A STUDY ON KNOWLEDGE, DECISION-MAKING AND ACCEPTANCE OF HUMAN PAPILLOMA VIRUS VACCINATION AMONG PARENTS OF PRIMARY SCHOOL STUDENTS IN KOTA BHARU

By

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LIST OF ABBREVIATIONS

BM	Bahasa Malaysia
CI	Confidence Interval
FDA	US Food and Drugs Administration
HPV	Human Papilloma Virus
JPNK	Jabatan Pendidikan Negeri Kelantan
NHMS	National Health and Morbidity Survey
RM	Ringgit Malaysia
SD	Standard Deviation
SK	Sekolah Kebangsaan
SPSS	Statistical Package for Social Sciences
USPSTF	US Preventive Services Task Force
VIF	Variance Inflation Factor
VLP	Virus-like particles
WHO	World Health Organisation

ABSTRACT

English Version

Titile: Study on Knowledge, Decision Making and Acceptance of Human Papilloma Virus Vaccination among Parents of Primary School Students in Kota Bharu.

Introduction: Human Papilloma Virus Vaccine plays an important role in HPV related illness prevention. Cervical cancer is the second most common cancer in women and forth most common cancer in the entire general population in Malaysia. The primary prevention, HPV vaccine is approved as national vaccination program for females in Malaysia. Children rely on parents not only for the consent but for the guidance and information about the vaccines.

Objectives: The study aims to describe knowledge, decision-making and acceptance of Human Papillomavirus (HPV) vaccination among parents of Primary School students and its associated factors.

Methodology: This cross sectional study was conducted among 280 parents of primary school students in Kota Bharu from January 2015 till May 2015. Systemic random sampling and a validated self-administered questionnaire was used to assess knowledge of HPV vaccination. Data was analysed using SPSS ver 22.

Result: Proportion of good knowledge among parents in Kota Bharu was 38%. Most decision regarding vaccination was a shared decision, 72%. The proportion of

acceptance of HPV vaccine for girls was 63%. Age and knowledge show significant association with HPV vaccine acceptance. Parents with good level of knowledge were more likely to accept HPV vaccine.

Conclusion: Majority of parents had poor knowledge of HPV vaccine despite the implementation of the HPV vaccine since 2010. Vaccine acceptance is dependent on the level of knowledge. Parents play an important role in determining the success of HPV vaccine program. The trend of decision-making has changed in Malaysian family as most couples make shared decisions in allowing vaccinations on their child as compared to traditionally decision making by father.

Malay Version

Tajuk: Kajian Mengenai Pengetahuan, Membuat keputusan, dan Penerimaan Vaksinasi Human Papilloma Virus Di Kalangan Ibu Bapa Pelajar Sekolah Kebangsaan Di Kota Bharu.

Pengenalan: Human Virus Papilloma (HPV) vaksin memainkan peranan yang penting dalam pencegahan penyakit yang berkaitan HPV. Kanser serviks merupakan kanser kedua di kalangan wanita dan kanser keempat secara keseluruhan di Malaysia. Sebagai pencegahan primer, vaksin HPV diluluskan sebagai salah satu program vaksinasi kebangsaan bagi wanita di Malaysia. Kanak-kanak bergantung kepada ibu bapa bukan sahaja untuk mendapatkan kebenaran vaksinasi tetapi juga untuk bimbingan dan maklumat mengenai vaksin.

Objektif: Kajian ini adalah untuk mengambarkan pengetahuan, membuat keputusan dan penerimaan vaksin HPV, dan faktor yang berkaitan dengan penerimaan terhadap HPV vaksin di kalangan ibubapa.

Metodologi: Kajian keratan rentas telah dijalankan di kalangan 280 ibu bapa pelajar sekolah rendah di Kota Bharu dari Januari 2015 hingga Mei 2015. Persampelan rawak sistematik dan soalan kaji selidik digunakan untuk menilai pengetahuan mengenai vaksinasi HPV. Data dianalisis menggunakan SPSS ver 22.

Result: Ibu bapa yang mempunyai pengetahuan yang baik di Kota Bharu adalah 38%. Kebanyakkan keputusan mengenai vaksinasi adalah keputusan bersama, iaitu 72%. Peratusan penerimaan vaksin HPV untuk kanak-kanak perempuan adalah 63%. Umur dan pengetahuan menunjukkan hubungan yang signifikan dengan penerimaan vaksin HPV. Ibu bapa yang mempunyai tahap pengetahuan yang baik lebih cenderung untuk menerima vaksin HPV.

Kesimpulan: Majoriti ibu bapa mempunyai pengetahuan yang lemah tentang vaksin HPV walaupun pelaksanaan vaksin HPV sejak 2010. Penerimaan vaksin adalah bergantung kepada tahap pengetahuan. Ibu bapa memainkan peranan penting dalam menentukan kejayaan program vaksin HPV. Kecenderungan dalam membuat keputusan telah berubah dalam keluarga. Malaysia kerana kebanyakan pasangan membuat keputusan bersama dalam membolehkan vaksin pada anak-anak mereka berbanding dengan tradisi membuat keputusan oleh bapa.

A Study on Knowledge, Decision Making and Acceptance of Human Papilloma Virus Vaccination among Parents of Primary School Students in Kota Bharu

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INTRODUCTION: Cervical cancer is the second most common cancer in women and fifth most common cancer in the entire general population in Malaysia. The ultimate cause of cervical cancer is Human Papilloma Virus. Malaysia is the first country in South East Asia implements school based vaccination, which is free vaccine to 13 years old girls in government and private schools starting in 2010. However it is a voluntary HPV immunization program, which required parental written consent. Therefore children rely on parents not only for the consent even for the guidance and information about the vaccines.

OBJECTIVES: The study to determine parental knowledge, decision making, acceptance of HPV vaccination, and factors associated with acceptance.

METHODS: This cross sectional study was conducted among 280 parents of primary school students in Kota Bharu from January until May 2015. Systemic random sampling and a validated self administered questionnaire was used to assess knowledge of HPV vaccination. Data was analysed using SPSS ver 22.

RESULTS: Parents with good knowledge in Kota Bharu was 38% and 62% was poor. Most decision regarding vaccination was a shared decision, 72%. The proportion of acceptance was 63%. Our results showed that the acceptance increases more amongst older age and good knowledge groups of parents.

CONCLUSION: Parent's level of knowledge is poor despite the implementation of the HPV vaccine since 2010. The identified factors that associated

with acceptance on HPV vaccination were age and knowledge. Parents play an important role in determining the success of HPV vaccine program. The trend of decision making has changed in Malaysian family as most couples make joint decisions in allowing vaccinations on their child as compared to traditionally decision making by father

Associate Prof. Dr Juwita binti Shaaban : Supervisor
Dr Siti Suhaila binti Mohd Yusoff : Co - Supervisor

CHAPTER 1

INTRODUCTION

Cancer is one of the common causes of death in Malaysia. Worldwide, cervical cancer is the fourth most common cancer in women (1). In Malaysia, cervical cancer is ranked second among all cancers in women aged 15 to 44 years after breast cancer (1). The incidence of cervical cancer in younger women rose dramatically during the decades. This trend is a worrisome as it affects future generations and it occurs in their prime productive years.

The ten leading cancers among Kelantan female population in 2007-2011 were breast (35%), colorectal (12.5%), leukaemia (5%), bladder (5%), liver (5%), cervical (5%), oesophagus (5%), tongue (2.5%), stomach (2.5%) and ovary (2.5%)(69).

Cervical cancer is an important public health concern because of the high burden of the disease and the potential of prevention with effective screening program (2). Pap Smears is important as screening program as nationwide screening showed successful reduction in cervical cancer incidence up to 80% (3). However, despite awareness campaigns done by government and non-government agencies, Pap smear screening performance in Malaysia remained low (4,9). The ultimate cause of cervical cancer is Human Papilloma Virus. Among the symptoms of cervical cancer are vaginal bleeding after intercourse and bleeding between periods. Unfortunately the early stages of the disease, there are often no obvious signs or symptoms (5).

Health status is a milestone in the progress of a nation. In order to live an adaptive life despite globalization, Malaysia needs to negotiate between the demands of development and the goal to have good community health. Thus vaccination of young women is a cost effective strategy against cervical cancers in accordance with the vision of Ministry of Health Malaysia, Prevention Measure (6). Particularly managing cervical cancer should be allocated into preventive strategies, which are screening and vaccination (2,6,64).

In view of the importance of HPV vaccination, Malaysia is the first country in South East Asia to implement national HPV immunization programs as proposed by WHO, included in national vaccination programs under School Health Unit (Public Health, Ministry of Health). Malaysia implements school based vaccination, which is free vaccine to 13 years old girls in government and private schools starting in 2010. It is a voluntary HPV immunization program, which required parental written consent. HPV vaccine is given at 0, 1, and 6 months schedule, which target to be completed 3 doses program within school calendar year (7,8).

1.1 JUSTIFICATION OF THE STUDY

The ultimate purpose of vaccination is for prevention. In Malaysia, the HPV vaccine has just received regulatory approval. We are likely to face challenges to implementing HPV vaccination.

The study is designated to describe knowledge and acceptance of Human Papillomavirus vaccine among parents in Kota Bharu, At the same time the study also aims to describe decision-making among parents in our culture that associated with successful vaccination. It is importance as Malaysia policy has implemented HPV vaccination as school based program immunization for all Form 1 students irrespective of actual age in 2010 whereby written parental consent is required (7). Although HPV vaccine is free for all Form 1 Malaysian girls but there are still parents who refuse to grant HPV vaccine to their daughter. Hence, finding of the study hopefully may benefit to engage with parents earlier.

An understanding of factors that influenced parental acceptance of HPV vaccine is important to develop effective intervention strategies to achieve good outcomes such as zero refusal as well as to improve economic health of Malaysia. Success of vaccine relies on parents' willingness to vaccinate the daughter (10).

As a conclusion, rationale and benefits of study is important to describe knowledge, decision-making and acceptance of Human Papillomavirus (HPV) vaccination among parents, which would assist to an improvement of knowledge among Malaysians after the implementation. By exploring parents' perspectives of

knowledge and acceptability, the study might help to increase awareness and acceptance of Pap smear among women in Malaysia and appropriate intervention can be organized to overcome the obstacles.

CHAPTER 2

LITERATURE REVIEW

1) Burden of HPV related cancer

Cancer is a major public health concern in Malaysia. HPV strongly related with anogenital and head and neck cancers (1). There is an increasing evidence strongly linking HPV DNA with cancers of cervical, anus, vulva, vagina and penis. However cancers of anus, vulva, vagina and penis are less frequent compared to cervical cancer. But their association with HPV make them potential preventable with HPV vaccination (1).

Cervical cancer is the fourth most common cancer in women worldwide in 2012 (1). The majority of cases are squamous cell carcinoma followed by adenocarcinoma (5). In Malaysia, women at risk for cervical cancer is as early as aged 15. Hence approximately about 2145 incidence of cervical cancer are diagnosed annually in 2012. Cervical cancer is the 2nd cause of female cancer. In Kelantan, cervical cancer is the 5th leading cancer and ranked 2nd after breast cancer among women for the period of 1999 till 2003 (1). Even from 2007 till 2011 cervical cancer is the 10th commonest cancer among female population in Kelantan (69). Breast (26.3%), colorectal (11.5%), ovary (8.2%), thyroid (7.5%), trachea, bronchus, lung (6.2%), cervical (5.7%), leukemia (5.1%), uterus (3.9%), lymphoma (3.8%) and liver (2.8%)

Overall, the mortality; cervical cancer ranks as the 5th leading cause of cancer deaths in women and 621 new cervical cancer deaths occur annually in Malaysia (1).

2) Risk factors for cervical cancer

The ultimate cause of cervical cancer is Human Papilloma Virus infection (1,5,14). The most frequent HPV oncogenic types among women with invasive cervical cancer by histology in Malaysia are HPV 16 and HPV 18 (11). Four major steps are involved in cervical cancer development following HPV infection: HPV infection, viral persistence, progression to precancerous lesion, and invasion through the basement membrane of the epithelium (1). Persistent infections and precancerous lesion are established within 5-10 years in less than 10% of new infections. Thus invasive cancer may arise in women with precancerous lesion over many years (1,3,4,5).

Sexual intercourse is the primary route of transmission of genital HPV infection. Therefore early exposure to sexual activity at age of less than 16 years, more than four sexual partners and history of genital warts are associated with high risk of cervical cancer (1,5,12). But male circumcision and the use of condoms have shown a significant protective effect against HPV transmission (1,5). Other cofactors that contribute to progression of cervical cancer are smoking, high parity, long-term hormonal contraceptive use and co-infection with HIV (1,13).

Apart from HIV, co-infection with Chlamydia and herpes simplex virus type-2 and immunosuppression are other probable factors (1).

3) HPV preventive strategies

Pap smear test is an established and well organized cervical screening program in Malaysia since 1960s which was available at all government health facilities and

hospitals as well as private settings (5). In order to limit the burden of cervical cancer, preventive strategy should be allocated-screening and vaccination. A study of cost-effectiveness of HPV in the prevention of cervical cancer in Malaysia was done by Universiti Kebangsaan Malaysia in 2007, showed that government spends RM382 million for cervical cancer treatment a year, whereby providing the vaccine only cost RM150 million a year to prevent cervical cancer (15). Thus vaccination of young women is a cost effective strategy against cervical cancers which accordance with the vision of Ministry of Health Malaysia, Prevention Measure.

The introduction of HPV vaccine in 2010 as a national program, which are school based program and available on a limited or universal basis through the public sector. HPV vaccination could also effectively reduce the burden of cervical cancer in the coming decades. Primary target are school students aged 13. HPV coverage is 3 doses for routine immunization (7,8). Licensure of HPV vaccine for the quadrivalent and bivalent vaccines is approved (11).

In 2006, US Food and Drug Administration (FDA) approved prophylactic vaccine of HPV. Aged between 9 to 26 years are recommended (16). The vaccines are made from non-infectious HPV virus-like particles (VLPs). There are two types of vaccine are licensed by FDA. The bivalent HPV (Cervarix) prevents the 16 and 18 HPV types, which cause 70% of cervical cancers. The quadrivalent vaccine (Gardasil) prevents four HPV types 6, 11, 16, 18, which type 6 and 11 can cause 90% genital warts. Only the quadrivalent vaccine is used for males. Both of the vaccines have no therapeutic effect on HPV-related disease (11,16). However both vaccines have shown excellent efficacy and safety (11,16). Ideally quadrivalent HPV vaccine is

routinely recommended, as 90.7-100% effective in preventing infection of the four HPV types, safe and halal (17). Recommendation of HPV vaccine is vary across countries.

4) Screening coverage and prevalence Pap smear

Despite all these facts, Pap smear is the most widely used screening method for cervical cancer. Furthermore it has been available in Malaysia since 1960s. But no reduction in cervical cancer prevalence has been documented (18). The National Health and Morbidity Survey also revealed that national prevalence of Pap smear was 43.7% and only 59.7% done within last 3 years (19). Furthermore Othman et.al has been able to show that in 2000 and 2006, among cervical cancer who diagnosed in major hospitals in Malaysia, 48% reported never having a pap smear and 95% did not have a smear within the past three years (4).

Ministry of Health Malaysia recommended that all women age 20 until 65 years old, who are, or who have been sexually active, to undergo Pap smear testing. If two consecutive yearly tests are negative, screening every three years is recommended (5). American Cancer Society and U.S Preventive Services Task Force (USPSTF) recommended screening in women age 21 to 65 years with Pap smear every three years (20,21). In terms of screening guidelines, although there is much variation between countries, there is an overall lowest uptake of cervical cancer screening among Asian women in U.S (22).

5) Prevalence of HPV vaccine acceptance

In Malaysia, the immunization coverage of a complete three dosage of HPV was achieved (87.12%) among 13 years old girl in 2011 (1). HPV vaccine is given at 0, 1, and 6 months schedule, which target to be completed 3 doses program within school calendar year. School Health Unit (Public Health, Ministry of Health) is responsible for handling HPV vaccination. However it is a voluntary HPV immunization program, which required parental written consent. HPV vaccination availability may differ from country to country (1). A cross-sectional study among mothers in 2007 showed 65.7% accepted HPV vaccine for their daughters. However, many of mothers (83.9%) were unwilling to vaccinate their children if they had to pay but the acceptability rate increased to 97.8% if it was routine and freely available (23). Data from Jabatan Kesihatan Negeri Kelantan, revealed 353 (2.1%) in 2012 and 285 (1.6%) in 2013 parents refused HPV vaccine to be administered to their daughter in school. Tanah Merah (3.6%), Kota Bharu (2.5%), Tumpat (2.4%) are among the most refusal of HPV vaccine (24). Regarding the recommendations for HPV vaccine uptake among girls of secondary school, a few studies reported that there were encouragement by health care workers, teachers, parents and friends (25,31).

6) Barriers for HPV vaccination

Major obstacles to acceptability included high cost, fear of side effects, multiple injections and social stigma (10). Cost of the HPV vaccine is a serious barrier to the success of the vaccination program in Malaysia before 2010 (10). Parents may fear that vaccination might promote sexuality and result in increased unsafe sexual behavior (23, 26, 27). And due to religious and moral values, some may

perceive that their children are at low risk for contracting the infection, and thus believe that vaccination is unnecessary (27).

In addition there are also parents who are concerned about the efficacy and safety of the vaccines (10). HPV vaccines have high efficacy and safety for use in young women aged 9-26 years old. Safety, effectiveness, halal, social stigma, Pap smear test and informed consent are amongst the challenges towards HPV vaccination (10). Sexual issues are taboo in many Asian culture, parents may find it difficult to explain to their children the need for vaccination against sexual transmitted infections (10).

7) Associated factors for HPV vaccine acceptance

i. Socio demographic

Most of the studies have look into factors that influence level of knowledge and acceptance of HPV vaccine among women from various groups in Malaysia. Age, marital status, education level, employment and income were found to be important factors for knowledge and acceptability. The studies by Archin et al, Madhivanan et al and Lisen et al looked at demographic factors associated with parental attitudes towards HPV vaccination (26,27,28). Factors for acceptance on HPV vaccine include age (23,47), gender (42,46), education level (46), employment status (46), and income (23,46).

A few studies mentioned factors significantly associated with increased HPV vaccine acceptance were increasing age, female gender, higher education attainment, and low household income (10, 23, 25-29).

ii. Knowledge

The studies on knowledge on HPV infection and vaccination were conducted in various groups including secondary school students (26,31), teachers (26), parents (26), university students (34) and other groups of women from various level of education (32,33). They concluded that overall knowledge on HPV infection, vaccination and cervical cancer is poor and that knowledge translated to vaccine acceptance. The general lack of knowledge about HPV is a major factor that might adversely affect HPV vaccine acceptability.

iii. Decision making

Factors that influences on HPV vaccination decision were physician recommendations, parental and adolescents attitudes and knowledge, social environmental-factors, institutional policies and interventions related to vaccine (35). Cultural beliefs and values intervene in the decisions among parents (35). Cultural values imply a widely held belief that has been internalized by individuals, as well as a general guide for some set of activities and behavior rules for them. It was found that there is no difference in sex role orientation among the families (36). Also it was found that wives with higher levels of education have more role orientation in decision making. The wives' relatively was found for the purchase of furniture, electrical appliances and groceries (36). The husbands have more role of decision making in the major decisions such as health, education and insurance (36). Fathers appeared to be less acceptance and knowledge as compared to mothers pertaining to HPV vaccination (26, 27, 28).

CONCEPTUAL FRAME WORK

Study on Knowledge, Decision Making and Acceptance of HPV Vaccination among Parents of Primary School Students in Kota Bharu, Kelantan

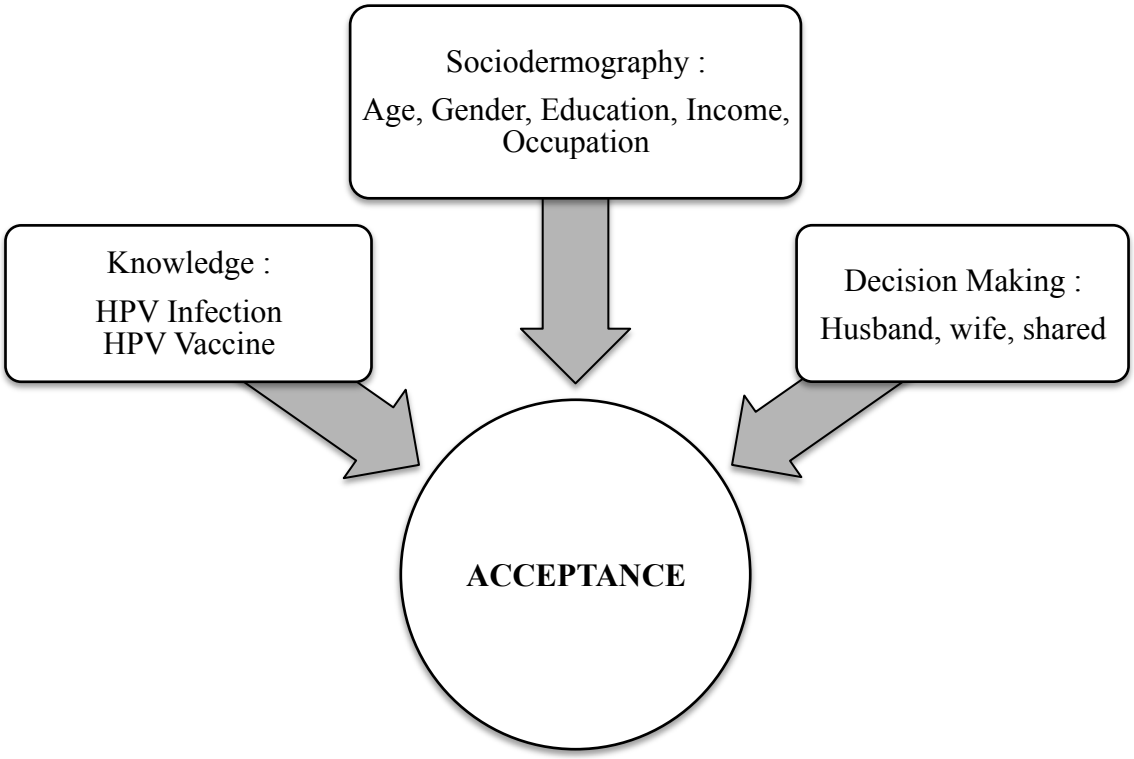

FIGURE 2.1: CONCEPTUAL FRAMEWORK

CHAPTER 3

OBJECTIVES

3.1 General

The study aims to describe knowledge, decision-making and acceptance of Human Papillomavirus (HPV) vaccination among parents of Primary School students and its associated factors.

3.2 Specific

1) To describe parental knowledge on HPV vaccination
2) To describe proportion of acceptance on HPV vaccination among parents
3) To describe decision making pattern among parents on HPV vaccination
4) To determine associated factors for acceptance on HPV vaccination among parents of primary school students
   - Socio-demography
   - Knowledge
   - Decision-making.

3.3 RESEARCH HYPOTHESES

There are association between socio demographic (age, gender, education level, employment status, household income), knowledge and decision-making towards acceptance of HPV vaccination.

CHAPTER 4

METHODOLOGY

4.1 Study Design

This school-based cross sectional study was conducted among 330 parents of primary school students in Kota Bharu.

4.2 Study Area

This study was conducted at 10 primary schools in Kota Bharu. Kota Bharu district was chosen in the study because among the highest rate of refusal on HPV vaccine among parents (24).

4.3 Populations and Sample

4.3.1) Reference Population

All parents of primary school Standard 5 students, in Kota Bharu

4.3.2) Source Population

Parents of Standard 5 students in ten primary schools from January till May 2015. The selection of schools were determined by Jabatan Pendidikan Negeri Kelantan.

4.3.3) Criteria Subject

Inclusion criteria

Parents with daughter/s, who is in primary school aged 9-12 years old

Exclusion criteria

Non-Malaysian

Unable to read and understand Malay and English

4.3.4) Sampling frame

All parents of standard 5 students that fulfill the conditions set.

4.3.5) Sample Size

Sample size calculation was calculated for all the objectives. However the one that yield the biggest number was chosen as the sample size.

Objective 1 i.e. To describe proportion of parental knowledge of HPV vaccination, Single Proportion Formula is used

$$\mathbf{n = \frac{Z^2\ P(1-P)}{\Delta^2}} \qquad \frac{1.96^2\ 0.206\ (1-0.206)}{0.05^2}$$

- n = Minimum required sample size
- Z = Value of standard normal distribution = 1.96
- Δ = Precision = 0.05
- P = Proportion of good parental knowledge of HPV vaccination in Thailand = 0.206 (26)

Taking the precision of 0.05 with 95% confidence, the minimum required sample size was 255. However, after considering the non-response rate of 30%, the sample size calculated was 331.

Objective 2 i.e. To describe proportion of acceptance on HPV vaccine among parents, Single Proportion Formula is used

$$\mathbf{n = \frac{Z^2 P(1-P)}{\Delta^2}} \qquad \frac{1.96^2\ 0.961\ (1-0.961)}{0.03^2}$$

- n = Minimum required sample size
- Z = Value of standard normal distribution = 1.96
- Δ = Precision = 0.03
- P = Proportion acceptance of HPV vaccine among parents in Indonesia = 0.961 (47)

Taking the precision of 0.03 with 95% confidence, the minimum required sample size was 160. However, after considering the non-response rate of 30%, the sample size calculated was 208.

Objective 3 i.e. To describe decision-making pattern among parents on HPV vaccination, Single Proportion Formula is used

$$\mathbf{n = \frac{Z^2 P(1-P)}{\Delta^2}} \qquad \frac{1.96^2\ 0.144\ (1-0.144)}{0.05^2}$$

- n = Minimum required sample size
- Z = Value of standard normal distribution = 1.96
- Δ = Precision = 0.05
- P = Proportion mothers willing to vaccinate their daughters in Turkey = 0.144 (68)

Taking the precision of 0.05 with 95% confidence, the minimum required sample size was 189. However, after considering the non-response rate of 30%, the sample size calculated was 246.

Objective 4 i.e. To determine associated factors for acceptance on HPV vaccination among parents of primary school students. Sample size calculation was using Power and Sample Size Calculation software. Sample size for categorical variables was calculated using Comparing Two Proportions formula.

- Level of significance α 0.05
- Power $1-\beta = 0.8$
- P_0 = Proportion of good knowledge among parents in Thailand was 70%
- P_1 = Proportion of good knowledge parents amongst parental acceptance was 50%
- m = 1(ratio of good knowledge and poor knowledge)

The sample size was 90. After considering non-response rate of 30%, the calculated sample size was 117.

Comparing Two Means formula was used to calculate sample size for numerical variable. The calculation of sample size was as follows :

- Level of significance α 0.05
- Power $1-\beta = 0.8$
- σ = Standard deviation of mean age = 4.68
- δ = Expected detectable difference mean age between agree and not agree = 4
- m = 1

The sample size was 42. After considering non-response rate of 30%, the calculated sample size was 55.

Summary of the sample size calculation for objective 3 is tabulated in Table 4.1 and Table 4.2.

Table 4.1: Sample size calculation for categorical variables by Comparing Two Proportion

Variables	**P_0**	**P_1**	**Minimum sample size(n)**	**n + 30% non-response rate**
Good knowledge (26)	0.7	0.5	90	117
Decision making (father) (26)	0.39	0.16	55	72
Gender (female) (26)	0.82	0.41	18	23

Table 4.2: Sample size calculation for numerical variable by Comparing Two Means

Variable	**σ**	**δ**	**Minimum sample size(n)**	**n + 30% non-response rate**
Mean age (26)	4.68	4	42	55

Since the largest sample size in this study was from objective no 1(n=331), thus 330 were taken as sample size for the study.

4.3.6) Sampling Method

Multistage Sampling

A list of 96 primary schools in Kota Bharu was identified from Jabatan Pendidikan Negeri Kelantan (JPNK). Ten schools were chosen to involve in the study. The selection of the schools was determined by JPNK. The schools were SK Tapang, SK Panji, SK Kubang Kerian (1), SK Kubang Kerian (3), SK Pasir Hor, SK

Demit, SK Demit 2, SK Zainab 1, SK Zainab 2, and SK Sultan Ismail. The sample units were parents of standard five students. Standard six students were not chosen as Ministry of Education Malaysia does not encourage research to be conducted on students who are taking National exams. Three classes were selected from all standard five classes for each school by simple random sampling. Eleven students were selected by systematic random sampling from the list of students in selected classes. There were 35 to 40 students in each selected class. Students with no female siblings aged 9 to 12 were excluded. For SK Tapang, SK Panji, SK Kubang Kerian (1), SK Kubang Kerian (3) and SK Pasir Hor, all the students with odd number were selected starting from number 'one'. While for SK Demit, SK Demit 2, SK Zainab 1, SK Zainab 2, and SK Sultan Ismail, all the students with even number were selected starting with number 'two'.

4.4 Operational Definitions

i. **Knowledge** refers to whether good or poor knowledge based on total scoring of questionnaire. Score of more than 70 is considered as good knowledge and 70 and below is poor knowledge (31).

   HPV vaccination refers to HPV infection and HPV vaccine.

ii. **Decision-making pattern** refers to whether mutual or non-mutual decision by parents on HPV vaccination. Non-mutual decision is either by husband or wife. Mutual decision is a shared decision, which husband and wife did the decision together.

iii. **Acceptance** refers to either agree or not agree in allowing HPV vaccine to the daughters.

iv. **Education level** refers to primary (Primary school education), secondary (Secondary school education) or tertiary (University education) based on Malaysia Education Systems.

v. **Household income** refers to men or women who are the head of household and members who live with total monthly household income. A household can have more than one income recipient. The income can be received from paid employment, self- employed, and income from property and investments (37, 38).

4.5 Research Tools

The research tools composed of self-administered questionnaires that were divided into 4 sections:

a. Socio-demographic data
b. Knowledge on HPV infection and HPV vaccine
c. Acceptance of HPV vaccination
d. Decision-making

i. Socio-demographic data consists of 8 questions regarding age; gender; race; relationship with student; marital status; education level; employment status and household income.

ii. Knowledge on HPV vaccination (HPV infection and HPV vaccine)

This was a modified questionnaire to assess knowledge of HPV vaccination among parents of primary school students (26,32). The questionnaire was developed in stages. The first stage involved reviewing the literatures on knowledge on HPV vaccination among parents, students, teachers and women. Then, these factors were arranged into domains. In the second stage, several series of discussion were done with Family Medicine Specialist to get the expert opinions, in order to ensure good content validity and comprehensiveness of the questionnaire. All items were constructed in English and Malay languages. This was a self-administered questionnaire, which consists of 2 domains and 13 items. Two domains that were assessed through this questionnaire are HPV infection and HPV vaccine.

Backward – Forward Translation

The research team translated the original English questions into Bahasa Malaysia (BM) language. At the same time the English original version was given to individual in Pusat Bahasa Universiti Sains Malaysia to translate into BM. The translated BM version then was given to another individual in Pusat Bahasa to translate back into English. The three versions were compared and discussed for the final preliminary version.

Scoring of Knowledge questionnaire

The questionnaire were using Yes, No, or Do not know. All items were scored 1 for correct answer and 0 for wrong answer or do not know (31). Mean score was calculated for comparison.

The questionnaire reviewed by peers for face validity. A pilot study was conducted in Pasir Puteh district. The reliability of the questionnaire was evaluated among 65 parents of primary school students at SK Pasir Puteh (P). Analysis of the pilot study was done including internal consistency validity using Cronbach's alpha and exploratory factor analysis that evaluate the construct validity. The content validity was verified and then adjusted after obtaining the recommendations of the experts. Several problematic items were rephrased. The final questionnaire consisted of 13 items. The result of pilot study is shown in Table 4.3.

Table 4.3: Summary result of pilot study (n=65)

Domain	**No. of items selected**	**Factor loading [a]**	**Cronbach's α**
HPV infection	4	0.59 – 0.78	0.64
HPV vaccine	9	0.68 – 0.87	0.80

α = Cronbach's alpha

[a] Factor loading, using Principle Component Data Extraction Method and Varimax Rotation.

From the result, the items analysis were satisfactory as the Cronbach α 0.64 and 0.80 with overall Cronbach α of 0.86. The final set was attached in Appendix IV.

iii. Acceptance of HPV vaccination

One question with two options (Agree or Not agree), which needs to choose only one answer

iv. Decision-making

One question with three options (Make own decision, Make joint decision with spouse or Spouse make decision), which needs to choose only one answer

4.6 Data Collection and Procedures

The questionnaire was administered between January and May 2015. In order to distribute the questionnaire to the parents, teacher advisor was assigned by each selected school. Before enrollment, study objectives and questionnaire were explained to the teachers. They were also trained on how to distribute the questionnaire using systematic random sampling.

The questionnaires were distributed to students by teacher advisor of each school. The selected students were given clear instructions regarding self-administered questionnaire that need to be filled up by parents and submission within a week to respective teacher. Written consent was obtained from the parents and they were given written information about the conduct of the study enclosed with the questionnaire form. The questionnaire set was sealed in the envelope. At the same time, if there were any query pertaining to the study and questionnaires, contact number of researcher also included in the form. For those, who not submitted the questionnaire within a week, the advisor teacher would call the parents. And will consider as no response if the parents still not submitted the questionnaire within 3

days. Because of the teacher involvement in the study, the cooperation among students and parents was encouraging.

4.7 Data entry and Statistical analysis

Statistical Package for Social Sciences Inc, Chicago Illinois (SPSS) version 22 was used for data statistical analysis. Data entry, exploration and cleaning were done. Analysis of socio-demographic was done using descriptive statistics. Categorical variables were expressed using percentage and numerical variables were expressed using mean (standard deviation).

The numerical and categorical variables as listed below;

Socio-demographic data:

i. Age
ii. Gender
iii. Race
iv. Marital status
v. Education level
vi. Employment status
vii. Household income

For objective 1, 2 and 3, descriptive statistic was used to describe proportion of parental knowledge, acceptance and decision-making pattern on HPV vaccination. Parental knowledge was categorized as poor and good. This was done by 1 mark for correct answer and 0 mark for the wrong and do not know (31). Participants were considered as having good knowledge when the score is more than 70% (31).