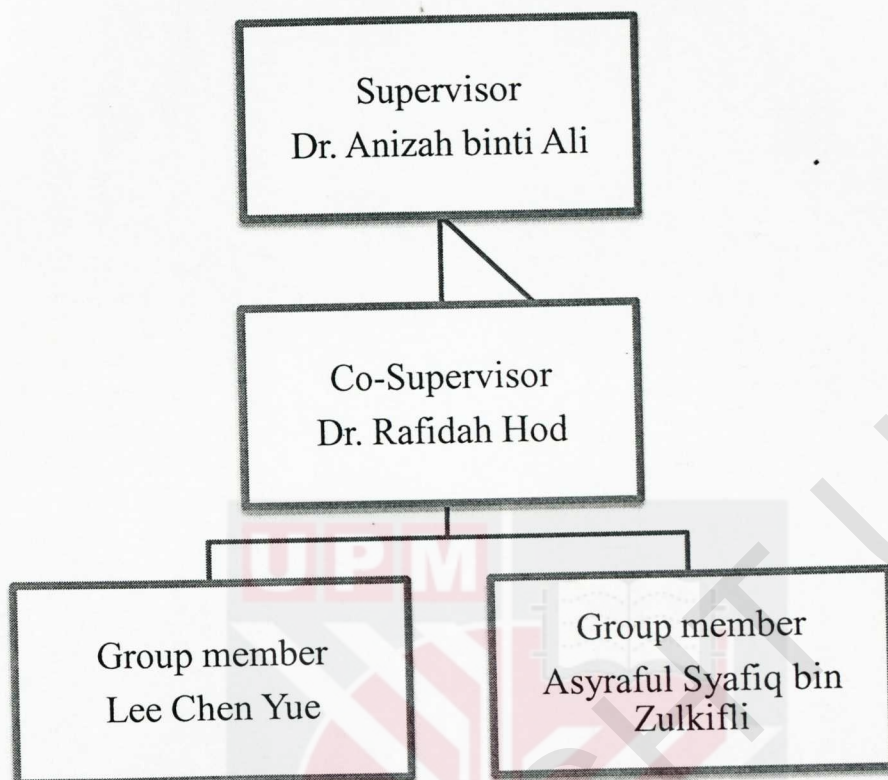


Figure 6: Research Team

APPENDIX 8: RESEARCH BUDGET

Table 18: Research Budget

No.	Items	Estimated cost (RM)
1.	Stationeries	20
2.	Documents Photostatting	150
3.	Documents Printing and Binding	100
4.	Miscellaneous	30
Total		300