KNOWLEDGE AND ATTITUDES ON HUMAN PAPILLOMAVIRUS (HPV) INFECTION AND HPV VACCINATION AMONG HEALTH CIINIC NURSES IN THE STATE OF KELANTAN

By

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DEDICATION

This thesis is dedicated to my beloved late husband Kandeepan Vynayagan who never got to read the final draft. You are the determination in every page.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LIST OF ABBREVIATIONS

ANONE	American Organization of Nurse Executives
AIDS	Acquired immune deficiency syndrome
CME	Continuous Medical Education
CDC	Centers for Disease Control
FDA	Food and Drug Administration
HPV	Human Papilloma Virus
HUSM	Hospital University Sains Malaysia
JM	Jururawat Masyarakat
KK	Klinik Kesihatan
MCH	Maternal Child Health
MOH	Ministry of Health
NMRR	National Medical Research Register
OPD	Out Patient Department
STI	Sexually Transmitted Infection
WHO	World Health Organization

ABSTRAK

TAJUK: Pengetahuan dan sikap jangkitan HPV dan vaksinasi HPV di kalangan jururawat pusat kesihatan di negeri Kelantan

PENGENALAN: serviks kanser, walaupun dicegah, masih punca utama kematian kanser di kalangan wanita di Malaysia menengah untuk kanser payudara. Jangkitan berterusan dengan HPV telah sebab dan akibat dikaitkan dengan kanser pangkal rahim. Yang berasaskan sekolah program vaksinasi HPV diperkenalkan pada sokongan lewat 2010. Nurses 'adalah penting bagi kejayaan program ini, bagaimanapun, ia tidak dinilai lagi. Kajian ini bertujuan untuk menentukan faktor-faktor yang berkaitan dengan skor pengetahuan mereka.

KAEDAH: Satu kajian telah dijalankan dari Jun hingga Julai 2014 di Kelantan klinik kesihatan awam. Jururawat dipilih melalui proses persampelan rawak yang berbilang dan soal selidik yang ditadbir sendiri telah diedarkan kepada 347 jururawat. Data dianalisis dengan menggunakan SPSS versi 22. Pelbagai model regresi linear digunakan untuk menentukan pembolehubah yang berkaitan dengan skor pengetahuan jururawat.

KEPUTUSAN: Sebanyak 330 soal selidik yang lengkap telah dianalisis dan menunjukkan bahawa: 32.4% jururawat mengambil bahagian dari unit pesakit luar dan 67.6% daripada unit kesihatan ibu dan kanak-kanak. Rata-rata pengetahuan min (SD) adalah 5.3 (1.7) daripada 11. Hanya, 24% tahu HPV yang seksual virus yang paling biasa diucapkan; 67% tahu bahawa Gardasil melindungi daripada empat jenis HPV dan 29% dengan betul menjawab umur

sasaran vaksinasi. Kelayakan Kejururawatan ($p < 0.001$) hanya faktor yang ketara berkaitan dengan skor pengetahuan. HPV- berkaitan pengalaman kerja, yang mempunyai kanak-kanak dalam kumpulan umur vaksinasi dan membaca sumber-sumber tidak menunjukkan pengaruh dalam skor pengetahuan.

KESIMPULAN: Ini adalah kajian pertama dilakukan di Malaysia untuk menilai pengetahuan jururawat dalam hal ini. Hasil daripada kajian ini menunjukkan jururawat mempunyai sikap yang baik ke arah vaksin HPV, tetapi mereka berada dalam keperluan mendesak untuk meningkatkan pengetahuan HPV- berkaitan dan vaksinasi sebenar. Kajian yang sama perlu dilakukan di negeri-negeri lain, untuk mempunyai anggaran yang luas dan menjadikan program pendidikan berdasarkan negara untuk meningkatkan pengetahuan jururawat dalam perkara ini.

ABSTRACT

TITLE: Knowledge and attitudes on Human Papillomavirus (HPV) infection and HPV vaccination among health clinic nurses in the state of Kelantan

INTRODUCTION: Cervical cancer, though preventable, is still the leading cause of cancer death among women in Malaysia second to breast cancer. Persistent infection with HPV has been causally linked to cervical cancer. The school-based HPV vaccination program was introduced in late 2010. Nurses' support is imperative for the success of this program; however, it has not been assessed yet. This study aims to determine factors associated with their knowledge score.

METHODS: A survey was conducted from June till July 2014 at health clinics in Kelantan. The nurses were selected through the multistage random sampling process, and self-administered questionnaires were distributed to 352 nurses. Data were analyzed using SPSS version 22. Multiple linear regression models were used to determine the variables associated with the nurses' knowledge score.

RESULTS: A total of 330 completed questionnaires were analyzed and showed that: 32.4% nurses participated from the outpatient unit and 67.6% from maternal and child health unit. The mean knowledge score (SD) was 5.3 (1.7) out of 11. Only, 24% knew that HPV is the most common sexually transmitted virus; 67% knew that Gardasil protects against four types of HPV and 29% correctly answered the target age of vaccination. Nursing qualification (p<0.001) was the only factor that significantly associated with knowledge score. HPV-

related work experience, having children in vaccination age group and reading resources showed no influence in knowledge score.

CONCLUSION: This is the first study done in Kelantan to assess nurses' knowledge in this regard. Findings from this study indicate nurses have favorable attitudes toward HPV vaccination, but they are in urgent need of improving HPV- related knowledge and its actual vaccination. Similar studies need to be conducted in other states, to have a broad estimation and to make a nationally based education program to increase nurses' knowledge in this matter.

CHAPTER 1

1.1 INTRODUCTION

Despite cervical cancer is a highly preventable gynecological cancer, it still takes many women's live around the world. According to the Center for Disease control, more than 4000 women die of cervical cancer each year in the United States. An estimated 80% of cervical cancer deaths take place in the developing countries, including Malaysia (1). Cervical cancer is the second most common female cancer among Malaysian women. The number of cervical cancer patients in Malaysia for the year of 2003 was 1557 which accounting for 12.9% of the total female cancers. The age-standardized incidence rate of cervical cancer in Malaysia was 19.7 per 100 000 population(2).

Human papillomavirus (HPV), one of the most common sexually transmitted infection in the world, is related to almost all cervical cancers. Most HPV infection is temporary and resolves without medical treatment. However, persistent infection with a high-risk type of HPV (16, 18, 31, 33, 45, 52 and 58) will lead to cervical cancer. In those, HPV 16 and 18 were implicated as the causative agents in 70% of cases of cervical cancer globally (3,4). In developed countries, Papanicolaou (Pap) smear has been the gold standard method for cervical cancer screening. It has significantly reduced the incidence of cervical cancer in countries where an organized screening program in place (5,6). Whereas Pap smear screening is unsuccessful in developing countries and not ever reached it purpose. Lack of medical facilities, cultural barriers and the unpleasant experience of this test preventing it to consider as an optimal test to reduce cervical cancer incidence in developing countries (7,8,9).

Prevention is better than cure. The newly introduced two HPV vaccines, Gardasil as a quadrivalent vaccine (cover types 6,11,16,18) and the Cervarix as a bivalent vaccine (covers HPV types 16&18) seems to be promising for the prevention of cervical cancer especially in developing countries (8). The vaccine was approved in Malaysia in 2006 and has been offered through a fully funded school-based vaccination program to the girls age 13 years since 2010. Since the arrival of HPV vaccine in Malaysia, there have been many studies conducted to assess public knowledge and attitudes of HPV infection and its vaccine. Most studies have concluded that the overall awareness and knowledge of HPV infection and HPV vaccine among the Malaysian population was low regardless of educational status, economic status and ethnic groups. However, many studies have noted a positive attitude towards the vaccination among their participants, though several barriers are existing on the acceptance of the vaccine. Concern about safety and efficacy of the vaccine and the parental belief of vaccine could predispose their girls in risky sexual behavior were some of the factors that need to be addressed to increase the acceptance of vaccine among Malaysian population (10,11,12).

Healthcare providers are well situated in a position to be in contact point with the target population and their parents. Many studies have confirmed that the health care professionals recommendation are one of the factors that influence patients' and parents' decision about acceptance of vaccine (13, 14,15). In Malaysia, It is the nurses working in the health clinics exclusively run the school-based HPV vaccination program. Therefore, the nurses in health clinics play the key role in promoting HPV vaccination and increasing the vaccine uptake rate among the target population. In that case, isn't it important to assess their knowledge and attitude of HPV infection and its vaccine to affirm that our patients' concerns are being addressed with a positive attitude.

1.2 JUSTIFICATION OF STUDY

Though vaccines have been in use for years, its efficacy and safety are always a concern to the public. There are many unresolved myths and beliefs about vaccines especially one of the belief of autism and its link to MMR vaccine. Without exception, the newly introduced HPV vaccine also faces ample of criticism from anti-vaccine groups and media. It is essential that both the public and the health care providers have to have up to date and evidence-based knowledge to overcome the propaganda towards HPV vaccine.

Health care provider's knowledge and attitudes have an impact on the public acceptability of the vaccine (13, 14, 15). In late 2010, the school-based HPV vaccination program was implemented in Malaysia. Studies conducted to assess public knowledge about HPV infection and HPV vaccination in Malaysia found limited knowledge among participants regardless of their educational, social and ethnical background (10, 11, 12). This low awareness among public could negatively impact the success of the vaccination program. This finding indicates a serious need for education on HPV vaccination to the public. Nurses are the most visible frontline personnel providing health education to patients and the general population (16). To successfully run the HPV vaccination program in Malaysia, it is important that health clinic nurses should have up to date knowledge with a positive attitude towards HPV vaccine. Up to now, there were only a few studies done to access the knowledge on HPV and HPV vaccination among health care providers in this country. Though the public funded vaccination program is exclusively run by health clinic nurses in Malaysia, yet to date limited studies were done to access their knowledge and attitudes of HPV infection and HPV vaccination. Health nurses play the main role to vaccinate the target population through the school-based vaccination program. They are going to be the trustable source of information

about HPV vaccine to the parents and the adolescents. Therefore, assessing their knowledge and attitudes about HPV vaccine is important to achieve the purpose of the school-based vaccination program and to reduce the cervical cancer mortality among our population.

I believe this study will provide valuable information regarding the educational needs of the nurses working in health clinics.

CHAPTER 2: LITERATURE REVIEW

2.1 Overview of cervical cancer and cervical cancer screening method

Worldwide, cervical cancer continues to be the second most common cancer in women after breast cancer (17). There are an estimated 470,000 new cases of cervical cancer that result in 233,000 deaths per year. More than half of the world's total cervical cancer cases (51.6%) and half of the cervical cancer deaths (50.3%) are contributed by the Asia Pacific region (18). According to the 2007 Malaysian National Cancer registry report, cervical cancer is the second most common cancer among Malaysian women and ranked 5th among the entire general population.The incidence of cervical cancer rate is increased with age after 30 years. It had a peak incidence rate at ages 60 - 69 years and declined after that. Compared with the major races in Malaysia, Indian women had the highest incidence of cervical cancer followed by Chinese and Malay (19). Based on the 2010 WHO/ICO (Institut Catala d'Oncologia) summary report, Malaysia has an 8.7 million women aged 15 years and above who are at risk of developing cervical cancer (20). In Kelantan, a state in The East coast of Malaysia where the population is predominantly Malays, cervical cancer is the fifth leading cancer and ranked second after breast cancer among women for the period of 1999-2003. It accounted 10.3% of all female cancers with the age-standardized rate of 7.3 per 100 000 population per year (21).

Until Pap smear was first introduced in the 1940s, cervical cancer was the number one killer of women. The Pap smear, now a standard cancer screening test for all women, has greatly reduced the death rate for cervical cancer in countries which has a systematic screening in place (5). Countries such as Finland, Sweden, Denmark, and Iceland showed nearly 50% drop in cervical cancer mortality since the organized cervical cancer screening programs were established (6). A similar trend was seen In U.S.; the cervical cancer mortality decreased after the implementation of organized cervical cancer screening program in 1960's (22). It is

also true in England and Australia where the cervical cancer incidence dramatically reduced after organized cervical cancer screening method was introduced (5). In contrast, having a structured cervical cancer screening program is the biggest challenge in developing countries which contribute 80% of world cervical cancer incidence. Lack of infrastructure, shortage of technical, medical, and financial resources, lack of awareness and education about cervical cancer among women and health-care providers were some of the limiting factors for successful screening program in resource-poor countries (7). On the other hand, despite its success in cancer screening, Pap cytology has important limitations as a laboratory test. The imperfect sensitivity of cytology testing is estimated to be responsible for 30% of all cervical cancers, and 10% of cervical cancers resulted from providers error in the follow-up of the abnormal result (23). Also, Pap smear test has low impact in detecting cervical adenocarcinoma compare to squamous cell carcinoma of the cervix (24).

In Malaysia, Pap smear test was introduced in 1969. However, there has been no change in the pattern of the prevalence of cervical cancer indicating that the Pap smear coverage has not targeted the population at risk (25). According to a survey done by the ministry of health, cervical smear coverage in Malaysia was 2% in 1992, 3.5% in 1995, and 6.2% in 1996 respectively (26). Lack of medical facilities, low awareness about the cervical cancer screening method, fear of Pap test, bad past experiences, embarrassment, awkward nature of the test, physician gender, insensitivity to patients need, and cultural influences contributed this poor outcome of cervical cancer screening test in developing countries (27). Therefore, an affordable, effective and culturally acceptable approach is needed to reduce cervical cancer prevalence in these countries.

2.2 HPVs and HPV Vaccination

It is a well-known fact that human papillomavirus is the primary etiology of cervical cancer. It is the most common sexually transmitted infections in the world today. Although most people get infected with HPV at some point in their life, most of them do not show any signs or symptoms (28). It is estimated that 20 million Americans become infected each year with HPVs, an anticipated 6.2 million infection annually (29). There have been more than 100 HPV types identified to date; in those HPV types, some infect the cutaneous epithelium and cause common skin warts. About 40 HPV types infected the mucosal epithelium and associated with cervical cancer. High-risk or oncogenic HPV types act as carcinogens in the development of cervical cancer and other anogenital cancers. HPV type 16 is the cause of approximately 50% of cervical cancers while HPV types16 and 18 is implicated as the causative agents in 70 percent of cases of cervical cancer globally (30). Together, HPVs 16, 18, 31, 33, 45, 52 and 58 account for about 90 percent of cases worldwide. While, HPV 6 and 11 are the two types with low oncogenic potential that causes 90 to 100 percent of external anogenital warts and nearly all cases of recurrent respiratory papillomatosis (31). High numbers of sexual partners, sexual intercourse at an early age, and the sexual behaviour of a woman's partner all can increase a woman's risk of exposure to high-risk types of HPV and development of cervical cancer(26). Infection with a high-risk HPV type is considered necessary for the development of cervical cancer (27).

In addition to having HPV infection, smoking, immune-compromised state, HIV infection, having given birth to more than three children and prolong use of oral contraceptive pills can further increase the risk of developing cervical cancer (28,29,31). Because the transmission of HPV infection occurs via skin to skin contact, using condom alone cannot fully prevent this sexually transmitted infection (29).

The prevalence of HPV genotypes differs from region to region. A prospective, multi-centred, hospital-based cross-sectional study conducted across five Asian countries included Malaysia, Vietnam, Singapore, South Korea, and the Philippines reported HPV16 was the most commonly observed HPV type in these countries followed by HPV 18, 52 and 45 (32). HPV 16 and HPV 18 are estimated to account for 88% of cervical carcinoma among Malaysian women (12). Two published large international studies have shown an association between adenocarcinoma and HPV types 16 and 18 (33, 34). The apparent inadequacies in current cervical cancer screening method to detect precursor adenocarcinoma lesions, emphasize that the importance of having HPV vaccines (to HPV 16/18) in addition to getting regular Pap smear screening. Evidence shows HPV vaccine is expected to prevent at least 71% of squamous cell carcinoma of the cervix and 96% of adenocarcinoma of the cervix (35).

The development of highly effective HPV vaccines is thus an important breakthrough as it offers great potential to reduce the incidence of cervical cancer, especially in low-resource countries. In June 2006, the U.S. Food and Drug Administration (FDA) approved the use of the first prophylactic quadrivalent HPV vaccine. This vaccine protects against HPV types 6, 11, 16 and 18 to prevent cervical precancers and cancers and anogenital warts as well as prevention of vulvar and vaginal precancers and cancers in female. Cervarix is bivalent and protects against HPV 16 and 18. Both vaccinations are approved for females ages nine to 26. To be fully vaccinated, three shots of each vaccine is required (36).

The safety and efficacy of vaccines are well established too. Before licensed, Gardasil was studied in more than 29,000 males and females, and the Cervarix vaccine was studied in more than 30,000 females during clinical trials. Both vaccines were found to be safe and effective.

A meta-analysis of seven randomized control study included 44,142 women found that Prophylactic HPV vaccines were safe, well tolerated, and highly efficacious in preventing persistent infections and cervical diseases (37). Since the vaccines were licensed, no serious safety concerns have been identified (38). Also, U.S. national post-licensure vaccine safety monitoring data from 2006 till 2012 continue to indicate that Gardasil is safe (39). Efficacy against infection and cervical lesions associated with HPV-16/18 has been shown up to 8.4 and five years with the bivalent and quadrivalent vaccine respectively. Further studies and continuous monitoring required for the long-term outcome (40).

On 29th of June 2006, US Centres for Disease Control and Prevention (CDC) Advisory Committee on Immunization Practices (ACIP) voted to recommend Gardasil to be routinely given to girls 11 to 12 years of age. It can also be given to girls at the age of 9. Studies suggest that vaccine protection is long lasting. Available evidence indicates protection for at least 8 to 10 years, and there has been no evidence of waning immunity (41). Also, titers are twice as high when a child is vaccinated at 11 to 12 years of age compared with vaccination at 15 years of age (42). Multiple cohort studies are in progress to monitor the duration of immunity. The new 9-valent vaccine against human papillomavirus, known as Gardasil 9 (6, 11, 16, 18, 31, 33, 45, 52, and 58), has been recently approved in U.S. It is not yet in use for other countries.

Currently, Gardasil and Cervarix are available in more than 100 countries, and Malaysia was one of the Asia Pacific countries that licensed the administration of HPV vaccine. Malaysian's drug authority approved the Quadrivalent Vaccine on 20th October 2006. In Malaysia, all vaccines provided in schools are fully funded by the public health program of the State. The vaccines that are delivered as part of the comprehensive school-based vaccination program are tetanus-diphtheria, and acellular pertussis booster, as well as a catch-

up program for the vaccine. In 2010, HPV vaccine was added to the school-based vaccination program. Trained primary care nurses offer these vaccines in all public and independent schools through the entire country free of cost for the form 1 students (age 13). Parental consent is received prior to giving the vaccines. Children who are absent to the school that day can receive the vaccines on a day when the school nurses are visiting other classes (43).

2.2.1 HPV Knowledge

Success in controlling cervical cancer will only be achieved if the vaccine has good uptake. At the same time, uptake of HPV vaccine strongly depends on its acceptability.

Wong and Sam (2010), found knowledge about HPV, prevention of cervical cancer and the risk associated with cervical cancer were significantly associated with the intention to receive the vaccine (11). Similarly, Kang and Kim (2011) in their cross-sectional study among 297 female undergraduate students in Korea found that the intention to receive vaccination among participants was highly associated with wanting more education about the vaccine, disease severity, knowledge of human papillomavirus and awareness of the human papillomavirus vaccine (44).

Since HPV vaccine has been introduced, there have been many studies conducted to explore public's knowledge on HPV and HPV vaccine. Most studies indicated that public have little knowledge about this infection. The knowledge is equally low in either developed or developing countries (3, 45).

Studies carried out among various population in the U.S such as adolescents, college students, and Hispanic population showed low knowledge about HPV infection among public (46,47,48). A systemic review done by Klug et al using pub med search included 39 article

published from 1992 till 2006 again confirmed that knowledge about HPV vaccine and infection was poor among the public, parents and students in the U.S.(45).

A study done recently by the colleges in the United Kingdom, reported a low awareness and knowledge about HPV and HPV vaccination in a cohort of girls that were offered the vaccination through a school-based vaccination program (49).

Australia commenced a government funded national HPV vaccination program in 2007 (50). Girls 12-17-year-old who still in school were get vaccinated through the school-based vaccination program. The awareness of HPV infection and HPV vaccination was considerably poor in the early years of introduction of the vaccine (51,52). However, studies done in recent years showed a slight increase in awareness among Australian compare to the early years.

Korean author Oh, Hyunjin did an extensive literature review using 17 studies, published from 2006 through 2011 in the Asian countries. The review showed a lack of basic knowledge of HPV infection and vaccination among public in countries such as Hong Kong, Malaysia, China, India, Korea, Taiwan, and Thailand. In 6 studies, less than 50% of people aware HPV is the causative agent for cervical cancer and 70% of the participants unaware that HPV is transmitted through sexual activity (3).

Studies conducted in Malaysia has also shown similar results. Khoo et al., in their study, have explored awareness of HPV vaccination among villagers in rural Penang. Out of 116 participants, only 29.3% had heard about HPV infection and 42.2% of them had heard of HPV vaccination respectively (10). The outcome of this study was not a surprise. As villagers with a low socio-economic background and have limited access to the media, a newly introduced vaccine in the country would not have influenced within a short period. Time

should be the limiting factor for the low awareness of HPV because the participants showed higher awareness of cervical cancer (88.8%).

Al-Dubai et al., conducted a study of HPV knowledge and attitude among young Malaysian woman attending in the obstetrics and gynecology outpatient clinic in a selected hospital in Bangi Selangor. He found only 26% of participants had heard of HPV virus, and only 21.7% had heard of HPV vaccine (1).

A cross-sectional survey conducted among 650 ethnically, religiously and educationally diverse female university students in Kuala Lumpur showed remarkably poor knowledge regarding HPV and HPV vaccination among students. The participants' mean knowledge score was only 3.25 out of 14 (SD. 2.4). On those participants, 10.3% have heard of the newly released HPV vaccine 72.8% were not aware that HPV causes cervical cancer and 90% incorrectly answered the mode of transmission of HPV (11).

In 2011, a similar study was conducted among 826 students studying in Universiti Kebangsaan Malaysia, again confirmed the low level of awareness and misconception regarding HPV infection and HPV vaccination among teenage university students (54). These studies indicate relatively low knowledge about HPV infection and HPV vaccination among Malaysian population regardless of their educational, economic and ethnic background.

2.2.2 Primary care provider's knowledge of HPV infection and its vaccine

Olgive et al., conducted one of the first population-based assessments of factors associated with HPV vaccine uptake in a publicly funded school-based program. In his study, he found that even though the school-based vaccination program providing vaccine free of charge,

parents, the key decision makers, were still hesitant to have their daughters receive the HPV vaccine. The study found that one of the main reasons for parental acceptance of the HPV vaccine was physician recommendation. Whereas the reasons for denial of vaccine were concern about vaccine safety (29.2%), age of vaccination (15.6%) and the lack of information about the vaccine to make an informed decision (12.6%) (15).

Dempsey et al. interviewed 52 mothers of vaccinated and unvaccinated 11- to 17-year-old girls seen during preventive care visits in outpatient family medicine and pediatric clinics. He identified several unique factors underlying mothers' decisions about HPV vaccination. Lack of knowledge about HPV, age-related concerns, and low perceived risk of infection were commonly stated reasons for declining vaccination. The desire to prevent illness, physician recommendation, and a high perceived risk of infection were commonly reported motivating factors. Both groups of mothers had significant concerns about vaccine safety. He concluded that addressing safety concerns, educating parents about the age-specific risk of HPV infection, and promoting strong physician recommendation for vaccination to increase HPV vaccine utilization (55).

For an immunization delivery system to be effective, it must address the needs of both the target populations and the providers. Primary care providers (pediatrician and obstetric gynecologist and family physician), aside from the nurses are frontline personnel who could influence parents and adolescent girls in their intent for vaccination, provide information and offer advice. To have an effective communication with their patient their knowledge should be adequate and up to date.

There are few studies done in western countries showed primary care providers knowledge and attitudes towards HPV and HPV vaccination were adequate, and they also have a positive attitude towards the vaccine (56,57). Whereas studies done in Asian countries showed low

knowledge among health care providers though have a positive attitude towards vaccine acceptance (58,59,60).

Similar results were observed when knowledge was assessed on health care nurses in developing countries (16, 60, 61). Nganwai et al., explored the knowledge of registered nurses in Thailand via a cross sectional study. He assessed knowledge regarding cervical cancer and its prevention, and knowledge on HPV infection. He found that nurses had a moderate level of knowledge regarding cervical cancer and HPV infection. Among the participants, only 60.9% knew that almost all cervical cancer patients have HPV infection (16). Another cross-sectional study conducted in Thailand by Songthap et al. also reported low knowledge score among nurses. The mean knowledge score of 200 nurses were 5.45 out of 11 item knowledge questions (59).

A study among conducted among nurses in Iran showed similar results. A questionnaire completed by 357 female nurses; Only one hundred and thirty-one of the nurses (36.7%) knew about HPV infection and how it can cause abnormal Pap Smear results. About 130 (36.5%) of them were aware that It is possible for the infected person to have no sign or symptoms. While 208 (58.3%) nurses knew that HPV could be transmitted by sexual intercourse, whereas only 40 (11.2%) were aware that it could be passed on by skin-to-skin contact (61).

Duval et al. (2009) assessed Canadian nurses' knowledge, attitudes, and information needs as well as factors associated with willingness to recommend vaccination. This study found that most nurses supported HPV vaccination but recommended targeted educational efforts to ensure nurses' involvement to successfully implementing a new vaccination program (62).

Additionally, a cross-sectional study done to assess knowledge and stigmatizing attitudes related to human papillomavirus (HPV) and HPV testing among Chinese healthcare providers in Hong Kong, indicated a need for continuous education on HPV and HPV testing. In that study, many participants incorrectly answered 6 of 7 knowledge items regarding HPV testing. This study also found a good knowledge was associated with less stigmatization attitude. Therefore, healthcare providers should have good knowledge and attitude about HPV vaccine to successfully implement HPV vaccination program (63).

2.3 Attitudes towards HPV vaccination

An attitude is a favorable or unfavorable reaction toward obtaining a vaccine or Pap smear (64). Studies have reported significant associations between cervical cancer prevention measures and attitudinal related-factors. When it comes to Pap smear test pain, provider gender and discomfort are the determining factors for the attitude towards the test (65). HPV vaccine is relatively new to the public. The concern about safety, efficacy, cost, some religious and cultural aspect (whether vaccine halal or not) also have an impact on someone's attitude toward vaccine (12). Unlike personality, attitude can be changed through persuasion. A systemic review done by Brewer et al., included 28 studies published from 1995 through 2007, reported physician recommendation about the vaccine was a factor in determining patient attitude toward the acceptance of vaccine (66). Some of the factors that driving health care providers intention to recommend HPV vaccines were knowledge, personal and professional characteristics, vaccine cost and reimbursement, parental factors and specific attitudes about HPV vaccines, female gender, having an exclusively outpatient practice, being involved in teaching medical students or residents, and practicing in a family practice setting (67, 68).

Many studies have reported there was hesitancy among health care providers to initiate a talk about sexually transmitted infection with their young patients, regardless of the country of practice (67, 69). This would be the biggest drawback in promoting the vaccine among the target groups. Compare to other vaccine, most parents have concern, hesitation, and fear that having HPV vaccination in early age could encourage sexual activity or unsafe sex among their children. Bednarczyk et al. has addressed this issue first time and conducted a retrospective cohort study utilizing longitudinal electronic data from a large managed care organization. Total of 1398 girls included 493 HPV Vaccine-exposed and 905 HPV vaccine-unexposed from age 11-22 years enrolled in this managed care organization was followed up for three years. The risk of the composite outcome such as any pregnancy/sexually transmitted infection testing or diagnosis or contraceptive counseling was not significantly elevated in HPV vaccine-exposed girls compares to HPV vaccine-unexposed girls. A similar finding was also reported by Sternberg et al. The study showed vaccinated women were more health conscious than unvaccinated women. They had regular Pap smear screening, consistent condom use and family planning than unvaccinated women. (71). Therefore, Healthcare providers' should address these issues based on recent evidence and should approach sexual counseling with teenagers or parents without hesitancy.

A study conducted among female nursing students of a university in Hong Kong showed concerns about possible side effects and issues of safety and efficacy as potential barriers for vaccination. High cost of HPV vaccine, the participants' perception of HPV as not being a risk and the inconvenience of having to receive three shots over a six-month period were also identified as reasons for unwilling to be vaccinated. However, these nursing students not agreed that vaccine going to increase the risky sexual behavior among adolescents. They were

well aware of the risk of getting other possible sexually transmitted infection with unprotected sex (72).

In contrast Nganwai et al in his study reported that only 1.5% of his study participants highly disagreed with "HPV vaccine could have a socio-cultural impact upon increasing multiple sexual partner behaviour among adolescents" (16).

In a study conducted among university students in Malaysia, only 10.3% had heard of HPV vaccine. 48% of participants in this study had intentions to receive the vaccine. The other half were mostly concerned about safety and efficacy (50.9%). Some did not think they had any risk of receiving HPV (41.5%) and some (11.3%) embarrassed to receive an STI vaccine(11).

Another Malaysian study showed that 77.7% of the secondary school students were undecided or unwilling to take the vaccine due to safety concern (73).

Therefore, a frontline health care personal with a positive attitude towards HPV vaccine is imperative to eliminate the negative attitude of HPV vaccination among the Malaysian population.

2.4 Correlation between knowledge and attitude

Knowledge is a necessary component of behavior change, though, on its own, it is not sufficient to bring about behavior change. A study conducted by Lichet et al. showed a positive association between knowledge about HPV and the HPV vaccine intake (74). Whereas a study conducted among nurses in Iran showed a low knowledge in HPV predisposed to a negative attitude toward vaccination (61). Similarly, a Sweden study among nurses showed statistically significant differences in attitudes of HPV vaccination in perceived knowledge about HPV vaccination ($p < 0.001$) compare to education received

about HPV vaccination ($p < 0.001$). The study concluded, nurses were more likely to have a positive attitude towards vaccination if they had more knowledge and education about vaccination (75).

Gerend and shepherd were tried to identify correlates of HPV knowledge in their study. 735 female student age18-26 years who had never received any HPV shots were recruited. Pearson Moment Correlation was calculated to estimate the relationship between two continuous variable and Point-Biserial correlations were calculated to estimate the relationship between dichotomous variable. A positive correlation was observed between HPV knowledge and provider's recommendation for HPV vaccination. Women with more years of education, older women and women currently in a romantic relationship and women with a higher number of lifetime sexual partners. Study participants who oppose to premarital sex the knowledge score was negatively correlated (76).

Yanikkerem and Koker reported an interesting finding in their study conducted among nurses in Turkey. This study was performed with nurses who had girls between 9 and 26 years of age for evaluating the behavior of vaccination after received three months of HPV education. There was a significant improvement noted participants knowledge score after the intervention. However, out of 105 participants only two nurses has vaccinated their daughter after the educational intervention (77).

2.5 Factors associated with HPV knowledge

Only a few studies have analyzed factors associated with HPV knowledge score. Anna et al. have explored the factors that influence knowledge scores among women in African-American population in Chicago. She found that knowledge among this population was remarkably low. The adequate knowledge score was influenced by participants' education

level, household income, marital status and having a child who had been offered the HPV vaccine. Having had a Pap test or having seen a doctor within the past year was not significantly influenced adequate knowledge scores (78).

Whereas Nganwai et al., reported a contrasting finding in his study. He could not explore any association between knowledge score with marital status or level of education. However, he found there was a significant inverse association between age and knowledge ($p<0.05$), among his participants. Also, he found that having a female personal doctor had positively associated with his study participants knowledge score (16).

Gerend and Shepherd found in his study among young women attending Florida University, variables that were significantly positively associated with knowledge of participants were older age, education level, having a Pap smear earlier, Marital status, romantic relationship status, , number of lifetime partners, history of cervical dysplasia and having had HPV vaccine. Whereas, premarital sex value negatively associated with knowledge of study participants (76).

A study from the United States showed factors that positively associated with HPV awareness were younger age, being non–HispanicWhite, getting regular Pap tests, higher educational attainment, exposure to more than one source of health information, and being aware of the change in screening guidelines(79).

One study found that factors influence health care providers knowledge were associated with years of practice, proportion of female patients, provider subspecialty status, and practicing in a hospital setting, vaccine safety/efficacy, higher HPV awareness, adherence to local guideline, ethnicity, education level, income level, family history of cancer (71).

Study among nurses in Turkey showed no statistically significant relationship between the nurses' knowledge of HPV and the demographic characteristics such as nurses' age, duration

of working time, marital status, parity, income level, number of children and the gender of children. However, the study found that knowledge of HPV infection score was significantly higher in nurses with higher education (77).

Caron et al., revealed her study sample of 361 female college students from Northeastern University in New Hampshire, the source of information they mostly used to know about the HPV-related information. They were “Tell Someone” television commercial (64.9%) and the “One Less” television commercial (64.5%), both of which were developed by Merck Pharmaceuticals, Inc. Friends (41.8%) and family (31.9%) were the next most common sources for her participants received information regarding the HPV vaccination (80).

The resources nursing students from Turkey used to obtain HPV-related information were the internet(27.2%), friends (27.2%), media (22.0%) and health professionals (17.5%) respectively (81). Their level of awareness of HPV was 88.1%; 46% has known HPV infection is a sexually transmitted disease, and 70% knew its link to cervical cancer (81).

CHAPTER 3: OBJECTIVES

3.1 Research Question

1. What is the HPV-related mean knowledge score of nurses working at health clinics?

2. What is the HPV-related mean attitudes score of nurses working at health clinics?

3. Is there a correlation between nurses HPV-related knowledge score and their HPV related attitudes score?

4. What are the factors associated with nurses HPV-related knowledge score?

3.2 General Objectives

To determine the knowledge and attitudes of HPV infection and HPV vaccination among nurses working in health clinics in the state of Kelantan.

3.3 Specific Objectives

1. To determine the mean knowledge score of HPV infection and HPV vaccination among nurses.

2. To determine the mean attitudes score of HPV infection and HPV vaccination among nurses.

3. To correlate the nurses' knowledge score and attitudes score of HPV infection and HPV vaccination

4. To determine the factors {Age, Family income, Work experience, Race, Marital status, Having children in age group 13-26, Having HPV vaccinated daughters, Working unit,

Nursing qualification, Involved in HPV vaccination school team, Attended HPV conference and source of HPV information update} associated with nurses' HPV infection and HPV vaccination knowledge score.

3.4 Research Hypothesis

1. H_A: There is a correlation between nurses knowledge score of HPV infection and HPV vaccination and nurses' attitudes score of HPV infection and HPV vaccination

   H0 There is no correlation between nurses' knowledge score of HPV infection and HPV vaccination and nurses' attitudes score of HPV infection and HPV vaccination.

2. H_A: Socio-demographic, work related and HPV information related factors are significantly associated with nurses HPV infection and HPV vaccination knowledge score.

   H0: Socio-demographic, work related and HPV information related factors are not significantly associated with nurses HPV infection and HPV vaccination knowledge score.

3.5 Operational Definition

Knowledge of HPV infection and HPV vaccination: The understanding that the participants have about HPV infection and its vaccination respects to symptoms, risk factors, treatment, and vaccine schedule and target group.

The attitude of HPV infection and HPV vaccination: The belief and feeling of the respondents about HPV vaccination and HPV infection.

Health clinics: Government funded primary care clinics in Kelantan.

Staff Nurses: Nurses who have completed 3-4 years of nursing course and held a diploma or degree in nursing.

JM: Community nurses (jururawat masyarakat) who have completed less than three years of nursing course and held a nursing certificate.

OPD: Out Patient Department

MCH: Maternal Child Health Unit

Overall knowledge score: Overall knowledge score is the average of the scores from each of the knowledge statements used.

Overall attitude score: Overall attitude score is the average of the scores from each of the attitude statements used.

Favourable attitude: Nurses positive assessment towards HPV vaccine

Gardasil® : A quadrivalent human papilloma virus (HPV) (types 6, 11, 16, 18) recombinant vaccine.

Cervarix® : A bivalent HPV (types 16, 18) recombinant vaccine .

CHAPTER 4: METHODOLOGY

4.1. Study Design

A cross-sectional study was conducted among nurses working at health clinics from mid-June till the end of July 2014.

4.2. Study Location

This study was designed to conduct in health clinics located in the state of Kelantan. Kelantan, a state of Malaysia, is positioned in the North-east of Peninsular Malaysia. The state consists of 10 districts. They are Kota Bharu the capital city of Kelantan, Gua Musang, Tumpat, Bachok, Pasir Mas, Jeli, Tanah Merah, Machang, Pair Puteh and Kuala Krai. In each district, there are 12, 5, 5, 6, 7, 3, 4, 5, 5, and four health clinics respectively. The total number of nurses working in those health clinics is 958. In those 958 nurses, 449 of them are staff nurses and 509 are jururawat Masyarakat (JM).

4.3. Population and sample

4.3.1 Reference Population

Nurses work at health clinics (Klinik Kesihatan) in the state of Kelantan

4.3.2 Source population

Nurses work at health clinics in the state of Kelantan.

4.3.3 Sampling Frame

Nurses work at selected health clinics in Kelantan who fulfilled inclusion and exclusion criteria. The following inclusion and exclusion criteria were applied in this study;