

EFFECTIVENESS OF HEALTH TALK EDUCATION
PROGRAM ON HPV (HUMAN
PAPILLOMAVIRUS) KNOWLEDGE, PERCEPTION
AND CHILDREN VACCINATION INTENTION
AMONG MOTHERS OF SECONDARY SCHOOL
BOYS IN HUE PROVINCE VIETNAM :
A QUASI-EXPERIMENTAL STUDY

Mr. Nguyen Minh Duc

A Dissertation Submitted in Partial Fulfillment of the
requirements
For the Degree of Doctor of Philosophy in Public Health
Common Course
COLLEGE OF PUBLIC HEALTH SCIENCES
Academic Year 2019
Copyright of Chulalongkorn University

ประสิทธิผลของโปรแกรมการพูดคุยเชิงสุขภาพ ต่อความรู้ ความเข้าใจ
และความตั้งใจในการรับวัคซีนเอชพีวีของบุตร
ในมารดานักเรียนชายระดับมัธยมศึกษา จังหวัดเว้ ประเทศเวียดนาม :
การศึกษากึ่งทดลอง

นาย เหงียน มิน ดัก

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุข
สุขศาสตร์ดุษฎีบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์ไม่สังกัดภาควิชา/เทียบเท่า
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2562
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title: EFFECTIVENESS OF HEALTH TALK EDUCATION PROGRAM ON HPV (HUMAN PAPILLOMAVIRUS) KNOWLEDGE, PERCEPTION AND CHILDREN VACCINATION INTENTION AMONG MOTHERS OF SECONDARY SCHOOL BOYS IN HUE PROVINCE VIETNAM: A QUASI-EXPERIMENTAL STUDY

By: Mr. Nguyen Minh Duc

Field of study: Public Health

Thesis Advisor: Assistant Professor Nutta Taneepanichskul, Ph.D.

Accepted by the College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Doctoral Degree in Public Health

..... Dean of the College of Public Health Sciences
(Professor Sathirakorn Pongpanich, Ph.D.)

Dissertation Committee:

..... Chairman
(Professor Surasak Thapanichskul, M.D.)

..... Thesis Advisor
(Assistant Professor Nutta Taneepanichskul, Ph.D.)

..... Examiner
(Montakarn Chuemchit, Ph.D.)

..... Examiner
(Wandee Sirichokchatchawan, Ph.D.)

..... External Examiner
(Associate Professor Manopchai Thamkhantho)

เหงียน มิน ตี้ก : ประสิทธิภาพของโปรแกรมการพูดคุยเชิงสุขภาพ ต่อความรู้ ความเข้าใจ และความตั้งใจในการรับวัคซีนเอชพีวีของบุตร ในมารดานักเรียนชายระดับมัธยมศึกษา จังหวัดเว้ ประเทศเวียดนาม : การศึกษากึ่งทดลอง (EFFECTIVENESS OF HEALTH TALK EDUCATION PROGRAM ON HPV (HUMAN PAPILLOMAVIRUS) KNOWLEDGE, PERCEPTION AND CHILDREN VACCINATION INTENTION AMONG MOTHERS OF SECONDARY SCHOOL BOYS IN HUE PROVINCE VIETNAM: A QUASI-EXPERIMENTAL STUDY). อ.ที่ปรึกษาหลัก ผศ.ดร.ณัฐธา ฐานิพานิชสกุล.

ความเป็นมา : ในสถานการณ์เกิดโรคมะเร็ง ซึ่งเกี่ยวข้องกับมาจากการติดเชื้อเอชพีวีเพิ่มสูงขึ้นทั่วโลก ปัจจุบันในเด็กผู้ชายจะไม่ได้รับวัคซีนป้องกันเหมือนกับเด็กผู้หญิงซึ่งพบว่ามีงานวิจัยน้อยมากเกี่ยวกับการให้วัคซีนเอชพีวีแก่เด็กผู้ชายในหมู่ประเทศแถบเอเชียซึ่งผู้ปกครองของเด็กเหล่านี้มีส่วนช่วยอย่างมากในการตัดสินใจที่จะได้รับวัคซีน งานวิจัยของเราจะประเมินค่าผลการเข้าร่วมจากการเข้าร่วมโครงการสัมมนา ที่เกี่ยวกับความรู้ในเรื่องของโรคติดต่อทางเพศสัมพันธ์หรือเอชพีวี รวมถึงทัศนคติและความประสงค์ต่อการรับวัคซีนของแม่เด็กวัยมัธยมในจังหวัด Thua Thien Hue ของเวียดนาม

ขั้นตอนการศึกษากึ่งทดลอง : การวิจัยนี้เป็นการวิจัยแบบกึ่งทดลองจากการสุ่มตัวอย่างแบบเจาะจง ที่เริ่มทดลองตั้งแต่เดือนกันยายน 2019 ถึงเดือนมกราคม 2020 โดยมีแม่ของเด็กชายจำนวน 288 คนในจังหวัด Thua Thien Hue ของเวียดนาม ที่เป็นผู้ถูกเลือกให้เข้าร่วมงานวิจัยในการวิจัยจะแบ่งผู้เข้าร่วมออกเป็นสองกลุ่ม โดยจำนวน 144 คนจะอยู่ในกลุ่มควบคุมและอีกจำนวน 144 คนจะถูกจัดอยู่ในกลุ่มแทรกแซง โดยกลุ่มแทรกแซงจะถูกเชิญให้มาสัมภาษณ์และตอบคำถามเกี่ยวกับข้อมูลประชากร ประวัติสุขภาพ ความรู้ ความตั้งใจ และความคิดเห็นที่มีต่อโรคติดต่อทางเพศสัมพันธ์หรือเอชพีวี

ผลจากการศึกษา: พบว่าพบว่ามีจำนวน 279 คน จากกลุ่มจากกลุ่มผู้เข้าร่วมทดสอบและสัมภาษณ์ทั้งหมด โดยแรกเริ่มของโดยแรกเริ่มของการทดสอบทั้งสองกลุ่มมีความรู้เรื่องเอชพีวีในระดับเดียวกัน แต่หลังจากผ่านไปหนึ่งเดือน กลุ่มที่เข้าร่วมสัมมนาความรู้เรื่องเอชพีวี มีความรู้เพิ่มขึ้นจากเดิมเป็นอย่างมากเมื่อเทียบกับกลุ่มที่ไม่ได้เข้าร่วมสัมมนาและนอกจากนี้ยังพบว่าในกลุ่มแทรกแซงมีความต้องการให้บุตรชายได้รับวัคซีนมากกว่ากลุ่มควบคุมอีกด้วย. หลังจากการทดลองผ่านไปอีกสามเดือน พบว่าการวิจัยให้ผลลัพธ์เหมือนช่วงเดือนแรก

จึงสามารถสรุปได้ว่า จากการศึกษาด้านสุขภาพจัดว่าเป็นสิ่งสำคัญในการเพิ่มความรู้และความตั้งใจที่จะให้บุตรชายได้รับวัคซีนเอชพีวีในเวียดนาม

สาขาวิชา สาธารณสุขศาสตร์

ลายมือชื่อนิสิต.....

ปีการศึกษา 2562

ลายมือชื่อ

อที่ปรึกษาหลัก.....

6079170853: MAJOR PUBLIC HEALTH

KEYWORDS: HEALTH TALK EDUCATION, HUMAN PAPILLOMAVIRUS (HPV) VACCINATION, PERCEPTION, INTENTION, VIETNAM

Nguyen Minh Duc: EFFECTIVENESS OF HEALTH TALK EDUCATION PROGRAM ON HPV (HUMAN PAPILLOMAVIRUS) KNOWLEDGE, PERCEPTION AND CHILDREN VACCINATION INTENTION AMONG MOTHERS OF SECONDARY SCHOOL BOYS IN HUE PROVINCE VIETNAM: A QUASI-EXPERIMENTAL STUDY. Advisor: Asst. Prof. Nutta Taneepanichskul, Ph.D.

Background: The incidence of cancer related to human papillomavirus (HPV) that affects males is rising throughout the world. Currently, Vietnamese boys are typically not vaccinated against HPV while girls are. There are only a few studies pertaining to HPV vaccination among boys in Asian countries where parents play the most important role in deciding on such vaccination. We present here the first study to assess the effectiveness of a health talk education program on HPV knowledge, attitudes and intention to vaccinate children among mothers of secondary school students in the Thua Thien Hue province, Vietnam.

Methods: This was a quasi-experimental study. Two secondary schools in the Thua Thien Hue province, Vietnam were selected by purposive sampling. A total of 288 mothers of male students of two secondary schools were selected to participate, n=144 as controls and n=144 for the intervention arm for every school. Mothers of male students were invited to answer interview questions. The questionnaires covered social demographics, health history, HPV knowledge and HPV vaccination perception and intention. The study ran from September 2019 to January 2020.

Results: In total, 279 mothers finished the questionnaires. At the baseline, HPV knowledge in both groups was at the same level ($p > 0.05$). One month after receiving the HPV health talk education, mothers of male students had much higher HPV knowledge than those who did not receive such HPV health talk education. The intervention group also had a much higher HPV vaccination intention than the control group ($p < 0.05$). Three months after first intervention have the similar result .

Conclusion: Health education was shown in this study to be an effective method to increase HPV knowledge and vaccination intention among mothers of boys in Vietnam.

Field of Study: Public Health
Academic Year: 2019

Student's Signature.....
Advisor's Signature.....

ACKNOWLEDGEMENTS

I wish to first express my sincere gratefulness to my advisor Asst. Prof. Nutta Taneepanichskul, Ph.D for their valuable time, support and advice in conducting the research. I also appreciate their ability and willingness to work together. In addition, I also wish to thank my dissertation committee members.

I am grateful to my participants who contributed to this study with their time, sharing experiences and commitment in participation to provide me with valuable data.

My special thanks go to my colleagues and friends who encouraged and help me during the time in Thailand.

I wish to acknowledge the research grant from the Office of Higher Education Commission and the Graduate School, Chulalongkorn University for financial support.

I wish to thank the staff and lecturers at the College of Public Health Sciences, Chulalongkorn University, my doctoral classmates who shared experiences and gave me support throughout both the good and difficult times and were always available for me whenever I needed help.

Lastly, my greatest special thanks to my family members for his love, financial support, and encouragement throughout this difficult time.

TABLE OF CONTENTS

ABSTRACT	iv
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xii
LIST OF ABBREVIATIONS	xiii
CHAPTER I INTRODUCTION	1
1.1 Background and Rationale	1
1.2 Research questions	5
1.3 Hypothesis	5
1.4 Objective	5
1.5 Conceptual Framework	6
1.6 Operational Definition	6
CHAPTER II LITERATURE REVIEW	1
2.1 HPV and Cancer	2
2.2 Perceive HPV knowledge	6
2.3 Perceived HPV vaccine safety and efficacy	7
2.4 Perceive vaccine accessibility	8
2.5 Family Structure and Roles in Vietnam	9
2.6 Behavioral change interventions	10
2.7 Parents HPV education Intervention	10
2.8 Research article:	12
2.9 Summary	19

CHAPTER III RESEARCH METHODOLOGY.....	20
3.1 Study design.....	20
3.2. Study area.....	20
3.3 Study population.....	21
3.4 Sample size.....	22
3.5 Sampling technique.....	23
3.6 Data collection.....	26
3.7 Measurement tools.....	29
3.8 Study intervention.....	35
3.9 Data Analysis.....	38
3.10 Ethical consideration.....	40
3.11 Benefits.....	41
3.12 Limitation.....	41
CHAPTER IV RESULTS.....	42
4.1 Social Demographic.....	42
4.2 Awareness and Attitudes at Baseline.....	44
4.3 HPV knowledge.....	45
4.4 Attitudes towards Benefit and Barriers of HPV Vaccine.....	46
4.5 Perceive threat of HPV infection.....	48
4.6 Perceive severity of HPV infection.....	49
4.7 HPV vaccination intention.....	50
4.8 HPV knowledge at the second follow up.....	54

4.9 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)	55
4.10 Perceive threat of HPV infection	56
4.11 Perceive severity of HPV infection.....	57
4.12 HPV vaccination intention	58
CHAPTER V DISCUSSION	61
5.1 Discussion	61
5.2 Recommendations.....	64
5.3 Conclusion.....	66
REFERENCE.....	67
APPENDIX.....	81
APPENDIX A Study timeline.....	82
APPENDIX B Advertisement	83
APPENDIX C Study budget	84
APPENDIX D Questionnaires	86
APPENDIX E Intervention Content	92
APPENDIX F Research Participant Information Sheet and Consent Form	Error!
Bookmark not defined.	
VITA.....	107

LIST OF TABLES

	Page
Table 1 Nuber of HPV-Associated and HPV-Attributable Cancer Cases per Year.....	3
Table 2 Annual rates of HPV DNA found in cancer for each anatomical site HPV DNA 978 prevalence among cases of cancer	4
Table 3 Sample Characteristics	43
Table 4 General HPV knowledge at Baseline.....	44
Table 5 Baseline HPV knowledge between control and intervention group.....	45
Table 6 Median score of HPV knowledge between control and intervention group after receiving education	46
Table 7 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)	46
Table 8 Perceive threat of HPV infection	48
Table 9 Perceive severity of HPV infection.....	49
Table 10 vaccination intention	50
Table 11 Effect of knowledge to HPV vaccination intention between intervention and control group (Yes).....	50
Table 12 Effect of perception of barrier and benefit to HPV vaccination intention between intervention and control group (Yes)	51
Table 13 Effect of perceive threat to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination	52
Table 14 Effect of perceive severity to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination.....	53

	Page
Table 15 Median score of HPV knowledge between control and intervention group	54
Table 16 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)	55
Table 17 Agreement of perceive threat of HPV between control and intervention group (mean)	56
Table 18 Agreement of perceive severity of HPV between control and intervention group (mean)	57
Table 19 HPV vaccination intention	58
Table 20 Effect of knowledge to HPV vaccination intention between intervention and control group(Yes).....	58
Table 21 Effect of perception of barrier and benefit to HPV vaccination intention between intervention and control group (Yes).....	59
Table 22 Effect of perceive threat to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination	59
Table 23 Effect of perceive severity to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination.....	60

LIST OF FIGURES

Figure 1 Conceptual Framework.....	6
Figure 2 Study area map	21
Figure 3 Flow chart of Participant Recruitment.....	26
Figure 4 Description of Health Belief Model Constructs.....	32
Figure 5 Major constructs of the Health Belief Model.....	33

LIST OF ABBREVIATIONS

CDC Center for Disease Control and Prevention

HPV Human Papillomavirus

WHO World Health Organization

CHAPTER I

INTRODUCTION

1.1 Background and Rationale

HPV is human papillomavirus was discovered in 1980 by Harold (Nobel Laureate, 2008). During the past decade, studies have shown a strong link between the human papillomavirus (HPV) and various cancers of the cervix, anus, oropharynx and skin (Smith, 1998; Bosch, Munoz, 2002; Spano, 2005). Human can be infected HPV approximately 75% during of the lifetime (Who, 2002).

There are more than 200 types of HPV, but only a few of them characterized as “high risk” types that can cause cancer. In particular, HPV types 16 and 18 are related to some types of cancer.

HPV type 16 stand for 22.5% of all HPV infections on worldwide (Bruni, 2010). Furthermore, HPV type 6 and HPV type 11 are cause more than 85% of genital warts (Garland, 2009).

Recently ,many epidemiological research on HPV have expanded to men and this being rising incidence of non-cervical HPV infection associated cancers (Giuliano ,2011; Pickard, 2012).In many research ,the prevalence of HPV in men from 18 to 70 was found about 50% (Giuliano ,2011 ;Lee ,2015;Villa 2005).Moreover the prevalence of oral HPV infection was found to 6.9% in many cross-sectional studies of boys and girls from 14 to 19 years old in United States(Gillison ,2012).And prevalence of oral HPV infection in males was much higher than females (10.1% compare to 3.6%).Likewise ,oral HPV infection ia strongly associated with liftetime and number partners of vaginal and oral sex (Gillison, 2012).

These numbers cervical cancer cases may be grossly understated due to the lack of a comprehensive national cancer registries and reporting systems, more than 500,000 cases of cervical cancer and almost 300,000 related deaths

occur annually, most (>85%) of which occur in low and middle-income countries (LMIC). Cervical cancer is often the leading cause of cancer-related mortality and ranks among the most important causes of all-cause mortality in LMIC. The societal impact of cervical cancer is more profound than for most other cancers because it strikes women and often kills women, in their 30's, 40's, 50's, when they are still raising families and highly productive members of their communities (WHO 2016). One such place that suffers a disproportionate burden of cervical cancer is Viet Nam, where cervical cancer is known as the "Women's plague" or the "Women's death".

HPV infection doesn't only affect women. Men also have HPV infection related cancers. According to recent data from CDC (CDC 2012), the prevalence of men who were diagnosed with HPV was increasing.

Men who had sex with men are 27 times transmission of HPV comparing with those who had sex with heterosexual intercourse only (CDC, 2012). In 2010, there were 800 men had penile cancer, 1100 had anal cancer and 5700 suffered head and neck cancers resulting from HPV (CDC, 2012).

Fighting with HPV in Males is a very important public health issue. And the numbers of cases were diagnosed cancers related to HPV increase every year, Palefsky (2007) reported that "most of Human papillomavirus infection come from men transmitted to women through sexual activity". The developing of vaccine in recent years has spurred controversy over should males have vaccinated against HPV like women. A study reported that the impact of HPV on males are similar rate of HPV infection with women (0.29 to 0.39 per 1,000 person-months), but men and women have different immune responses (Giuliano, 2011).

We now understand that persistent cervical infections by certain HPV genotypes ("types") are the necessary cause of cervical cancer and its immediate precursor lesions. Discovery of the obligate cause of cervical cancer has led to rapid development of two technologic advances: 1) Prophylactic vaccines

against HPV infections for primary prevention and 2) HPV testing to identify women with precancerous lesions in need of treatment for secondary prevention.

In 2006, Merck pharmaceutical company released the vaccine can protect four types of HPV (type 6, 11, 16, 18), called Gardasil. Type 6, 11 cause genital warts and type 16 and 18 can cause of mostly HPV infection cancer in men and women. And the vaccine was approved for females from 9 to 26, for males from 9 to 26 (Canadian press, 2010)

Clinical trials have proven that the Gardasil vaccine is 100% effective for both male and female in preventing HPV infection if all three doses are administered within the recommended time frame (within 6 months) and prior to sexual debut (Markowitz, 2007). In 2009, a bivalent HPV vaccine, Cervarix, was licensed for use only in females ages 10 to 25 years. Cervarix protects against HPV types 16 and 18, which are known to cause cervical cancer. The Cervarix vaccine does not protect against genital warts and has not been licensed for use in males.

Many individuals may question the benefits of vaccinating a boy against HPV however HPV vaccine in boys are not only protect against HPV cancer but also bring a lot of benefit for women. Vaccination in boys can protect women from HPV cancer such as cervical cancer, head and neck cancer. In addition, men have sex with men will have protection against HPV infection through HPV vaccination. (Giuliano, 2008; Szarewski, 2008, Zimet, 2009; Rosenthal, 2010).

There are some significant barriers to persuade men get HPV vaccination. The Vaccine cost for doses is still high. Especially, the cost still very high compare to developing countries. And the awareness of the benefits of HPV vaccine for males are much lower than females. And the reason for women who have more awareness than men due to it is still strong linkage with Cervical cancer prevention (Francis, 2010).

According to Vietnam journal of Public Health, 2016, average age for the first sex intercourse in Vietnam is 19.7 and will have sex younger and younger.

For those reasons, researcher wants to focus about secondary school students from 11 to 15 years old.

The barrier for HPV vaccination on boys students are related to social culture from parents .Since Vietnam is Asian country and the culture of Vietnam is affect the culture of Asian country. Parents don't want their children know about sexual topic when their boys too young (Lan ,2017).And another reason is the HPV vaccine price is a little higher compare to personal income in Vietnam (Bach , 2018).And final reason is ,parents are not have enough knowledge about HPV ,that's why they are afraid side effects of HPV vaccine (Bach ,2018).

The Health Belief Model (Rosenstock, 1988) is an appropriate theoretical for the design of this study survey, as the important investigator set out to examine the predictors to students' health-related action, which include the perceive severity, consequences, benefits and perceive barriers and cues to HPV vaccination (Reynolds, 2011). And the outcome variables will be measures are HPV knowledge, perception, and vaccination HPV uptake

There are no studies about HPV Health talk education intervention in Vietnam among mothers of males' students. This study assesses mothers' knowledge, perception, intention about HPV, HPV vaccination and measures whether a Health talk Educational intervention affects these factors.

Health talk education program is the intervention that health care provider will give presentations about HPV knowledge ,perception and intention information to mothers of boys students .And after presentation ,health care provider and mothers will have discussion ,questions and answers about the program that mothers learned .

Researcher want to do HPV Health talk education intervention in Hue province because Hue province is one of the highest education place in Vietnam so it is easy for training people .In another hand , Hue province have higher medical system such as it had many medical centers ,big hospital so it is easy to access HPV vaccination .

1.2 Research questions

1. Does Health Talk program effect on knowledge ,perception ,intention of HPV vaccination among mothers of boys secondary school students?
2. Are there any differences of knowledge, perception ,intention about HPV vaccination between intervention and control group at Baseline?
3. Are there any differences changes of knowledge, perception and intention after receiving intervention between intervention and control group ?

1.3 Hypothesis

Ho: Health talk education program will not affect on HPV knowledge, perception, and vaccination intention among mothers of secondary school boys students.

Ha: Health talk education program will affect on HPV knowledge, perception, and vaccination intention among mothers of secondary school boys students.

1.4 Objective

General Objective:

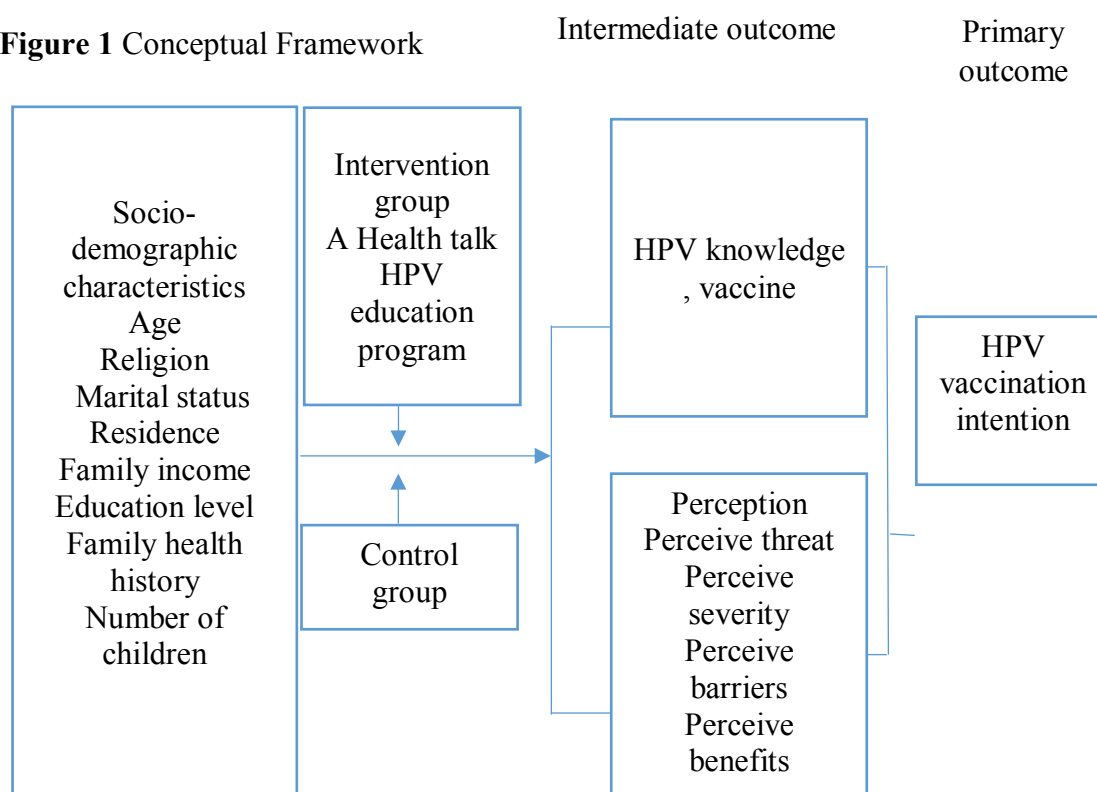
To assess an effectiveness of “Health talk” program on knowledge, perception and intention of Hpv vaccination among mothers of secondary school boys students.

Specific Objective:

1. To compare knowledge, perception and intention of Hpv vaccine among mothers’ of male secondary school students between intervention and control group on Baseline.
2. To compare change of knowledge, perception and intention between intervention and control group after receiving intervention.

1.5 Conceptual Framework

Figure 1 Conceptual Framework



1.6 Operational Definition

Mothers ages: In this study, mothes referred to anyone above 31-60 years

Students ages: Secondary school boys students who are 11 to 15 years old.

Religion: parents who believe in Buddhist, Christian or other.

Health history: a holistic assessment of factors (knowledge about reproductive health) affecting a student's health status. Measuring want to know someone care about genital warts.

Residence : Mothers of secondary school boys students who live in rural or urban areas.

Family income: Family income is a measure of the combined incomes of all people sharing a particular family. With high income come from higher than 10 millions vnd usd up per person. Middle income from 5 to 10 millions vnd per person. And low income lower than 5 millions vnd per person every month.

Marital status : Mothers of secondary school boys students who are single ,married ,divorced or other .

Education level : Mothers of secondary school boys students who got high school ,bachelor, master ,Phd degree.

Knowledge: understand of HPV knowledge, the HPV vaccination. HPV knowledge will be measured by mothers' score on the "HPV knowledge" section on the pre- and post-intervention surveys.

Health talk education: using Power point presentation such as presentation, discussion to educate students to increase their knowledge about perception of HPV, HPV vaccination, HPV vaccination intention.

HPV intention: Measuring intention by whether mothers intends on vaccination.

Health talk intervention: An HPV educational program that will be Power point-based (using presentation, discussion, booklet and other sources of information technology). HPV educational intervention content focus on HPV knowledge, HPV vaccine intention. And questionnaires to measure HPV knowledge, HPV intention and uptake.

Effect: Changes before and after intervention by measuring parents HPV knowledge and HPV vaccination intention.

Effectiveness :the degree to which something is successful in producing a desired result; success.

HPV perception awareness was defined as the level of perceive threat, severity, benefit, barriers reached by study participants and measured using a quantitative score.

Perceived threat: A persons overall evaluation of whether they or another person is at risk of being exposed of contracting HPV. Perceived threat will be measured by parents' score on the "perceived threat" section of the pre-and post-intervention surveys.

Perceived severity: A persons overall evaluation of the consequences or instance of sever adverse health outcomes that could result from not getting the

HPV vaccine. Perceived severity will be measured by mothers' score on the "perceived severity" section of the pre- and post-intervention surveys.

Perceived benefits: A persons overall evaluation of the extent to which HPV vaccination uptake enhances a person's health by preventing HPV and its associated adverse health outcomes. Perceived benefits will be measured by mothers' score on the "perceived benefits" section on the pre- and post-intervention surveys.

Perceived barriers: The obstacles or factors that a person believes hinders or prevents them from having a positive HPV vaccination intention. Perceived barriers will be measured by mothers' score on the "perceived barriers" section on the pre-and post-intervention survey

CHAPTER II

LITERATURE REVIEW

Overview

There are a number of limitations to the growing body of literature on mothers' knowledge and perception of HPV, and vaccination intention among male students. First, many studies were focus on and HPV vaccine was licensed for use in females only (studies prior to October 2009). This is problematic in that many of studies report that parental knowledge, perceptions, vaccination intention and uptake are largely influenced by a lack of knowledge of the vaccine due to its' unavailability or recent debut on the medical market at that time. Furthermore, these studies only capture parents' HPV vaccination intention and uptake for female children. Very few studies have examined parental HPV vaccination intention in male children. There are no studies that assess the climate for HPV knowledge, perceptions and vaccination intention of mothers of male students in Vietnam. This study will focus on the HPV vaccination intention of mothers who live in Hue city, Vietnam, who have male children who are from 11 to 15 years old.

2.1 HPV and Cancer

From 1989 -2006, in UK, the incidence of SCC of the oral cavity and oropharynx in males increased by 51% [10, 11]. Globally, 38,000 new cases (85%) of head and neck cancers, 35,000 (87%) cases of anal cancers and 90% of cervical cancer are caused by HPV [1].

Table 1 Nuber of HPV-Associated and HPV-Attributable Cancer Cases per Year

Number of HPV-Associated and HPV-Attributable Cancer Cases per Year			
Cancer site	Average number of cancers per year in sites where HPV is often found (HPV-associated cancers)	Percentage probably caused by any HPV type ^a	Number probably caused by any HPV type ^a
Cervix	11,866	91%	10,751
Vagina	846	75%	635
Vulva	3,934	69%	2,707
Penis	1,269	63%	803
Anus ^b	6,530	91%	5,957
Female	4,333	93%	4,008
Male	2,197	89%	1,949
Oropharynx	18,226	70%	12,885
Female	3,412	63%	2,160
Male	14,814	72%	10,725
TOTAL	42,671	79%	33,737
Female	24,391	83%	20,260
Male	18,280	74%	13,477

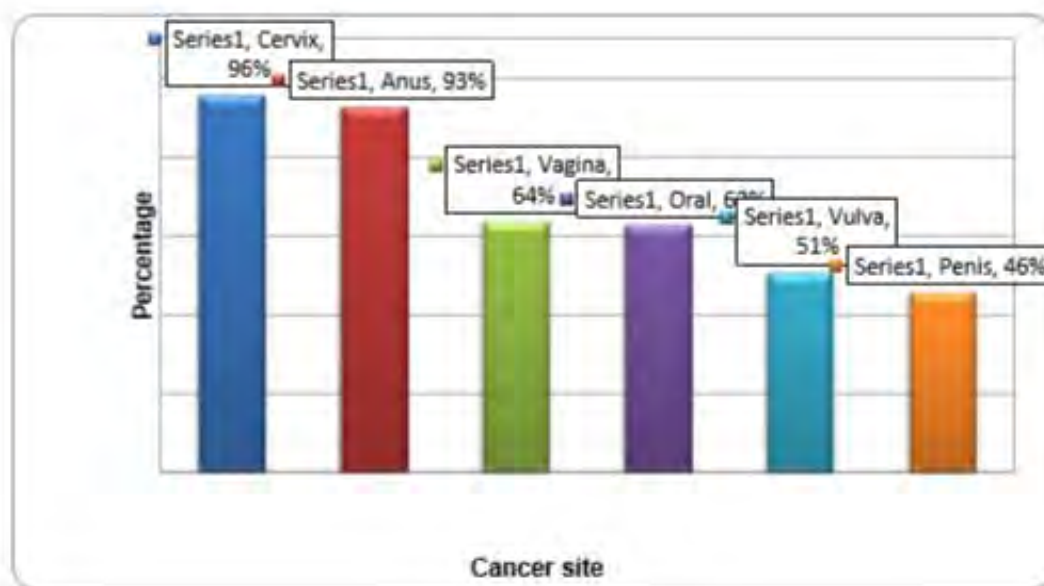
^aHPV types detected in genotyping study; most were high-risk HPV types known to cause cancer (Saraiya M et al. [U.S. assessment of HPV types in cancers: implications for current and 9-valent HPV vaccines](#). *Journal of the National Cancer Institute* 2015;107:djv086).

^b Includes anal and rectal squamous cell carcinomas.

(CDC, 2015)

Summary Report (2010) revealed that HPV type 16 and type 18 can cause more 75% of cervical cancers and many kinds of other cancers. The report showed evidence that the following HPV types (31, 33, 35, 39, 51, 52, 56, 58, and 59) was increasingly related with cancers caused by the virus. HPV type 33 has been linked with vulva cancer, anal cancer in both men and women (WHO/IARC, 2010). The data confirm the HPV virus is linked to almost cancers of the genital region. Multiple studies have shown that HPV could cause anal cancer (90%–93%), or pharyngeal cancer (12%–63%), penile (36%–46.9%), vaginal (40%–64%) and vulvar cancers (40%–51%) (Giuliano, 2011).

Table 2 Annual rates of HPV DNA found in cancer for each anatomical site HPV DNA 978 prevalence among cases of cancer



(CDC, 2012)

With the increasing numbers of cases related HPV infections, researchers with the CDC (2012b) conducted a study examining the most recent cancer data in the United States. The researchers of the report noted that, “population-based cancer registries are important surveillance tools to measure the impact of cancer rates on public health interventions such as vaccination and screening” (CDC, 2012b).

The purpose was to identify the role of HPV in the reported cases of cancer in 2004-2008. The most cancer registries in the nation were used to obtain data for cancers of the cervix, vagina, vulva, penis, anus, and head and neck, oropharynx (CDC, 2012b; Gillison, 2008).

2.1.1. HPV-related Cancer and Men

One of the most primary challenges related to HPV cancer in male is their latency, because they could be infected HPV without any signs or symptoms (Palefsky, 2007).

The National Cancer Institute (NCI) (2012) recently revealed that roughly 85% of all cases who had anal cancer are caused by infection HPV type 16 and type 18.

According to the (NCI, 2012), high risk factors for anal cancer include:

Man papillomavirus (HPV),

Males are over 50,

People who have multiple sexual partners,

Engaging with anal intercourse,

Frequently anal redness, soreness.

The incidence patients who had anal cancer is approximately 1.5/100,000 in the general population (Palefsky, 2011) reporting that, “the incidence Will be increase by approximately 2% annually year among both males and females in the general population” According to the CDC, men who have sex with men (MSM) have more than 17 times to develop anal cancer (CDC, 2012).

According to WHO 2018 . Number new cases of anus cancer in Vietnam are 461people in 2018 .Rank 28 compare to other kind of cancers .

2.1.2. Penile Cancer

Although HPV infection related to penile cancer is rare in the United States, the rate of disease is much higher in developing nations. Bleeker , (2009) showed that, “The disease can constitute up to 10% of malignant disease in men in some African, Asian, and South American countries, with incidence rates of 4.2 and 4.4 per 100,000 in Paraguay and Uganda, respectively”.

Bleeker et al. (2009) added that “penile cancer is predominantly seen in men who have not been circumcised shortly after birth, and is very rare in populations who routinely practice circumcision during the neonatal or childhood period” Poor hygiene is also a predominant risk factor for the development of HPV-related infections and diseases. Palefsky (2011) also reported that, “The incidence of penile cancer is low relative to cervical cancer,

particularly in developed countries. This may, in part, reflect different rates of circumcision, which is known to be a protective factor for penile cancer”.

According to WHO 2018 . Number new cases of penile cancer in Vietnam are 330 people in 2018 .Rank 31 compare to other kind of cancers .

2.1.3. Or pharyngeal cancer

HPV is associated with oropharyngeal cancers. Or pharyngeal cancer also seems to disproportionately affect men. In 2009, there were approximately 13,000 new cases of OPC in the United States, 10,500 (81%) of which occurred in men (Gillison, 2015). Furthermore, it is estimated that by 2020 the cancers in the United States, roughly 85% of which will occur in men (Smeets, 2011).

According to WHO 2018 . Number new cases of oropharyngeal cancers in Vietnam are 2211 people in 2018 .Rank 15 compare to other kind of cancers .

2.2 Perceive HPV knowledge

Many Studies indicated that both young female and male lack of knowledge about sexually transmitted infections include HPV knowledge (CDC, 2015). A review of educational intervention studies showed that lack of HPV knowledge is a common barrier to HPV vaccination uptake. Knowledge about HPV tended to increase post-intervention (Patel, Zochowski, 2012).

The survey respondents consisted of a randomized sample of female workers in one factory of over 20,000 employees in South Vietnam. The survey about HPV awareness was conducted in January 2017 175 surveys were distributed and 168 surveys were collected. The response rate was 96% .The actual name of the factory participating in the survey is not mentioned to protect their privacy (Anh, 2012).

Vietnam is similar to many other developing countries, cervical cancer is one of the most common cancers among women (Ferlay, 2010). Since the Vietnamese population as a whole is currently relatively young, many female are at a reproductive age and thus are at a high risk of HPV infection (Anh, 2012).

The HPV vaccination is recommended for girls ages from 11 year in Vietnam (NIHE, 2017).

Because most HPV vaccine are recommended at much younger age (Proma, 2012), little is known about how responsive Vietnamese pursue other recommended immunizations. Lack of HPV vaccine information was the largest barriers among Vietnamese girls and young women (Anh, Hieu, 2003). Previous studies on HPV in Vietnam only targeted a specific population of girls and their parents (Galagan, 2013) or sex workers (Vu, 2013) which limit the generalization to other subgroups. Overall, few studies about the knowledge, beliefs related to HPV knowledge and the HPV vaccine among college students in Vietnam. In particular, research on knowledge, beliefs of HPV and HPV vaccine among male students in Vietnam is scarce.

2.3 Perceived HPV vaccine safety and efficacy

Vaccine efficacy and safety are commonly reported as an influence in parents' HPV vaccination intention and uptake (Brewer & Fazekas, 2007; Sturm, Mays, & Zimit, 2005; Kennedy, Sapsis, Stockley et al., 2011). For the most part, researchers have found that parents who are unclear and uncertain or lack knowledge about the HPV vaccine often have serious misconceptions that generate fear of vaccine safety and efficacy which in turn lowers vaccination intention and uptake. On the other hand, studies have found that parents who trust the safety and efficacy of the HPV vaccine often have higher HPV vaccination intention (Reynolds and O'Connell, 2011).

All three HPV vaccines are highly efficient in preventing infections against the types of HPV they protect against (Dawar, 2007; Public Health Agency of Canada, 2015). These vaccines are most effective when administered prior to the onset of sexual activity, when the likelihood of infection is very low. An extensive explanation of vaccine efficacy data is beyond the scope of this summary due to the complexity of this data: see Garland et al. (2016) for the

most up-to-date review of the global effect of 4-valent HPV vaccination on HPV infection and disease as well as Schiller et al. (2012) for a review of HPV vaccinations clinical trials. Other extensively cited (>500 citations) HPV vaccine efficacy clinical trials can be found here: (Schiller, 2012; Villa, 2005).

In order to address this factor, many physicians are engaging in translating knowledge for parents and children. Some physicians identify eligible patients and increase dialogue with parents regarding the scientific evidence demonstrating HPV vaccine safety and efficacy, the benefits of getting the HPV vaccine, and the consequences and severity of adverse health outcomes that could result from not getting the vaccine. In addition to building physician-parent-child rapport increasing vaccination intention and uptake, this relationship also helps to ensure dosage completion, as this is an essential part of the HPV vaccination efficacy.

2.4 Perceive vaccine accessibility

There are a number of barriers that can inhibit a person from accessing reproductive and sexual health services, including socio-cultural, environmental, and economic factors. Access to reproductive and sexual health information and services can be influenced by many socio-cultural factors. In some cultures, class and social values can influence sexual expression, expectations and behaviors. Studies have shown that spirituality, religion and cultural traditions specific to ethnic background can influence parents' HPV vaccination intention and uptake (Moutsiakis, 2007; Peters, 2006; Gullatte, 2006; Brabin et al., 2006). In a 2004 study on young people's sexual risk-taking behaviors, Thianthai found that socio-economic backgrounds in Bangkok influenced different social expectations of male and female sexuality and sexual behavior (Thianthai, 2004). In many Asian counties, these beliefs and behaviors are rooted in traditional social and cultural norms, and often discourage public discussion of sex topics. Furthermore, premarital sex is considered unacceptable, thus preventing young people from accessing reproductive and sexual health information and services (Sridawruang, 2010). On the other hand, adolescent religious affiliation can be

associated with delayed age of first intercourse and greater and more consistent contraceptive use (Meschke, 2002).

In some Asian countries, these beliefs, behaviors are rooted traditional social, cultural norms and often limit discuss about sex topics. Premarital sex is always unacceptable, thus limit young people access reproductive, sexual health information and services (Sridwruang, 2010). In the other hand, young people religious can be affected with delayed age of first intercourse (Susan, 2014). In some countries are striving to overcome the environmental obstacles in HPV vaccination accessibility. For examples, in US, researchers found that if young people receive HPV education, and vaccinations are free they are more knowledgeable to make informed decisions regarding vaccination intention, uptake (Brabin, 2006).

In the other hand, financing of the HPV vaccine became tough decision for young people who live in developing countries where HPV vaccine is not included in the national immunization program. People must pay for the vaccine costs (Dempsey 2006).Such as Vietnam ,people have to pay 49.3 usd per dose for HPV vaccination and just have people who are more than 30 years old ,they are more willing pay for HPV vaccination (Bach ,2018).

2.5 Family Structure and Roles in Vietnam

In Vietnamese families, mothers spend more time to take care of children's health, and take charge of their self-care, as well as nutrition monitoring than fathers do (Locke et al. 2012). It is therefore usually easier for mothers to talk about the sensitive issues such as reproductive health or sexual health and others to teenagers than fathers (Lan ,2017).In order to understand whether parents of boys have any plans for HPV vaccination if HPV vaccinations are available, we wanted to investigate if they have the required knowledge about HPV and if they have intentions to have their male children HPV vaccinated.

2.6 Behavioral change interventions

The key aspects of the Behavioral Change Model include knowledge acquisition, instilling of positive attitudes, creation of skills, increased awareness, motivation and intention, and ultimately the uptake of a promoted behavioral outcome. This model ties in nicely with the HBM, as the intervention was designed with the aim to increase expat parents knowledge, instill positive perceptions while dispelling negative perceptions, and develop decision-making skills and motivation to make informed vaccination-related decisions.

The Health Belief Model (HBM) (Rosenstock, 1988) is an appropriate theoretical framework for the design of this study survey.

If parents don't believe there is any benefit for them to be vaccinated they will not pay attention and to have lower HPV vaccination intention, uptake, If they believe there have a positive outcome related vaccination then they will have a greater vaccination intention, uptake (Krawczyk, 2012). Furthermore, when parents are more susceptible to being exposed to, or may be at risk of becoming infected with HPV, they are more likely to have positive vaccination intention and uptake (Reynolds, 2011). And other studies demonstrate how knowledge, attitudes can influence behavior change, including HPV vaccination uptake (Spleen, 2012).

2.7 Parents HPV education Intervention

Education for providers is need on how to talk to their parents about the vaccine on children. In an HPV educational intervention study, it was suggested that once parents decide to sit down and talk to their children about HPV and HPV vaccine this could be "teachable moment" that will provide parents the chance to also discuss reproductive health (Gainforth, 2012). Health talk education materials are more effective if they contain pictures such as photos, graphics that are familiar to the audience and culturally relevant (Gainforth,

2012). Health education also should be offered in accessible locations (health fairs, sporting events, and community clinics).

The systematic review found that the 11 HPV health education interventions for parents used a variety of educational approaches. Printed educational materials were most commonly used, especially the materials developed by CDC (Dempsey, 2006). While study using the materials showed increases in parental knowledge and acceptance, it is important to test materials developed elsewhere with new populations before using them. For example, HPV health education materials developed by CDC include a booklet in Tagalog. The booklet is long and only addressed the HPV vaccine briefly on one page.

There are many study mentioned about adolescents and young people can get a lot of benefit from parental support in educating about sex topics, preventative measures (Schuster, 2008). To address these often-controversial issues, parental sexual education programs have emerged in countries all over the world. Many of these programs aim parents as important role of support information about sexuality and sex topics for their children. These programs often contain behavioral change elements to increase parents' knowledge, improve their intention and perspective, motivate actions which facilitate comfortable parent-child communication about sex topics, and increase parents' role in taking preventative measures and risk reduction for their child

This study hopes to build on the proven success of Health talk education –learning resources to create and distribute an intervention that influence positive behavioral change. This study measurement tools such as questionnaires, and the intervention will be structured in an easy to use comprehensive format. Furthermore, mothers will be provided with an appropriate detail and elaboration of education information so that the time of intervention will be brief, however the intervention content will be sufficient.

2.8 Research article:

Reference	Study title	outcome	Study population	Study design	Result
Basu, 2011 J Obstet Gynaecol Res	Acceptability of human papillomavirus vaccine among the urban, affluent and educated parents of young girls residing in Kolkata, Eastern India	O: HPV vaccination intention for daughters A: Single survey item (agree, refuse, undecided) assessed pre- and immediately postintervention	22 middle/high income parents with at least high-school education with one or more girls age 9– 26	Quasi-experimental	Authors reported Pre-intervention: 51% agree to give vaccine to their child Post-intervention: 74% agree to give vaccine to their child P <0.05

Reference	Study title	outcome	Study population	Study design	Result
Chan, 2007 J Adolesc Health	Women's Attitudes on Human Papillomavirus Vaccination to Their Daughters	O: HPV vaccination intention for daughters A: Single survey item (agree, disagree, undecided) assessed pre- and immediately postintervention	170 mothers of girls age 8–18	Quasi-experimental	1.60 (1.23, 2.08) c Authors reported change in agreement to vaccinate as: agree:+20%, disagree:

					-8%, P<0.001
--	--	--	--	--	-----------------

Reference	Study title	Outcome	Study population	Research design	Result
Davis, 2004 J Low Genit Tract Dis	Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents.	O: "Do you want your child/ children to receive the HPV vaccine?" A: Single survey item (yes vs. no + no response) assessed pre- and immediately postintervention	506 parents and guardians of boys and girls age 10–15	Quasi-experimental	1.37 (1.25, 1.51) d Authors reported change in agreement to vaccinate as: yes: +20%, no: -3%, no response: 17%. P<0.05

Reference	Study title	Outcome	Study population	Research design	Result
Dempsey, 2006 Pediatr	Factors that are associated with parental acceptance of human papillomavirus vaccines: a randomized intervention	O: HPV vaccination acceptability for 3 potential age groups: "infants," preadolescents (8–12) and "older teenagers" A: Average score of 3 items (each 10-	840 parents of boys and girls ages 8–12 Some college (53.4%), High school or less(9.3%) White	Randomized controlled trial	I: 6.56 (6.28–6.84) C: 6.28 (5.99–6.57) Between-group P = 0.17

	study of written information about HPV.	points with higher scores indicating higher acceptability) assessed in a survey mailed with information sheet	(75.2%), Asian (11.4%), Black (5.1%) Hispanic (4.1%)		
Reference	Study title	Outcome	Study population	Research design	Result
Kennedy, 2011 J Health Commun	Parental attitudes toward human papillomavirus vaccination: evaluation of an educational intervention	O: HPV vaccination intention for daughters if physician recommended A: Single survey item, (0 = strongly disagree, 10 = strongly agree) assessed in a survey mailed with information sheet	205 parents of girls ages 11–18	Randomized controlled trial	I: 5.9±3.1 C: 5.7 ± 2.7 No P value provided Pre-intervention : 5.8 ± 3.0 Post-intervention : 5.9 ± 3.1 P = 0.17

Reference	Study title	Outcome	Study population	Research design	Result
-----------	-------------	---------	------------------	-----------------	--------

Kepka, 2011 J Commun Health	Evaluation of a radionovela to promote HPV vaccine awareness and knowledge among Hispanic parents.	O: “How likely is it that your daughter will receive the vaccine in the next 12 months? (Very Probable)” A: Single survey item (yes vs. no) assessed immediately post-intervention	60 Hispanic parents and guardians of girls ages 9–17 Income of	Randomized controlled trial	0.86 (0.65, 1.13) e Authors reported results as 61% of intervention vs. 67% of control group answered very probable P = 0.58
-----------------------------	--	--	---	-----------------------------	--

Reference	Study title	Outcome	Study population	Research design	Result
Spleen, 2012 J Cancer Educ	An increase in HPV-related knowledge and vaccination intent among parental and non-parental caregivers of adolescent girls, age 9-17 years, in Appalachian	O: HPV vaccination intention for daughters within 1 month and within 6 months A: Two survey items reported separately (0 = extremely unlikely, 3 = extremely likely) assessed pre- and	38 parents of girls ages 9–17, 12 of whom had already started HPV vaccination series White non-Hispanic (95.5%), Hispanic	Quasi-experimental	Pre-intervention: 0.72 Post-intervention: 1.38 P = 0.002 6 months: Pre-intervention: 1.46 Post-intervention: 1.84 P = 0.07 No standard deviations for

	Pennsylvania	immediately post-intervention	(2.7%), other (1.8%)		means reported
--	--------------	-------------------------------	----------------------------	--	----------------

Reference	Study title	Outcome	Study population	Research design	Result
Doherty, 2008 Int J Sex Health	The Effects of a Web-Based Intervention on College Students' Knowledge of Human Papillomavirus and Attitudes toward Vaccination	O: HPV vaccination A: Change in average score of 7 items including: willingness to obtain the vaccine (1 = strongly disagree, 5 = strongly agree) assessed immediately post and one month postintervention	119 male and female college students White (93%), Asian-American (3%), Black (1%), other (3%)	Randomized controlled trial	Immediately postintervention : I: 2.7 ± 2.8 C: 1.2 ± 1.9 P = 0.036 1 month post intervention: No significant difference Average scores 1 month post-intervention depicted graphically only (no numerical results reported).

Reference	Study title	Outcome	Study population	Research design	Result
Krawczyk, 2012 J Am Coll Health	How to Inform: Comparing Written and	O: HPV vaccination intention A: Single item, 7	200 male and female college	Randomized controlled trial	I: 4.39 ± 1.86 C: 3.88 ± 1.77

	Video Education Interventions to Increase Human Papillomavirus Knowledge and Vaccination Intentions in Young Adults	point scale (1 = not at all to 7 = definitely) assessed	students White (61%), non-White (38.5%)		P<0.05 I2: 4.57 ± 1.90 C: 3.88 ± 1.77 P<0.05
--	---	---	---	--	---

Reference	Study title	Outcome	Study population	Research design	Result
Lloyd, 2008 J Adolesc Health	The effect of school-based cervical cancer education on perceptions towards human papillomavirus vaccination among Hong Kong Chinese adolescent girls.	HPV vaccination intention A: Single item, (1 to 4, 4=very likely) assessed immediately postintervention	74 boys and girls ages 13–16	Randomized controlled trial	I: 3.36 ±0.74 C1: 3.09±0.8 No significant difference I: 3.36 ±0.74 C2: 3.00 ±0.89 P = 0.02

2.9 Summary

This study hopes prove the successful of using education tool resources to distribute an intervention that influence positive behavioral change among mothers, Vietnam. According to similar previous studies to exposure this studies' content, study measurement tools such as questionnaires, surveys. Moreover, parents would be provided with good detail and elaboration of educational information so that the time of education intervention will be short. This study would like to do intervention on mothers because we would like mothers in Vietnam after they have knowledge, they will change their thinking about HPV prevention for their child. And mothers who are the most important role in deciding their child for HPV vaccination or not. Because they pay money for vaccine and they also have right to sign consent form.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Study design

This is a Quasi-experimental study which is an appropriate design for this study. Because, it is a good tool to measure the influence of educational intervention on mothers' knowledge of HPV, HPV vaccine intention among mothers. Divide secondary school male students are arranged a intervention group who received the educational intervention, and a control group that have not receive the intervention until the study is finished. The study will be performed from June 2019 to February 2020 with the objective to investigate effect of an educational intervention on HPV knowledge, HPV Vaccine intention among mothers of secondary school boys students in Hue City, Vietnam.

3.2. Study area

The study was conducted at secondary school in Hue city. Hue is the old capital of Vietnam. The population in Hue is 1.1 million people.

Hue City has 24 secondary schools .Researcher will pick 2 secondary schools by purposive. The Hue, Nguyen Chi Dieu and Chu Van An secondary school. Because these 2 schools have similar characteristic, similar sizes (similar male students ,similar number of eligible mothers of boys students between schools).

Figure 2 Study area map



3.3 Study population

The target population of this study will be mothers of students of secondary school in Hue city from 11 to 15 years old. Students of all race and program enrolled were included. Mothers of secondary school boys students in Hue will be purposively selected as this study population. Researcher would like to choose purposive 2 secondary schools far away at least 5km because they want to limit contamination from sharing intervention knowledge between intervention group and control group. And researcher would like to find 2 secondary schools which have similar characteristic.

This population will be chosen as a test population of students to measure whether an HPV health talk education intervention program has any effect on HPV knowledge, HPV vaccination intention among Mothers of male students.

3.4 Sample size

Using application program G power will be used to calculate sample size.

Sample size calculation:

According to previous study (Chan, 2007). Having change intention of **HPV vaccination intention among mothers** intervention group and control group. Using the **G power application** with testing two Proportions, I **have sample size**. To minimize the potential effect of drop out. 10% is to the sample calculation for each group.

Type of power analysis	
A priori: Compute required sample size - given α , power, and effect size	
Input Parameters	Output Parameters
Tail(s)	Two
Proportion p2	0.2
Proportion p1	0.08
α err prob	0.05
Power (1- β err prob)	0.8
Allocation ratio N2/N1	1
	Critical z
	1.9599640
	Sample size group 1
	131
	Sample size group 2
	131
	Total sample size
	262
	Actual power
	0.8028312

According to previous study (Chan, 2007). Having proportion of initial HPV vaccination intention intervention group is 20 % and control group is 8%. Using the application with testing two independent proportion, I have sample size is 131.

To minimize the potential effect of drop out 10% is to the sample calculation for each group ($n=131+13$).

The inclusion criteria for participants

- (1) Mothers of secondary school boys students in Hue city, students age from 11 to 15
- (2) Mothers of these students provide written consent and be willing to participate in the study
- (3) Not have severe allergies or serious diseases that require immediate medical attention (Parents and children)
- (4) Mothers of secondary school boys students ages from 31 to 65
- (5) Mothers who can take responsible for their children vaccination (they will make decision for your sons give HPV vaccination).
- (6) Mothers of secondary school boys students in Hue city who had email

Exclusion criteria for participants

- (1) Knowingly can not participate throughout the whole study
- (2) Mothers of secondary school boys students who had HPV vaccination
- (3) Secondary school boys students who had HPV vaccination

Mothers of secondary school boys students who are not completely attend the full education intervention course .If they are not attend education intervention course for 30 mins it mean they will be excluded for this course .

3.5 Sampling technique

After obtaining permission from class instructors, verbal announcements will be made in various classes in each secondary school courses at the end of lectures. These announcements consisted of a short description of the study objectives and protocol about the research. In some way let students know that they will receive some benefits when their mothers join this study such as they and their mothers can know about the HPV knowledge, risk and how they prevent from HPV infection after they join this study. After researcher introduce about program, Researcher will give intervention form to students and get email of students from secondary school office. And teachers of every class will get back forms from students after 24 hours.

Hue has 24 secondary schools. Researcher will choose 2 secondary schools which are Nguyen Chi Dieu secondary school and Chu Van An secondary school .These 2 schools will similar characteristics (similar education level, same number classes, similar boys and girls students) , and the distances between 2 school about 5 km .

Researcher will make appointment with students' mothers at class through teacher helping. Researcher will mention again about this study to mothers at class and let they know they will receive benefit through this education intervention .Then researcher will give to every mothers consent form who will join this study will sign consent form .And the education intervention will take place at class .The time of the education intervention will be on weekend since mothers of students they have free time to join this research.

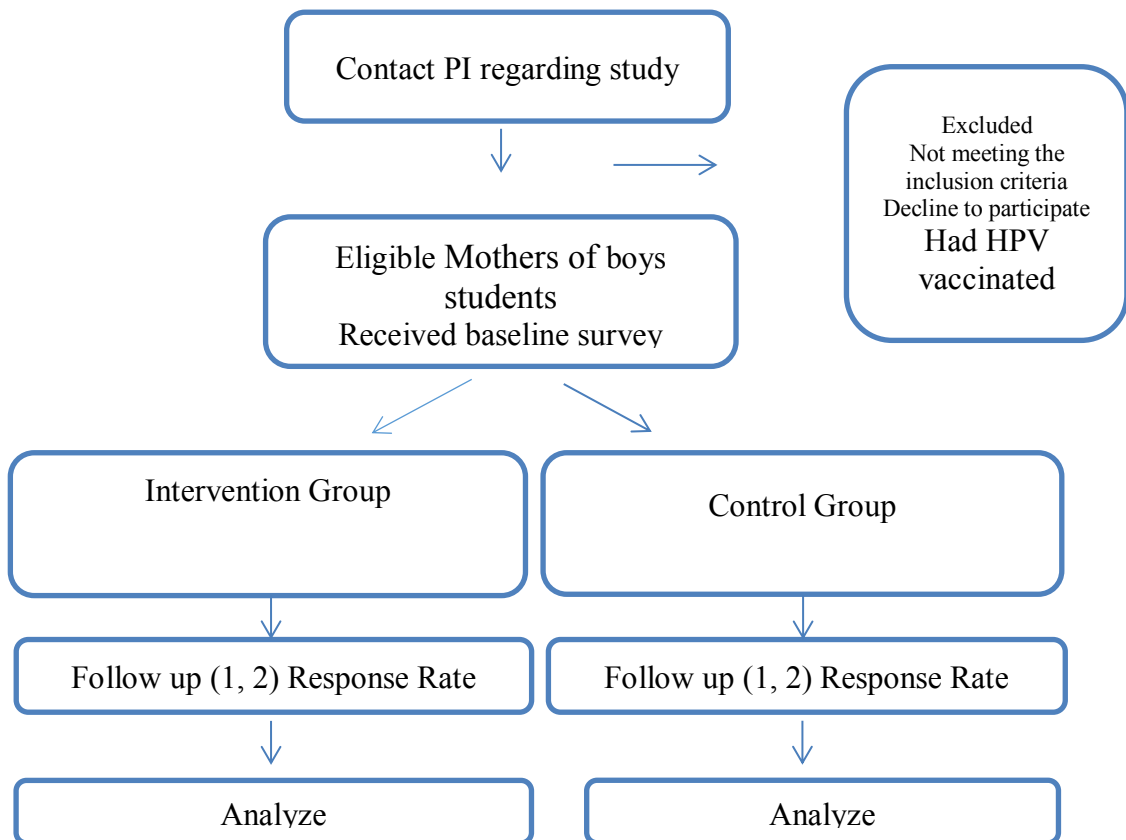
Brief screening questionnaire will have questions which will generate answers that make sure the principal investigator to be sure the mothers can participate in the study. Inclusion criteria included:

(1) Mothers of secondary school males students ,students ages from 11 to 15 in Hue City. (2) Mothers of these students must provide written consent and be willing to participate in the study. (3) Not have severe allergies or serious diseases that require immediate medical attention (Parents and children) (4) Mothers of secondary school boys students ages from 31 to 65(5) Mothers who can take responsible for their children vaccination In total, we have mothers of students are eligible, willing and provide consent to participate this study. Mothers of students will receive the baseline survey.

Nguyen Chi Dieu school will be chosen intervention group .There are 42 classes in Nguyen Chi Dieu school .There are 1952 students in this secondary school which are 996 boys and 956 girls. In 996 boys students, there are 996 boys who have mothers .According to inclusion and exclusion criteria, there are 398 eligible mothers who join this study. Researcher will send screening questionnaires to teacher of every class. Though screening questionnaires (include inclusion and exclusion criteria information), can know who can available to join the research. Researcher use simple random by computer to pick 144 mothers of males students join this study.

Chu Van An school will be chosen control group .There are 43 classes in Chu Van An school .There are 1890 students in this secondary school which are 983 boys and 907 girls. In 983 boy's students, there are 983 boys who have mothers .According to inclusion and exclusion criteria, there are 386 eligible mothers who join this study. Researcher will send screening questionnaires to teacher of every class. Though screening questionnaires (include inclusion and exclusion criteria information) ,researcher can know who can available to join the research. Researcher use simple random by computer to pick 144 mothers of males students join this study to avoid the bias selection.

The first follow-up survey will distribute within 48 hours after the finished baseline for intervention group. The second follow-up surveys are distributed 3 months after the first intervention end. In total, there will be intervention group and control group responses for the base line, first and the second surveys will be analyze.

Figure 3 Flow chart of Participant Recruitment

3.6 Data collection

Two secondary schools in Hue, Vietnam are recruited for this study. The researcher in Vietnam assisted in the recruitment of secondary schools and participants. The principal of the secondary school were informed about the study and asked for permission from him to carry out the study. An official letter is sent to the principal of school for permission to collect data among mothers of students. Researcher will ask permission to use classrooms for the intervention program from Principal of school.

In Vietnam ,every year have 2 or 3 times that parents of students come to class to listen information about their children .The first time ,they come to class to get information from class on beginning of first semester .The second time ,parents come to class to know about study situation of their children on second semester .The third time they come to class to get information study of their children from teacher before summer vacation .Researcher will come to class one time with cooperate with school teachers to meet their mothers of boys students . Researcher and researcher's assistant will talk to mothers on boys students at class and also show some slides about the education intervention for 5mins .In presentation about intervention, researcher will mention some benefit that participants will get after join this study .After presentation from researcher, investigator will ask mothers of boys students who would like to join this study .If they would like to join this study ,they will sign consent in Vietnamese .

The consent forms will be saved according to official documents of research standards.

Researcher will divide intervention group into 4 groups by computer random and mothers of male students of 4 groups will be received knowledge of HPV from healthcare provider on every Saturday and Sunday morning for 1 month .

It take 4 months (one months for first follow up and three months for second follow up) for education intervention .In intervention group will be received questions from the baseline survey .After baseline survey , mothers of male students of 4 groups will be received knowledge of HPV from healthcare provider on every Saturday and Sunday morning for 1 month .Group 1 and group 2 will join education intervention on Saturday every week for 1 month .Group 3,4 will get education intervention on Sunday morning every week. Total, Every group will have 4 times of education intervention .After 1 month of education intervention ,researcher will measure participants about HPV knowledge ,attitude and intention .Then after 3 months later ,researcher will measure HPV

intention in intervention groups .Because according to Clinicaltrial.gov and Alaina et al ,2015 the time changing from baseline to post intervention to follow up survey for HPV intention ,it take 3months (Health belief model based and knowledge based).That is the time for Changing from baseline to post Intervention to follow-up to 3 months after the interventions the number of participants who Intend to take HPV Vaccine.

By having only a short period of 3 months between the first follow-up and second follow-up survey, this reduced the amount of time that mothers had to access other sources of information, which we hoped would reduce any extraneous variables that could potentially contaminate the study results. It is hoped that this shorter amount of time for study follow-up would also reduce parent drop out or discontinuation from the study, as mothers had less time to loose interest or find the study burdensome or too demanding.

Researcher's assistant include 3 medical doctors to give presentation and 6 assistant to collect data, talk with mothers of boys students and take notes important points during education intervention and Iam will be researcher managerment. They are OBGYN doctors and have more than 10 year working experience about vaccine from hospital and clinics .They have been working at vaccination centers in Hue city .

In control groups, researchers give questionnaires for control groups at baseline. After 1 month, researcher will use the same questions that they measure on intervention groups for control groups. The questions are about HPV knowledge, attitude and intention .Control groups will received the questions the same period time with intervention group however control groups will not get any education intervention from researcher. After 3 months later, researcher will measure HPV intention in control groups.

3.7 Measurement tools

The questionnaire utilized for this study was a 42-items, self-designed survey consisting of five sections: Demographic Information, HPV Knowledge, Perceive threat, perceives severity, perceive benefit and perceive barrier. Individual survey items were adapted and modified from a total of seven previous studies (Bowyer 2013; Gerend 2008; Pelullo, 2012; Ragin, 2009; Radisic 2017; Muhwezi 2014 ; Lia M.Lambert 2014) , and Carolina HPV Immunization Measurement and Evaluation (CHIME) Project (Reiter , 2009). The questionnaire was designed specifically for this project.

The questionnaire was designed specifically for this project. These studies focused on knowledge of HPV and the HPV vaccine, perceive threat and severity, and perceive barrier and benefits concern vaccination influencing changing behavior.

The HPV knowledge section consisted of 16 statements regarding established facts about HPV and HPV risk factors. After reading each statement, participants could choose the responses ‘true’, ‘false’, or ‘I don’t know’. With ‘True’ responses will be scored with 1 point and all ‘false’, or ‘I don’t know’ will be scored with zero. HPV Vaccine Knowledge.. Items in this section included statements regarding the vaccine’s function (e.g., “The HPV vaccine protects against certain HPV infection cancer” If participant answer true it will be scored with 1 point ,If participant answer ‘false’, or ‘I don’t know’ will be scored with zero point).Researcher will provide correct answers after finishing the project.

Perceived threat of HPV infection: 3 sentences response options given were 5-point likert scale ranging from “Strongly agree ”to “Strongly disagree ” (Strongly Disagree Disagree Neutral Agree Strongly Agree) with “Strongly agree” answer will be score 5 point and “Strongly disagree ”answer will be scored 1 point .

Perceived severity of HPV infection 3 sentences with scales ranged from 1 to 5. All participants were asked to rate their personal level of concern about potentially becoming infected with HPV. This rating was made using a 5-point Likert scale ranging from “Strongly disagree” to “Strongly agree”. A response of 5 meant that the participant was “Strongly agree” while a response of 1 indicated that the participant was “Strongly disagree” about becoming infected with HPV.

Perceived barriers and benefits will be measured by with 15 sentences questions with sentences scales ranged from 1 to 5. The response options given were a 5-point Likert scale ranging from “Strongly disagree” to “Strongly agree”. With ‘Strongly agree’ responses will be scored with 5 point and all ‘Strongly disagree’ will be scored with 1 points.

- HPV to be answered on a Likert scale with four response options ranging from “strongly disagree” to “strongly agree”. Perceived barriers and benefits will be measured by with 15 sentences questions with sentences scales ranged from 1 to 5. From Strongly Disagree Disagree Neutral Agree Strongly Agree . With ‘Strongly agree’ responses will be scored with 5 point and all ‘Strongly disagree’ will be scored with 1 points .This section measured Perceived barriers and benefits about HPV and HPV vaccinations. Lia M. Lambert 2014

HPV Vaccination intention: 1 sentence with answer “Yes”, “No” and “Not sure”. Included statements “Do you intend to take your son to get HPV vaccine”.

If their intention to have vaccination, but cannot afford it and have to say no. Researcher will have more questions about what reason why mothers don’t have plan to give their children have vaccination

There are 30 mothers of boys secondary school students were tested for reliability .They are interviewed questions by researcher .

Reliability: KR 20 HPV knowledge is 0.8 . Cronbach’s Alpha of perceived threat of HPV infection is 0.872 . Cronbach’s Alpha of perceived severity is 0.817. Cronbach’s Alpha of perceived barriers and benefits is 0.828 . HPV

vaccination intention just have 1 sentence that's why researcher don't check Cronbach's Alpha .

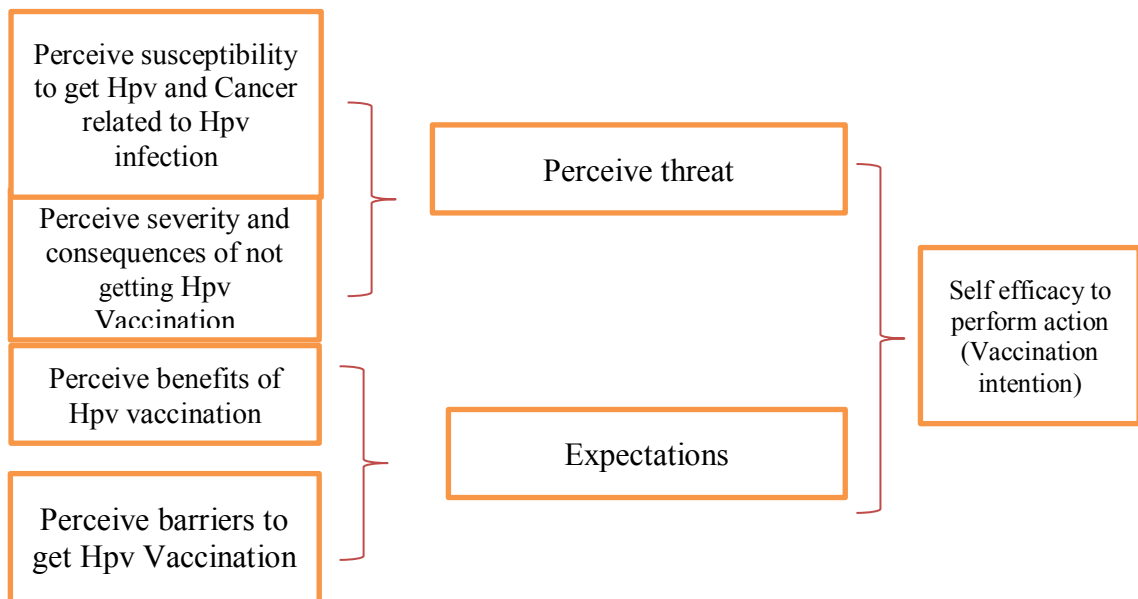
All questionnaires are translated into Vietnamese. Then we have 3 experts check it again . Then translate from Vietnamese to English to check it again.

To test is translate questionnaires from previous studies easy understand or not. If not easy understanding, we will translate again to let people easy understanding questionnaires.

Content validity: 3 experts checked about questions through pilot test for 30 people. Using IOC scores to check content validity. IOC score of HPV knowledge is 0.917 .IOC score of perceived threat of HPV infection is 1.00 score .IOC score of perceived severity of HPV infection is 0.89 .IOC score of perceived barriers and benefits is 0.917. IOC score of HPV vaccination intention is 1.00 score .

This study measurement tool will be designed according to the Health Belief Model (HBM) (Rosenstock, 1988) and a Behavior Change Model (Godin, 1996)

Figure 4 Description of Health Belief Model Constructs



The Health Belief Model (HBM) (Rosenstack, 1988) is an appropriate theoretical framework for the design of this study survey, as the important investigator set out to examine the predictors to students' health-related action, which include the perceive severity, consequences, benefits , and perceive barriers and cues to HPV vaccination (Reynolds and O'Connell, 2011). And the outcome variables will be measures are HPV knowledge, perception, and vaccination and HPV uptake.

If parents of students don't believe there is any benefit for them to be vaccinated they will not pay attention and to have lower HPV vaccination intention, uptake, if they believe there have a positive outcome related vaccination then they will have a greater vaccination intention, uptake (Krawczyk, 2012). And other studies demonstrate how knowledge, attitudes can influence behavior change, including HPV vaccination uptake (Spleen, 2012)

A behavioral change model will complement the HBM in guiding the design of this study education intervention (Godin, 1996).

Figure 5 Major constructs of the Health Belief Model



The point aspects of this Behavior Change Model include health knowledge will affect positive attitude, will increase awareness, motivation, intention and uptake of a promote behavioral outcome. This model ties in nicely with the HBM, as the intervention will design with the aim to increase mothers' knowledge, positive perceptions, and develop decision-making skill and motivate HPV vaccination decisions.

Quantitative data measurement tools:

Data measurement tools include screening questionnaire, base line survey, and follow up surveys. The first follow-up will be conducted immediately after the intervention complete and the second follow-up will conducted three months after the intervention complete.

And the pre, post intervention surveys is follow the Carolina HPV Immunization Measurement and Evaluation (CHIME) Project (Reiter, 2009) (Ingledeue, 2004) ,Questions from Ramirez, J. E., Ramos 1997, Pelullo,2012, Bowyer,2013 , Gerend,2008, Gillison,2008, Ragin,2009.

Consultations will conduct with health experts, health providers, researchers and parents of students who join this study from Vietnam to collect advice on the design of all measurement tools. The survey is administer online using a website that is private and control by investigator. The HPV education content follows the parents who complete the survey.

The baseline, follow-up survey is used to measure the impact of the intervention.

About screening questionnaire, students will receive an email requesting that they will access the survey and must complete the survey. The baseline survey includes:

1. Social – Demographic
2. Family health history
3. HPV, HPV vaccine knowledge

The follow up surveys will administer after the intervention finish and 3 months later. The purpose of the follow up survey is to measure parents HPV knowledge and HPV vaccination intention and uptake after intervention.

The purpose of the first follow-up survey is to measure parents HPV knowledge, HPV intention immediately after receiving an HPV education program. The purpose of the second follow-up is to measure whether parents have sustained HPV vaccination intention after a sufficient the time when they have gone without intervention. The investigator use 3 months for the second follow-up because 3 months is not too long time so students mothers can remember the knowledge after receiving the educational intervention and can reduce parents drop out this study. The follow-up survey will be included 5 sections:

1. HPV Knowledge
2. Perception of HPV ,HPV vaccination
3. HPV vaccination Intention
4. HPV vaccine uptake
5. Comment and feedback

3.8 Study intervention

Participants in the control group were sent paper about the baseline survey (1. Social – Demographic, 2. Family health history 3. HPV, HPV vaccine knowledge with an altered ordering of the HPV and Cancer questions within each scale) by the researcher. Researcher and researcher's assistants will get survey form participants within 48 hours .

Participants in the intervention group were sent information paper about HPV knowledge the same baseline survey as the control group. After the baseline survey was sent, the participants in intervention group will be come to class for the training in Saturday and Sunday. The intervention participants will be learning HPV education training by power point presentation by health care provider.

An education HPV information series which is developed funny cartoon pictures and words by researcher .And Researcher discuss more with some mothers to develop the content of intervention. It is an easy way to let other mothers to understand HPV education information. These cartoon pictures, and some interesting questions on the content of the HPV information will motivate mothers prefer learning.

Researcher will give the presentation about HPV information education to the intervention group in Saturday and Sunday morning every week. Because researcher wants participants have more time to read HPV education information. In the PowerPoint will be created content information about HPV according to WHO and CDC and after presentation finish ,researcher will separate intervention group into small group for discussion and answer questions by voice related to HPV information .Before finish the first day of every class ,researcher will send booklet related to HPV information to parents .The booklet content will be created beautiful pictures ,words, and interesting questions that motivate parents to read and easy to share information to their child. After finish last day of education intervention, researcher will send to every parents paper of

questions related to HPV education intervention such as Socio-demographic, HPV knowledge, perceive threat, perceive severity, perceive benefit and perceive barriers .Every mothers will sit different table .Mothers of male students will write down answer in the paper .Researcher will collect the file that mothers of students and evaluate. Totally, spending 48 hours for every times intervention.

The intervention content was guided by information from the World Health Organization (WHO), the Public Health Agency of USA, the Centers for Disease Control and Prevention (CDC) and other reputable health-based websites, and from input of experts from USA and in Vietnam. It should also be noted that there was no mention of the two HPV vaccine brands or manufacturers, and there was a disclaimer at the bottom of each poster stating that this study was in no way affiliated with or linked to either drug manufacturer or HPV vaccine. The control group of parents received the poster series after the study finished.

In intervention groups will be divided into four groups .In intervention groups will be received questions from researcher at baseline .After baseline, every group will get HPV education intervention on Saturday or Sunday morning in 1 month .After 1 month, they will answer questions about HPV knowledge ,perceive thread ,severity ,barrier , benefit and intention from researcher .Then after 3 months later ,they will be received questions about HPV intention again .

Research assisstant include one medical doctor ,one nurse .Medical doctor will give participants power point presentation .And the nurse will take note by hand writing ,some time the nurse will have record .

Intervention content:

The first day: The researcher will give presentation in class.They will introduce about education program. Health care provider talk about what is HPV, type of HPV, how HPV transmitted to other people, HPV cause cancer in men and mention about story some case that had HPV infection . After presentation ,researcher will divide into 3 small groups for discussion part .And one

researcher assistant will run every small group .The small group will discuss about HPV education content that researcher present from power point . Every group will have discussion about knowledge that they learn and answer questions from researcher.

The second day: The researcher will give presentation about how to prevent HPV infection ,they will introduce 3 kinds of vaccine (Gardasil ,Gardasil 9 and Cervavix) to protect HPV type 6 ,11, especially type 16 and 18 .They mention more detail content of every kind of vaccine .They will show video about HPV vaccination program from WHO .Then health care provider will talk about benefit and side effect of HPV vaccination .After presentation ,every group will discuss together and answer questions from researcher .

The third day: Every group HPV will discuss all information that they learn from HPV education intervention with researcher and sharing ideas , experience of every people that they know about HPV education information .

The fourth day: Intervention groups will answer all questions from HPV education related HPV knowledge; perceive threat, severity, barrier, benefit and HPV intention after education intervention .

For second follow-up, after 3 months later. Researcher will ask both intervention group and control group for Vaccination intention .Researcher will ask will parents of students had vaccinated or not from two groups.

The control group mothers will receive the HPV information booklet after the study finish.

Researcher's assistant include 3 medical doctors to give presentation and 6 assistant to collect data, talk with mothers of boys students and take notes important points during education intervention and Iam will be researcher management.

3.9 Data Analysis

Data analysis the collected data will be analyzed using Statistical Package for the Social Sciences Version 22.0 (IBM Corp, Armonk, NY, USA).

Statistical tests are performed with 95% confidence interval (CI), p-value <0.05 is considered statistical significant.

Objective	Main Variables	Statistics name
To identify demographic factors associated with HPV knowledge among mothers of secondary school boys students.	Socio-demographic characteristics Age Religion Marital status Personal income Level of education Residence	Chi-square test
Compare General HPV knowledge at Baseline between control and intervention group	HPV knowledge Baseline	Chi-square test
Compare HPV knowledge between control and intervention group	HPV knowledge scale	Mann-Whitney U test
Compare agreement of benefit and barrier of HPV vaccine between control and intervention group	Benefit and barrier of HPV vaccination scale	Mann-Whitney U test Mann-Whitney U test

Objective	Main Variables	Statistics name
Compare Agreement of perceive threat of HPV between control and intervention group	Perceive threat of HPV infection scale	
Compare Agreement of perceive severity of HPV between control and intervention group	Perceive severity of HPV infection scale	Mann-Whitney U test
Compare HPV vaccination intention between intervention and control group	HPV intention scale	Chi-square test
Effect of knowledge to HPV vaccination intention between intervention and control group	HPV knowledge and intention scale	Mann-Whitney U tes
Effect of perception of barrier and benefit to HPV vaccination intention between intervention and control group	HPV perception of barrier and benefit scale to HPV vaccination intention scale	Mann-Whitney U test

Objective	Main Variables	Statistics name
Effect of perceive threat to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination	HPV perception of threat to HPV vaccination intention scale	Mann-Whitney U test
Effect of perceive severity to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination	HPV perception of severity to HPV vaccination intention scale	Mann-Whitney U test

3.10 Ethical consideration

All participants will be informed about the process of the study and voluntarily sign consent form before participating in this study.

Ethical approval was obtained from the Ethics Research Committee on Research Involving Human Research Subjects, Health Sciences Group from Hue Medical University, Vietnam (Appendix B).

All respondents' consent via mothers will be obtained following informing about the study objectives, procedures, benefits, risks by preserving participants rights to withdraw any time.

3.11 Benefits

Benefits of HPV Health talk education intervention program that participants can know more about HPV knowledge ,perceive thread ,severity .Since mothers ,they will pay more attention about HPV vaccination for their boys .And other benefit that mothers they know more about HPV vaccine is not only protect their boys from HPV infection related to cancer but only can bring a lot of benefit for girls .So girls can protect HPV infection from boys who had HPV vaccination .

3.12 Limitation

Purposive selection of the study population limits the generalizability of the study to the entire expat secondary school in Hue province. Researchers choose 2 secondary high schools that are not represent all mothers of male students characteristics.

There are some confounding factors may affect the outcome such as control group or intervention group will get some information about HPV from another source like internet ,TV ,newspaper and so on ...

CHAPTER IV

RESULTS

4.1 Social Demographic

We found no significant differences between both groups in terms of mothers' ages, ages of their children, income, level of education, and residence ($P>0.05$) except for marital status and religious beliefs ($P<0.05$) (Table 1).

Table 3 Sample Characteristics

Variables	Total ^a		Control		Intervention		p-value ^b
	Count	(%)	Count	(%)	Count	(%)	
Mother's age							0.263
31 - 40	136	48.7	64	46.4	72	51.1	
41 - 50	104	37.3	50	36.2	54	38.3	
51 - 60	39	14.0	24	17.4	15	10.6	
Marital status							< 0.001
Single	5	1.8	1	0.7	4	2.8	
Married	242	86.7	132	95.7	110	78.0	
Divorced	31	11.1	5	3.6	26	18.4	
Other	1	0.4			1	0.7	
Religious							0.033
Christian	3	1.1	3	2.2			
Buddhist	214	76.7	98	71.0	116	82.3	
Other	62	22.2	37	26.8	25	17.7	
Ages of son participating							0.591
11	64	22.9	28	20.3	36	25.5	
12	75	26.9	41	29.7	34	24.1	
13	72	25.8	37	26.8	35	24.8	
14	68	24.4	32	23.2	36	25.5	
Personal income per month							0.243
Under 5 million VN\$	25	9.0	9	6.5	16	11.3	
5 million to 10 million	143	51.3	69	50.0	74	52.5	
10 million VN\$ or more	111	39.8	60	43.5	51	36.2	
Level of education							0.166
Less than high school	16	5.7	8	5.8	8	5.7	
High school	47	16.8	23	16.7	24	17.0	
Bachelor degree	163	58.4	79	57.2	84	59.6	
Master degree	48	17.2	28	20.3	20	14.2	
Doctorate degree	5	1.8			5	3.5	
Residence							0.472
City	232	83.2	117	84.8	115	81.6	

Rural 47 16.8 21 15.2 26 18.4

4.2 Awareness and Attitudes at Baseline

Table 4 General HPV knowledge at Baseline

Items	Control	Intervention	Total ^a	p-value ^b
Do you know anything about HPV?				0.448
Yes	59 (42.8%)	54 (38.3%)	113 (40.5%)	
No	79 (57.2%)	87 (61.7%)	166 (59.5%)	
Have you ever heard of HPV vaccines?				0.380
Yes	44 (31.9%)	52 (36.9%)	96 (34.4%)	
No	94 (68.1%)	89 (63.1%)	183 (65.6%)	
Have you ever heard of penile cancer, or anal cancer in men?				0.111
Yes	95 (68.8%)	109 (77.3%)	204 (73.1%)	
No	43 (31.2%)	32 (22.7%)	75 (26.9%)	
Have you ever heard of genital warts in men?				0.679
Yes	9 (6.5%)	11 (7.8%)	20 (7.2%)	
No	129 (93.5%)	130 (92.2%)	259 (92.8%)	

At baseline, there were no significant differences found in both groups regarding their reports .(Table 4)

4.3 HPV knowledge

Table 5 Baseline HPV knowledge between control and intervention group

Item	Control (n = 138)	Intervention (n = 141)	Total	p
HPV is a sexually transmitted infection (T)				
Correct	109 (79.1%)	115 (81.6%)	224 (80.3%)	>0.05
Incorrect	3 (1.9%)	3 (2.1%)	6 (2%)	
Don't know	26 (19%)	23 (16.3%)	49 (17.7%)	
Men cannot get HPV (F)				
Correct	38 (27.2%)	35 (25.1%)	73 (26.2%)	>0.05
Incorrect	31 (22.7%)	30 (20.9%)	61 (21.8%)	
Don't know	69 (50.1%)	76 (54%)	146 (52%)	
There are many different types of HPV (T)				
Correct	95 (68.9%)	100 (71.3%)	195 (70.1%)	>0.05
Incorrect	2 (1.1%)	11 (7.5%)	13 (4.3%)	
Don't know	41 (30%)	30 (21.2%)	71 (25.6%)	
HPV can be transmitted through oral sex (T)				
Correct	63 (45.5%)	66 (46.6%)	129 (46.1%)	>0.05
Incorrect	5 (3.5%)	11 (8.1%)	16 (5.8%)	
Don't know	70 (51%)	64 (45.3%)	134 (48.1%)	
HPV infection can cause Oropharyngeal cancer (T)				
Correct	35 (25.5%)	39 (27.5%)	74 (26.5%)	>0.05
Incorrect	21 (15%)	23 (16.5%)	44 (15.8%)	
Don't know	82 (59.5%)	79 (56%)	161 (57.7%)	
HPV infection can cause genital warts in boys (T)				
Correct	24 (17.1%)	24 (17%)	48 (17.1%)	>0.05
Incorrect	30 (21.9%)	32 (22.5%)	62 (22.2%)	
Don't know	84 (61%)	85 (60.5%)	169 (60.7%)	
HPV infection can cause penile cancer in boys (T)				
Correct	15 (10.6%)	15 (11%)	30 (10.8%)	>0.05
Incorrect	97 (70.3%)	101 (71.5%)	198 (70.9%)	
Don't know	26 (19.1%)	25 (17.5%)	51 (18.3%)	
The HPV vaccine protects your sons from some types of HPV (T)				
Correct	70 (51%)	71 (50%)	141 (50.5%)	>0.05
Incorrect	37 (27%)	21 (15%)	58 (21%)	
Don't know	31 (22%)	49 (35%)	80 (28.5%)	

Item	Control (n = 138)	Intervention (n = 141)	Total	p
The HPV vaccine is most effective for those who have not had sexual intercourse (T)				
Correct	83 (60.1%)	86 (61%)	169 (60.6%)	>0.05
Incorrect	17 (12.7%)	19 (13.5%)	36 (13.1%)	
Don't know	38 (27.2%)	36 (25.5%)	74 (26.3%)	

There were no different HPV knowledge between intervention and control group during baseline test ($p > 0.05$)

HPV education intervention after 1 month receiving education intervention

Table 6 Median score of HPV knowledge between two groups after receiving education
Assumption: T: correct = 1, incorrect = don't know = 0; F: incorrect = 1, correct = don't know = 0

Item	Group	n	Median	p value ^a
HPV knowledge	Control	138	4	$p < 0.001$
	Intervention	141	8	
	Total	279	7	

In intervention groups, HPV knowledge score was much higher compare to control group who didn't receive HPV education ($p < 0.001$). The HPV knowledge of intervention group had median score higher than control group 7 scores.

4.4 Perception towards Benefit and Barriers of HPV Vaccine

Table 7 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)

Items	Control (n = 138)	Intervention (n = 141)	p-value ^b
-------	----------------------	---------------------------	----------------------

	Mean^a	Mean^a	
I believe HPV vaccinations are beneficial to the male population(T)	3.62	4.40	< 0.001
A benefit to becoming vaccinated is that it will protect my son against HPV(T)	3.67	4.29	< 0.001
I think HPV vaccine protects my son against certain oropharyngeal cancer from HPV infection(T)	3.41	4.23	< 0.001
I believe HPV vaccine protects against genital Warts(T)	3.71	4.28	< 0.001
Boys can obtain the HPV vaccine(T)	3.72	4.50	< 0.001
I believe HPV vaccinations are only beneficial for Females(F)	2.99	1.70	< 0.001
I do not feel there are any benefits to becoming Vaccinated(F)	2.51	1.55	< 0.001
HPV vaccine may have side effects(T)	3.39	4.39	< 0.001
HPV vaccine is safe(T)	3.45	4.08	< 0.001
The HPV vaccine for male is still new , so I need time before deciding if my son should get it(F)	3.50	2.10	< 0.001
It is unlikely that my child will get HPV in the Future(F)	2.98	1.96	< 0.001
It is unlikely that my child will get an anogenital cancer (ie. penile, anal cancer) in the future(T)	3.09	3.65	< 0.001

^a1- Strongly disagree, 2- Disagree, 3- Unsure, 4- Agree, 5- Strongly agree, not all of the 288 mothers answered the questions

Perception of benefit and barriers of HPV vaccine between intervention and control group were significant differences ($P < 0.001$)

4.5 Perceive threat of HPV infection

Table 8 Perceive threat of HPV infection

Agreement of perceive threat of HPV between control and intervention group (mean)

Items	Control	Intervention	p-value ^b
	(n = 138) Mean ^a	(n = 141) Mean ^a	
Both men and women can get oropharyngeal cancer from HPV infection	2.15	4.52	< 0.001
Having an HPV infection increases the risk of getting oropharyngeal cancer	2.41	4.48	< 0.001
Had many sexual partners and possibly at high risk for HPV infection	2.14	4.07	< 0.001

^a1- Strongly disagree, 2- Disagree, 3- Unsure, 4- Agree, 5- Strongly agree, not all of the 288 mothers answered the questions

The intervention group have higher mean scores agreement about perceive threat of HPV than control group ($p < 0.001$)

4.6 Perceive severity of HPV infection

Table 9 Perceive severity of HPV infection

Agreement of perceive severity of HPV between control and intervention group (mean)

Items	Control	Intervention	p-value ^b
	(n 138)	(n = 141)	
	Mean ^a	Mean ^a	
I feel that HPV is a serious infection for my son to contract	2.32	4.33	< 0.001
I feel that oropharyngeal cancer/penile and anal cancer is a serious disease for my son to develop	3.46	4.43	< 0.001
I feel that genital warts are a serious disease for my son to develop	2.50	4.00	< 0.001

The intervention group have higher agreement about perceive severity of HPV than control group (p<0.001)

4.7 HPV vaccination intention

Table 10 vaccination intention

Items	Control n (%)	Intervention n (%)	Total n (%)	p value ^a
HPV vaccination intention				
Yes	74 (53.6)	126 (89.4)	200 (71.7)	p < 0.001
No	64 (46.4)	15 (10.6)	79 (28.3)	

The HPV vaccination intention between two groups were significant different (p<0.001), with intervention group intention was much higher (89.4%) than control group(53.6%)

Table 11 Effect of knowledge to HPV vaccination intention between intervention and control group (Yes)

Group	HPV knowledge		
	n	Median	p value ^a
Intervention	126	8	p < 0.001
Control	74	4	

Combine with table 1 (HPV vaccination intention table) .The intervention group had higher HPV knowledge compare to control group among mothers intended to give their child vaccination .

Among mothers intended to give their child vaccination in both groups. The intervention group had mean scores of HPV knowledge higher than control group is 4 scores .

Table 12 Effect of perception of barrier and benefit to HPV vaccination intention between intervention and control group (Yes)

Group	Benefit & Barrier score of agreement			
	n	Mean	SD	p value^a
Intervention	126	55.96	4.82	p < 0.001
Control	74	46.5	4.93	

Combine with table 1 (HPV vaccination intention table) . The intervention group had the higher agreement about barrier and benefit to HPV vaccination and the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

Table 13 Effect of perceive threat to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination

Group	Agreement					p value ^a
	Strongly disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly agree n (%)	
Both men and women can get oropharyngeal cancer from HPV infection						
Intervention	4 (3.2)	1 (0.8)	9 (7.1)	23 (18.3)	89 (70.6)	p < 0.001
Control	30 (40.5)	20 (27.0)	11 (14.9)	9 (12.2)	4 (5.4)	
Having an HPV infection increases the risk of getting oropharyngeal cancer						
Intervention		1 (0.8)	18 (14.3)	24 (19.0)	83 (65.9)	p < 0.001
Control	22 (29.7)	18 (24.3)	20 (27.0)	11 (14.9)	3 (4.1)	
Had many sexual partners and possibly at high risk for HPV infection						
Intervention	2 (1.6)	5 (4.0)	34 (27.0)	22 (17.5)	63 (50.0)	p < 0.001
Control	28 (37.8)	26 (35.1)	7 (9.5)	9 (12.2)	4 (5.4)	

Combine with table 1 (HPV vaccination intention table) .The intervention group had the higher agreement about perceive threat of HPV vaccination and the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

Table 14 Effect of perceive severity to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination

Group	Agreement					p value ^a
	Strongly disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly agree n (%)	
I feel that HPV is a serious infection for my son to contract						
Intervention			28 (22.2)	22 (17.5)	76 (60.3)	p < 0.001
Control	22 (29.7)	20 (27.0)	21 (28.4)	9 (12.2)	2 (2.7)	
I feel that oropharyngeal cancer/ penile and anal cancer is a serious disease for my son to develop						
Intervention		1 (0.8)	24 (19.0)	13 (10.3)	88 (69.8)	p < 0.001
Control		9 (12.2)	34 (45.9)	14 (18.9)	17 (23.0)	
I feel that genital warts are a serious disease for my son to develop						
Intervention	1 (0.8)	5 (4.0)	46 (36.5)	15 (11.9)	59 (46.8)	p < 0.01
Control	17 (23.0)	20 (27.0)	27 (36.5)	6 (8.1)	4 (5.4)	

Combine with table 1 (HPV vaccination intention table) .The intervention group had the higher agreement about perceive severity of HPV vaccination, the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

HPV education intervention 3 months after first follow up

4.8 HPV knowledge at the second follow up

Table 15 Median score of HPV knowledge between control and intervention group

Item	Group	n	Median	p value^a
HPV knowledge	Control	138	4	p < 0.001
	Intervention	141	8	
	Total	279	7	

In intervention groups, HPV knowledge score was much higher compare to control group who didn't receive HPV education (p<0.001)

4.9 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)

Table 16 Compare agreement of benefit and barrier of HPV vaccine between control and intervention group (mean)

Items	Control (n = 138)	Intervention (n = 141)	p value ^b
	Mean ^a	Mean ^a	
I believe HPV vaccinations are beneficial to the male population (T)	3.66	4.42	p < 0.001
A benefit to becoming vaccinated is that it will protect my son against HPV (T)	3.69	4.36	p < 0.001
I think HPV vaccine protects my son against certain oropharyngeal cancer from HPV infection (T)	3.46	4.26	p < 0.001
I believe HPV vaccine protects against genital warts (T)	3.75	4.30	p < 0.001
Boys can obtain the HPV vaccine (T)	3.75	4.54	p < 0.001
I believe HPV vaccinations are only beneficial for females (F)	3.07	1.73	p < 0.001
I do not feel there are any benefits to becoming vaccinated (F)	2.49	1.57	p < 0.001
HPV vaccine may have side effects (T)	3.46	4.43	p < 0.001
HPV vaccine is safe (T)	3.50	4.13	p < 0.001
The HPV vaccine for male is still new , so I need time before deciding if my son should get it (F)	3.50	2.21	p < 0.001
It is unlikely that my child will get HPV in the future (F)	3.07	2.04	p < 0.001
It is unlikely that my child will get an anogenital cancer (ie. penile, anal cancer) in the future (T)	3.15	3.72	p < 0.001

^a1-strongly disagree, 2-disagree, 3-unsure, 4-agree, 5-strongly agree

Perception of benefit and barriers of HPV vaccine between intervention and control group were significant differences ($P < 0.001$)

4.10 Perceive threat of HPV infection

Table 17 Agreement of perceive threat of HPV between control and intervention group (mean)

Items	Control	Intervention	p-value ^b
	(n = 138) Meana	(n = 141) Meana	
Both men and women can get oropharyngeal cancer from HPV infection	2.61	4.65	< 0.001
Having an HPV infection increases the risk of getting oropharyngeal cancer	2.86	4.70	< 0.001
Had many sexual partners and possibly at high risk for HPV infection	2.72	4.28	< 0.001

^a1- Strongly disagree, 2- Disagree, 3- Unsure, 4- Agree, 5- Strongly agree

The intervention group have higher agreement about perceive threat of HPV than control group ($p < 0.001$)

4.11 Perceive severity of HPV infection

Table 18 Agreement of perceive severity of HPV between control and intervention group (mean)

Items	Control	Intervention	p-value ^b
	(n = 138)	(n = 141)	
	Mean ^a	Mean ^a	
I feel that HPV is a serious infection for my son to contract	2.88	4.41	< 0.001
I feel that oropharyngeal cancer/penile and anal cancer is a serious disease for my son to develop	3.47	4.60	< 0.001
I feel that genital warts are a serious disease for my son to develop	2.91	4.11	< 0.001

^a1- Strongly disagree, 2- Disagree, 3- Unsure, 4- Agree, 5- Strongly agree, not all of the 288 mothers answered the questions

The intervention group have higher agreement about perceive severity of HPV than control group (p<0.001)

4.12 HPV vaccination intention

Table 19 HPV vaccination intention

Items	Control n (%)	Intervention n (%)	Total n (%)	p value ^a
HPV vaccination intention				
Yes	81 (58.7)	129 (91.5)	210 (75.3)	p < 0.001
No	57 (41.3)	12 (8.5)	69 (24.7)	

The HPV vaccination intention between two groups were significant different ($p < 0.001$), with intervention group intention was much higher (91.5%) than control group (58.7%)

Table 20 Effect of knowledge to HPV vaccination intention between intervention and control group(Yes)

Group	HPV knowledge		
	n	Median	p value ^a
Intervention	129	8	p < 0.001
Control	81	4	

Combine with table 1 (HPV vaccination intention table) .The intervention group had higher HPV knowledge compare to control group among mothers intended to give their child vaccination .

Among mothers intended to give their child vaccination in both groups. The intervention group had mean scores of HPV knowledge higher than control group is 4 scores .

Table 21 Effect of perception of barrier and benefit to HPV vaccination intention between intervention and control group (Yes)

Group	Benefit & Barrier score of agreement			
	n	Mean	SD	p value ^a
Intervention	129	56.05	4.67	p < 0.001
Control	81	46.85	4.62	

Combine with table 1 (HPV vaccination intention table) . The intervention group had the higher agreement about barrier and benefit to HPV vaccination and the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

Table 22 Effect of perceive threat to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination

Group	Agreement					p value ^a
	Strongly disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly agree n (%)	
Both men and women can get oropharyngeal cancer from HPV infection						
Intervention			14 (10.9)	20 (15.5)	95 (73.6)	p < 0.001
Control	19 (23.5)	21 (25.9)	21 (25.9)	9 (11.1)	11 (13.6)	
Having an HPV infection increases the risk of getting oropharyngeal cancer						
Intervention			6 (4.7)	25 (19.4)	98 (76.0)	p < 0.001
Control	29 (35.8)	10 (12.3)	10 (12.3)	12 (14.8)	20 (24.7)	
Had many sexual partners and possibly at high risk for HPV infection						
Intervention		5 (3.9)	26 (20.2)	23 (17.8)	75 (58.1)	p < 0.001
Control	19 (23.5)	19 (23.5)	16 (19.8)	12 (14.8)	15 (18.5)	

Combine with table 1 (HPV vaccination intention table) .The intervention group had the higher agreement about perceive threat of HPV vaccination, the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

Table 23 Effect of perceive severity to HPV vaccination intention between intervention and control group among mothers intended to give their child vaccination

Group	Agreement					p value ^a
	Strongly disagree n (%)	Disagree n (%)	Unsure n (%)	Agree n (%)	Strongly agree n (%)	
I feel that HPV is a serious infection for my son to contract						
Intervention			27 (20.9)	18 (14.0)	84 (65.1)	p < 0.001
Control	14 (17.3)	21 (25.9)	23 (28.4)	17 (21.0)	6 (7.4)	
I feel that oropharyngeal cancer/ penile and anal cancer is a serious disease for my son to develop						
Intervention			19 (14.7)	12 (9.3)	98 (76.0)	p < 0.001
Control	1 (1.2)	11 (13.6)	34 (42.0)	16 (19.8)	19 (23.5)	
I feel that genital warts are a serious disease for my son to develop						
Intervention		5 (3.9)	43 (33.3)	15 (11.6)	66 (51.2)	p < 0.01
Control	5 (6.2)	20 (24.7)	39 (48.1)	11 (13.6)	6 (7.4)	

Combine with table 1 (HPV vaccination intention table) .The intervention group had the higher agreement about perceive severity of HPV vaccination, the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

CHAPTER V

DISCUSSION

5.1 Discussion

This study also explored whether knowledge and perception had an influence on vaccination intention. The results of this trial intervention provide evidence

to support the creation of a confirmatory study to test the Health talk HPV educational program among a larger study sample.

5.1.1 Socio-demographic characteristics

This study population was categorized into three age groups, mothers of secondary school boys students are between 31 to 60 years of age. The age of this study population is consistent with other HPV educational and intervention studies which were aimed at measuring mothers' knowledge, attitudes, perceptions and health-related behavior regarding HPV and their child. The median household income from the study population was 5 million/month and more ; however a great portion of the study population had an even greater personal income with 111 parents (39.8%) who reported a personal income >10 million vnd /month, and 143 parents (51.3%) reported an personal income 5 to 10 million vnd /month. Only 25 parents (9%) had income lower than 5 million vnd/month. At this time, being there are no other expat studies to compare these data to, it is difficult to assess whether this is an accurate representation of expats socio-economic status; however, it is highly unlikely that this is an accurate representation of all mothers living in Vietnam. Although these sociodemographic data did not have statistically significant relationships with parents' vaccination intention, it would be recommended to explore these factors further, as other studies report that a higher level of parental education is associated with preventative health-related behavior (Meschke, 2002; Brabin et al., 2004).

5.1.2 Knowledge of HPV and the HPV vaccine

The first objective of this study was to measure mothers of secondary school boys students knowledge of HPV and the HPV vaccine.

There were no statistically significant differences found between the control group and test group at the baseline regarding their reports. These data reveal that both groups did not have many HPV knowledge across survey periods. In order to stop the test group from seeking information from other sources, we chosen purposive the study population into control group and intervention group immediately after the baseline survey was collected, and the test group started to receive the study educational intervention.

5.1.3 Perception of HPV and the HPV vaccine

The second study objective is to measure mothers of secondary school boys students perception of HPV and the HPV vaccine.

A series of comparisons were conducted to determine any differences between the mean scores for the control group and test group on the overall perception scale and subscales.

The first follow up , The intervention group have higher agreement about perceive threat of HPV than control group ($p < 0.001$) and The intervention group have higher agreement about perceive severity of HPV than control group ($p < 0.001$)

The second follow up The intervention group have higher agreement about perceive threat of HPV than control group ($p < 0.001$) and The intervention group have higher agreement about perceive severity of HPV than control group ($p < 0.001$)

Regarding the attitudes towards benefit and barriers of HPV vaccine, The first follow up there are significant differences between the control and intervention group ($P < 0.001$).

There was a clear trend in the study data, regardless of parents' allocation to the test group or control group, mothers of secondary school boys students

who reported a more positive perception of agreement of benefit and barrier of HPV vaccine. Studies have found that parents who have access to HPV education and information, if vaccinations are provided free and in a convenient location, and if they are provided with regular and diligent follow-up and medical support, this reduces some of the barriers to HPV vaccination intention and uptake (Brabin, 2006). As with findings from other studies, a positive perception of the vaccine efficacy and safety was reported as an influence in parents' positive HPV vaccination intention (Brewer and Fazekas, 2007). This is explained by several studies that have found that parents who are unclear and uncertain or lack knowledge about the HPV vaccine often have serious misconceptions that generate fear of vaccine safety and efficacy which in turn lowers vaccination intention and uptake. On the other hand, studies have found that parents who trust the safety and efficacy of the HPV vaccine often have higher HPV vaccination intention and uptake (Reynolds and O'Connell, 2011).

The research done by Krawczyk et al. has also showed that "these theoretically motivated constructs are very useful for targeting interventions to increase vaccination intention and uptake among a male population" (Krawczyk, 2015). With their approval of giving vaccination for their sons, most parents thought that it would bring them benefits and believed that the vaccine is safe and that "without the HPV vaccine their son would be at risk of diseases related to HPV".

5.1.4 Vaccination intention

The third objective of this study was to measure HPV vaccination intention and assess whether knowledge or perception had an influence on intention. , mothers of secondary school boys students were asked to declare their intentions to vaccinate their children at each survey period. This proportion remained relatively constant during the second follow-up survey.

Among mothers intended to give their child vaccination in both groups. The more mothers who had higher HPV knowledge the more mothers who

intended to give their child HPV vaccination. The intervention group had higher HPV knowledge compare to control group among mothers intended to give their child vaccination.

About perceiver threat of HPV vaccination .The intervention group had the higher agreement about perceive threat of HPV vaccination and the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

About perceiver severity of HPV vaccination. The intervention group had the higher agreement about perceive severity of HPV vaccination, the more mothers had HPV vaccination intention compare to control group among mothers intended to give their child vaccination .

This result remained relatively constant during the second follow-up survey.

5.2 Recommendations

There are several notable limitations in this study, of which recommendations are made to address in future studies. First, purposive selection of the study population limits the generalizability of the study to the entire mothers community in Thua Thien Hue province, Vietnam .

This is especially problematic as the sample may be representative of only mothers of boys students who are interested in learning about sexual health. Furthermore, the sample may only be representative of a specific social class and parents that belong to the expat networks within which the study advertisement was circulated.

The sample size was small which makes it difficult for these study data to accurately describe the knowledge, perception, vaccination intention and mothers of boys students living in Thua Thien Hue province, Vietnam .

The advantages of having a small sample were that it enabled a study that was quicker to conduct, recruiting mothers, reviewing mothers responses to surveys, performing analyses and ensuring a low drop out rate. Furthermore, conducting a study with a small sample size was appropriate to test a new hypothesis in a population that has not been explored in other studies, to date. The small sample size was feasible in that there was not an abundance of resources required (time and financial costs) to determine whether there was an effect between the educational intervention and expats' level of HPV knowledge, perception, vaccination intention and uptake. Being that we found an association and an effect of the educational intervention, it is now recommended that a larger confirmatory study is needed.

Limitation of the study:

Health talk education is not enough for HPV vaccination intention .Because most of mothers believe Health care provider however some of others prefer information from other sources . And this study didn't analyze other aspect of how to access HPV vaccine such as need access intention of vaccination more than one questionnaire of HPV vaccine intention and just analyze mothers who could pay for Vaccination.

And other limitation is that only question about intention is not enough .

Strengths of the study:

This is the first study to assess the effectiveness of a Health Talk education program on HPV knowledge, perception, and vaccination intention among mothers of teenage boys in an Asian country. Researcher use simple random by computer to pick mothers of males students join this study to avoid the bias selection.

This study is expected to provide important information to policy makers and health professionals on how important HPV Health Talk education is, and that HPV vaccination is not only justified for girls but also for boys.

5.3 Conclusion

Overall, these study findings suggest that mothers of secondary school students who have a higher level of knowledge and understanding of the perceived susceptibility, severity and consequences of HPV, and the benefits and barriers to getting the HPV vaccine have a higher vaccination intention. This intervention and others should aim to address some of the salient factors that influence knowledge, perception, vaccination intention and uptake, which were revealed in this study will include information on HPV transmission, prevention and health effects, and HPV vaccine efficacy, safety and potential side effects.

REFERENCE

1. Abhyankar ,O'Connor DB ,Lawton.The role of message framing in promoting MMR vaccination: evidence of a loss-frame advantage. *Psychol Health Med* 2008;13:1-16.
2. Akiko Kamimura, Ha N.Trinh, Shannon Weaver Knowledge and beliefs about HPV among college students in Vietnam and the United States. *Journal of infection and public health* 2018; 11:120-125.
3. AlainaT .Bennett ,Diyya A.Patel ,Ruth C.Carlos. Human Papillomavirus Vaccine Uptake After a Tailored, Online Educational Intervention for Female University Students: A Randomized Controlled Trial. *J Womens Health* 2015; 24: 950–957.
4. Allen JD, Fantasia HC, Fontenot H, et al. College men's knowledge, attitudes, and beliefs about the human papillomavirus infection and vaccine. *J Adolesc Health* 2009; 45:535-7.
5. American Association for Cancer Research, Cosponsored by the American Society of Preventive Oncology 2012; 20: 172–82.
6. An, J.-K. Lee, H.V. Minh, N.T. Trang immunization completion among children in Vietnam from 2000 to 2011: a multilevel analysis of individual and contextual factors. *Glob Health Action* 2016;116-212.
7. Anh PTH, Hieu NT, Herrero R,Vaccarella S, Smith JS, Thuy NT, et al. Human papillomavirus infection among women in South and North Vietnam. *Int J Cancer* 2003; 104: 213–292.
8. Bach Xuan Tran ,Phung Tat Quoc Than. Knowledge, attitude, and practice on and willingness to pay for human papillomavirus vaccine: a cross-sectional study in Hanoi, Vietnam. *Patient Prefer Adherence* 2018; 12: 945–954.
9. Basu P, Mittal S. Acceptability of human papillomavirus vaccine among the urban, affluent and educated parents of young girls residing in Kolkata, Eastern India. *J Obstet Gynaecol Res* 2011; 37: 393–401.

10. Brabin, L., Roberts, S.A., Faraneh, F. and Kitchener, H.C. Future acceptance of adolescent human papillomavirus vaccination: a survey of parental attitudes. *Vaccine* 24 (2006): 3087-3094.
11. Bleeker MCG, Heideman DAM, Snijders PJF, Horenblas S, Dillner J, Meijer CJLM. Penile cancer: epidemiology, pathogenesis and prevention. *World J Urol* 2009; 27:141-150.
12. Boehner, C., Howe, S., Bernstein, D., & Rosenthal, S. Viral sexually transmitted disease vaccine acceptability among college students. *Sexually Transmitted Diseases* 2010; 30:774-8.
13. Bosch, F. X., Lorincz, A., Munoz, N., Meijer, C. J. L. M., Shah, K. V. The causal relation between human papillomavirus and cervical cancer. *British Medical Journal* 2002; ;55:244-65.
14. Bowyer, H. L., Marlow, L. a V, Hibbitts, S., Pollock, K. G., & Waller, J. (2013). Knowledge and awareness of HPV and the HPV vaccine among young women in the first routinely vaccinated cohort in England. *Vaccine* 2013; 31:1051-6.
15. Brabin L, Roberts SA, Farzaneh F, Kitchener HC. Future acceptance of adolescent human papillomavirus vaccination: a survey of parental attitudes. *Vaccine* 2006; 24:3087-94.
16. Brewer, N.T., Gottlieb, S.L., Reiter, P.L., et al. Longitudinal predictors of human papillomavirus vaccine intention among adolescent girls in a high-risk geographic area. *Sex Transm Dis* 2011 38: 197-204.
17. Brewer, N.T. and Fazekas, K.I. Predictors of HPV vaccine acceptability: A theory-informed, systematic review. *Preventive Medicine* 45 (2007): 107-114.
18. Bruni L, Barrionuevo-Rosas L, Albero G, ICO information centre on HPV and cancer (HPV information centre). Human papillomavirus and related diseases in Viet Nam. Summary Report 2014; 202:12-18.

19. Bruni, L., Diaz, M., Castellsagué, X., Ferrer, E., Bosch, F. X., & de Sanjosé, S. (2010). Cervical human papillomavirus prevalence in 5 continents: meta-analysis of 1 million women with normal cytological findings. *The Journal of Infectious Diseases* 2012; 202: 1789–1799.
20. Centers for Disease Control and Prevention (CDC). (2012). Human papillomavirus associated cancers-United States, 2004-2008. *MMWR Recommendations and Reports* 2012; 61, 258-61.
21. Chan SS, Cheung TH, Lo WK, Chung TK. Women's attitudes on human papillomavirus vaccination to their daughters. *J Adolesc Health* 2007; 41:204–7.
22. D'Souza G, Gross ND, Pai SI, et al. Oral human papillomavirus (HPV) infection in HPV-positive patients with oropharyngeal cancer and their partners. *J Clin Oncol* 2014 32: 2408-2415.
23. Davis K, Dickman ED, Ferris D, Dias JK. Human papillomavirus vaccine acceptability among parents of 10- to 15-year-old adolescents. *J Low Genit Tract Dis* 2004; 8:188–94.
24. Dawar, M., Dobson, S., & Deeks, S. Literature review on HPV 6, 11, 16 and 18: Disease and Vaccine Characteristics 2007; 92: 1-33.
25. Dempsey AF, Zimet GD, Davis RL, and Koutsky L. Factors that are associated with parental acceptance of human papillomavirus vaccines: a randomized intervention study of written information about HPV. *Pediatrics* 2006; 117:1486–93.
26. Dinh TA, Rosenthal SL, Doan ED. Attitudes of mothers in Da Nang, Vietnam toward a human papillomavirus vaccine. *J Adol Health*.2007; 40, 559-63.
27. Doherty K, Low KG. The effects of a web-based intervention on college students' knowledge of human papillomavirus and attitudes toward vaccination. *Int J Sex Health* 2008; 20:223–32.

28. Doherty, K. & Graff Low, K.G. The effects of a web-based intervention on college students' knowledge of human papillomavirus and attitudes toward vaccination. *International Journal of Sexual Health* 2008; 20:223-232.
29. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *Int J Cancer* 2010;127:2893–2917.
30. Francis SA, Nelson J, Liverpool J, Soogun S, Mofammere N, Thorpe RJ. Examining attitudes and knowledge about HPV and cervical cancer risk among female clinic attendees in Johannesburg, South Africa. *Vaccine* 2010; 28:8026-32.
31. Farias AJ, Savas LS, Fernandez ME, et al. Association of physicians perceived barriers with human papillomavirus vaccination initiation. *Prev Med.* 2017;105:219–225.
32. G.B. Asiedu, C.R. Breitkopf, W.K. Kremers, Q.V. Ngo, N.V. Nguyen, B.J.Barenberg, *et al.* Vietnamese health care providers' preferences regarding recommendation of HPV vaccines. *Asian Pac J Cancer Prev* 2015 ;16:4895-900.
33. Gainforth, H. L., Cao, W., & Latimer-Cheung, A. E. Determinants of human papillomavirus (HPV) vaccination intent among three Canadian target groups. *Journal of Cancer Education* 2012; 27:717-24.
34. Galagan SR, Paul P, Menezes L, LaMontagne DS. Influences on parental acceptance of HPV vaccination in demonstration projects in Uganda and Vietnam. *Vaccine* 2013; 31:3072–8.
35. Garland SM, Steben M, Sings HL, James M, Lu S, Railkar R, Barr E, Haupt RM, and Joura EA. Natural history of genital warts: Analysis of the placebo arm of 2 randomized phase III trials of a quadrivalent human papillomavirus (types 6, 11, 16, and 18) vaccine. *J Infect Dis* 2009; 199:805–814.

36. Gerend MA, Shepherd JE. Behavioral frequency moderates the effects of message framing on HPV vaccine acceptability. *Ann Behav Med* 2008; 35:221-9.
37. Gerend, M. a, & Magloire, Z. F. Awareness, knowledge, and beliefs about human papillomavirus in a racially diverse sample of young adults. *The Journal of Adolescent Health* 2012 ;42: 237–42.
38. Gilkey, M. B., Magnus, B. E., Reiter, P. L., McRee, A. L., Dempsey, A. F., & Brewer, N. T. The Vaccination Confidence Scale: a brief measure of parents' vaccination beliefs. *Vaccine*, 2014; 32:6259-65.
39. Gillison ,M.L ., Chaturvedi ,A.K,Lowy ,D.R.HPV prophylactic vaccines and the potential prevention of non cervical cancers in both men and women .*Journal of cancer* 2008;15:3036-46 .
40. Gillison, M. L., Broutian, T., Pickard, R. K. L., Tong, Z., Xiao, W., Kahle, L, Chaturvedi, A. K. Prevalence of oral HPV infection in the United States, 2009-2010. *JAMA : The Journal of the American Medical Association* 2012; 207: 693– 703.
41. Gillison, ML, Chaturvedi, AK, Anderson, WF, and Fakhry, C. Epidemiology of human papillomavirus-positive head and neck squamous cell carcinoma. *J Clin Oncol* 2015; 33: 3235–3242.
42. Gissman, L., Wolnik, L., Ikenberg, H., Koldovsky, U., Schnurch, H., Hausen, H. Human papillomavirus types 6 and 11 DNA sequences in genital and laryngeal papillomas and in some cervical cancers. *Medical Sciences* 1983; 80: 560–563.
43. Giuliano AR, Lee JH, Fulp W, et al. Incidence and clearance of genital human papillomavirus infection in men (HIM): a cohort study. *Lancet* 2011; 377:932–40.
44. Giuliano, A.R., Salmon, D. The case for a gender-neutral (universal) human papillomavirus vaccination policy in the United States. *Cancer, Epidemiology, Biomarkers & Prevention* 2008; 17:805-808.

45. Godin G, Kok G: The theory of planned behavior: a review of its applications to health-related behaviors. *American Journal of Health Promotion* 1996; 11:87-98.
46. Gullatte, M. The influence of spirituality and religiosity on breast cancer screening delay in African American women: Application of the theory of reasoned action and planned behavior. *The ABNF Journal* 2006; 17:89-94.
47. Harold zur Hausen Biographical .Nobel Prizes and Laureates .(Accessed April 13 ,2016)
48. Holman, D. M., Benard, V., Roland, K. B., Watson, M., Liddon, N., & Stokley, S. Barriers to human papillomavirus vaccination among US adolescents: a systematic review of the literature. *JAMA Pediatric* 2014; 168: 76–82.
49. Hutchinson DJ, Klein KC. Human papillomavirus disease and vaccines. *AM J Health-Syst Pharm* 2008; 65:2105–2112.
50. Ingledue, K., Cottrell, R., & Bernard, A. College women’s knowledge, perceptions, and preventative behaviors regarding human papillomavirus infection and cervical cancer. *American Journal of Health Studies* 2004; 19: 28–34.
51. Jones M, Cook R. Intent to receive an HPV vaccine among university men and women and implications for vaccine administration. *Journal of American College Health* 2008; 57:23–32.
52. Kaljee LM, et al. Parent-youth communication and concordance between parents and adolescents on reported engagement in social relationships and sexually intimate behaviors in Hanoi and Khanh Hoa province, Vietnam. *J Adolesc Health*. 2011;48(3):268–74.
53. Kennedy A, Sapsis KF, Stokley S, Curtis CR, Gust D. Parental attitudes toward human papillomavirus vaccination: evaluation of an educational intervention, 2008. *J Health Commun* 2011; 16:300–13.

54. Kepka D, Coronado GD, Rodriguez HP, Thompson B. Evaluation of a radionovela to promote HPV vaccine awareness and knowledge among Hispanic parents. *J Community Health* 2011; 36:957–65.
55. Krawczyk A, Knauper B, Gilca V, Dube E, Perez S, Joyal-Desmarais K, et al. Parents' decision-making about the human papillomavirus vaccine for their daughters: I. Quantitative results. *Hum Vaccin Immunother* 2015; 11:322-9.
56. Krawczyk A, Lau E, Perez S, Delisle V, Amsel R, Rosberger Z. How to inform: comparing written and video education interventions to increase human papillomavirus knowledge and vaccination intentions in young adults. *J Am Coll Health* 2012; 60:316–22.
57. Lambert EC. College students' knowledge of human papillomavirus and effectiveness of a brief educational intervention. *The Journal of the American Board of Family Practice* 2001; 14:178-83.
58. Lan Anh Thi Do ,Pimpawun Boonmonkon . 'Hu Hong' (bad thing): parental perceptions of teenagers' sexuality in urban Vietnam. *BMC Public Health* 2017; 17: 226.
59. Lan Vu MD, MSc, PhD, Ha Le MPH, Oanh Luong MD, MPH, Prevalence of Cervical Human Papillomavirus Infection Among Married Women in Hanoi, Vietnam, 2010 , *Asian Pacific Journal of Public Health* 2011;16: 385-390.
60. Loi TT, Nhung BTH. Screening cervical cancer of perimenopausal women in Ho Chi Minh City. *HCMH J Med.*2004; 8, 116-9.
61. Lee Mortensen G, Adam M, Idtaleb L. Parental attitudes towards male human papillomavirus vaccination: a pan-European cross-sectional survey. *BMC Public Health* 2015; 15:624-10
62. Lenehan, J., Leonard, K., Nadra, S., Isaacs, C., Mathew, A., Fischer, W. (2008). Women's knowledge, attitudes, and intentions concerning human papillomavirus vaccination: findings of a waiting room survey of obstetrics-gynaecology outpatients. *Journal of Obstetrics & Gynasecology Canada* 2008; 30:489-499.

63. Lenselink, C. H., Gerrits, M. M. J. G., Melchers, W. J. G., Massuger, L. F. A. G., van Hamont, D., Bekkers, R. L. M. Parental acceptance of human papillomavirus vaccines. *European Journal of Obstetrics and Gynecology* 2008; 137:103-7.
64. Lenselink, C.H. Schmeink, C.E., & W.J. Melchersv . Young adults and acceptance of the human papillomavirus vaccine, *Public Health* 2008; 122: 1295–1301.
65. Lloyd GP, Marlow LAV, Waller J, Miles A, Wardle J. An experimental investigation of the emotional and motivational impact of HPV information in adolescents. *J Adolesc Health* 2009; 45:532–4.
66. Locke, C., Ngan Hoa, N. T., & Thanh Tam, N. T. Visiting marriages and remote parenting: Changing strategies of rural-urban migrants to Hanoi, Vietnam. *Journal of Development Studies* 2012; 48:10–25.
67. Markowitz, L.E., Dunne, E.F., Saraiya, M., et al. Quadrivalent human papillomavirus vaccine: Recommendations of the Advisory Committee on Immunization Practices (ACIP) 2007; 56: 1-2.
68. Marlow, L., Zimet, G. D., McCaffery, K. J., Ostini, R., & Waller, J. Knowledge of human papillomavirus (HPV) and HPV vaccination: an international comparison. *Vaccine* 2013;31: 763–9.
69. Meschke, L.L., Bartholomae, S., Zentall, S.R. Adolescent sexuality and parentadolescent processes: promoting healthy teen choices. *Journal of Adolescent Health* 2002; 31:264–79.
70. Mira L. Katz, Jennifer A. Kam, Janice L. Krieger. Predicting HPV Vaccine Intentions of College-Age Males: An Examination of Parents and Son's Perceptions .*J Am Coll Health* 2012; 60(6): 449–459.
71. Moutsiakis, D.L. and Chin, N.P. Why Blacks do not take part in HIV vaccine trials. *Journal of the National Medical Association* 2007; 99:254-7.
72. Muhwezi WW, Banura C, Turiho AK, Mirembe F. Parents' knowledge, risk perception and willingness to allow young males to receive human papillomavirus (HPV) vaccines in Uganda. *PloS one* 2014; 9:106-686.

73. Mullen, P. D. (2010a). A systematic review of measures used in studies of human papillomavirus (HPV) vaccine acceptability. *Vaccine* 2010; 28: 4027–4037
74. Muhwezi, Wilson Winstons. Parents' Knowledge, Risk Perception and Willingness to Allow Young Males to Receive Human Papillomavirus (HPV) Vaccines in Uganda. *PLOS ONE*, 2014 ;9 : e106686.
75. Munoz, Castellsague, X., Berrington de Gonzalez, A., Gissman, L. Chapter 1: HPV in the etiology of human cancer. *Vaccine* 2006; 1-S10.
76. National Cancer Institute (NCI) (2012) Head and neck cancer.
77. National Institute of Hygiene and Epidemiology. Evaluating HPV vaccine delivery strategies in Vietnam 2012.
78. Newman, P. A., Logie, C. H., Doukas, N., & Asakura, K. HPV vaccine acceptability among men: a systematic review and meta-analysis. *Sexually Transmitted Infections* 2013; 89:568-74.
79. Nghi NQ, LaMontagne DS, Bingham A, et al (2010). Human papillomavirus vaccine introduction in Vietnam: formative research findings. *Sex Health*.2010; 7, 262-70.
80. Ngamjarus, Chongsuvivatwong, McNeil. Enhancement of Learning on Sample Size Calculation with a Smartphone Application: A Cluster-Randomized Controlled Trial. *Southeast Asian J Trop Med Public Health* 2017; 48: 240-52.
81. Ogilvie G, Anderson M, Marra F, McNeil S, Pielak K, Dawar M, et al. A population-based evaluation of a publicly funded, school-based HPV vaccine program in British Columbia, Canada: parental factors associated with HPV vaccine receipt. *PLoS Med* 2010; ;7: 10-270
82. Palefsky JM, Gillison ML, Strickler HD. Chapter 16: HPV vaccines in immunocompromised women and men. *Vaccine* 2007; 3: 140–6.
83. Partridge, J.M., Koutsky, L.A. Genital human papillomavirus infection in men. *The Lancet Infectious Diseases* 2006; 6:21-31.

84. Patel, D.A., Zochowski, M., Peterman, S., Dempsey, A., Ernst, S., & Dalton, V.K. (2012). Human papillomavirus vaccine intent and uptake among female college students. *Journal of American College Health* 2012; 60: 151-161.
85. Pelullo, C. P., Di Giuseppe, G., & Angelillo, I. F. Human papillomavirus infection: knowledge, attitudes, and behaviors among lesbian, gay men, and bisexual in Italy. *PloS One* 2012; 7:42-56.
86. Pelullo, C. P., Di Giuseppe, G., & Angelillo, I. F. Human papillomavirus infection: knowledge, attitudes, and behaviors among lesbian, gay men, and bisexual in Italy. *PloS One* 2012; 7(8):42-56.
87. Perkins RB, Tipton H, Shu E. Attitudes toward HPV vaccination among low-income and minority parents of sons: a qualitative analysis. *Clin Pediatr (Phila)* 2013;52:231–40.
88. Peters, RM., Aroian, KJ, and Flack, JM. African American culture and hypertension prevention. *Western Journal of Nursing Research* 2006; 28:831-54.
89. Proma Paul, Dscott LaMontagne. Knowledge of Cervical Cancer and HPV Vaccine Post-Vaccination among Mothers and Daughters in Vietnam *Asian Pacific journal of cancer prevention* 2012; 13:2587-92.
90. Public Health Agency of Canada. An Advisory Committee Statement (ACS) National Advisory Committee on Immunization (NACI). Update on the recommended Human Papillomavirus vaccine immunization schedule 2015; 97:25-56.
91. Ragin CC, Edwards RP, Jones J, Thurman NE, Hagan LK, Jones EA et al. Knowledge about human papillomavirus and the HPV vaccine – a survey of the general population. *Infect Agent Cancer* 2009; 4:S10.
92. Radisic G, Chapman J, Flight I, Wilson C. Factors associated with parents' attitudes to the HPV vaccination of their adolescent sons: a systematic review. *Preventive medicine*. 2017. February 1;95:26–37.

93. Reiter, PL., Brewer, NT., Gottlieb, S, McRee, AL, and Smith, JS. Parents' health beliefs and HPV vaccination of their adolescent daughters. *Social Science & Medicine* 2009; 69: 475-480.
94. Reynolds, J. P. HPV: a look into new methods for high-risk testing. *MLO Med Lab Obs* 2011; 43: 0580-7247.
95. Roland KB, Benard VB, Saraiya M, Hawkins NA, Brandt H, Friedman AL(2009) Assessing cervical cancer screening guidelines in patient education materials. *J Women's Health* 2009;18: 5–12.
96. Roland, K.; Bernard, V.; Saraiya M.; Hawkins, N.; Brandt, H. & Friedman, A. 2009. Assessing cervical cancer screening guideline in patient education materials. *Journal of women's Health* 2009;6:5-12.
97. Romanowski B, de Borja PC, Naud PS, et al. Sustained efficacy and immunogenicity of the human papillomavirus (HPV)-16/18 AS04-adjuvanted vaccine: analysis of a randomised placebo-controlled trial up to 6.4 years. *Lancet* 2009; 374:75-85.
98. Rosenstock ,I.M ,Strecher ,V.J.,&Becker ,M.H. Social learning theory and the Health Belief Model .*Health Education Quarterly* 1988; 15:175-83.
99. Rosenthal SL, Weiss TW, Zimet GD, Ma L, Good MB, Vichnin MD. Predictors of HPV vaccine uptake among women aged 19–26: Importance of a physician's recommendation. *Vaccine* 2011; 29:890-5.
100. S. S. Chan, T. H. Cheung, W. K. Lo, and T. K. H. Chung, “Women’s attitudes on human papillomavirus vaccination to their daughters,” *Journal of Adolescent Health* 2007 ; 41:204–207.
101. Saraiya M, Unger ER, Thompson TD, Lynch CF, Hernandez BY, Lyu CW, Steinau M, HPV Typing of Cancers Workgroup. US assessment of HPV types in cancers: implication for current and 9-valent HPV vaccines. *Journal of the National Cancer Institute* 2015; 107:107-086.

102. Sauvageau, C., Duval, B., Gilca, V., Lavoie, F., Ouakki, M. (2007). Human papilloma 79 virus vaccine and cervical cancer screening acceptability among adults in Quebec, Canada. *BMC Public Health* 2007; 6:304-310.
103. Schiller, J. T., Castellsagué, X., & Garland, S. M.. A review of clinical trials of human papillomavirus prophylactic vaccines. *Vaccine* 2012; 30: 123-138.
104. Schuster MA, Corona R, Elliott MN, et al. Evaluation of Talking Parents, Healthy Teens, a new worksite based parenting programme to promote parent-adolescent communication about sexual health: a randomised controlled trial. *BMJ* 2008;337:a308.
105. Shiels MS, Kreimer AR, Coghill AE, Darragh TM, Devesa SS. Anal cancer incidence in US 1977-2011 .*Cancer Epidemiology, Biomarkers and Prevention* 2015; 24:1548–1556.
106. Smeets, SJ, Hesselink, AT, Speel, E-JM et al. A novel algorithm for reliable detection of human papillomavirus in paraffin embedded head and neck cancer specimen. *Int J Cancer* 2007; 121: 2465–2472.
107. Smith, E., Hoffman, H., Summersgill, K., Kirchner, L., Turek, L., Haugen, T. Human Papillomavirus and Risk of Oral Cancer. *The laryngoscope* 1998; 108:1098-103.
108. Spano, J., Marcelin, A., Carcelin, G. HPV and cancer. *Bulletin du Cancer* 2005; 92:59-64.
109. Spleen A. An increase in HPV-related knowledge and vaccination intent among parental and non-parental caregivers of adolescent girls, age 9–17 years, in Appalachian Pennsylvania. *J. Cancer Educ* 2012; 27:312–319.
110. Spleen AM, Kluhsman BC, Clark AD, Dignan MB, Lengerich EJ. An increase in HPV-related knowledge and vaccination intent among parental and non-parental caregivers of adolescent girls, age 9–17 years, in Appalachian Pennsylvania. *J Cancer Educ* 2012; 27:312–9.

111. Sridawruand, C., Crozier, K., and Pfeil Pfeil. Attitudes of adolescents and parents towards premarital sex in rural Thailand: A qualitative exploration. *Sexual and Reproductive Healthcare* 2010; 1:181-187
112. Sridawruang, C., Pfeil, M., & Crozier, K. Why Thai parents do not discuss sex with their children: A qualitative study. *Nursing & Health Sciences* 2012; 12: 437-443.
113. Susan Kellogg Spadt, Talli Y.Rosenbaum. CME Information: Sexual Health and Religion: A Primer for the Sexual Health Clinician (CME). *The Journal of Sexual Medicine* 2014; 11: 1606–1619.
114. Szarewski, A. (2008). HPV vaccines: peering through the fog. *Journal of family Planning and reproductive health care* 2008; 34: 207–209.
115. Thianthai, C. Gender and Class Differences in Young People's Sexuality and HIV/AIDS risk-taking Behaviors in Thailand. *Culture, Health & Sexuality: An International Journal for Research, Intervention and Care* 2004;6: 189-203.
116. Trim, K., Nagji, N., Elit, L., & Roy, K. Parental Knowledge, Attitudes, and Behaviours towards Human Papillomavirus Vaccination for Their Children: A Systematic Review from 2001 to 2011. *Obstetrics and Gynecology International* 2012; 5:1-12.
117. Viens LJ, Henley SJ, Watson M, Markowitz LE, Thomas CC, Thompson TD, Razzaghi H, Saraiya M, Centers for Disease Control and Prevention (CDC). HPV-associated cancers-US, 2008-2012 .*Cancer* 2008; 113:2837-3057.
118. Villa, L. L., Costa, R. L., Petta, C. A., Andrade, R. P., Ault, K. A., Giuliano, A. R., Lehtinen, M. Prophylactic quadrivalent human papillomavirus (types 6, 11, 16, and 18) L1 virus-like particle vaccine in young women: a randomised double-blind placebocontrolled multicentre phase II efficacy trial. *The Lancet Oncology* 6, 271-278.
119. Von Ah D, Ebert S, Ngamvitroj A, Park N, Kang DH. Predictors of health behaviors in college students. *J Adv Nurs* 2004; 48:463–474.

120. Vu TH L, Bui D. Prevalence of cervical HPV infection among married women in Vietnam 2011. *Asian Pac J Cancer Prev* 2012; 13:37–40.
121. Vu VD, Le GM, Nguyen SM, Clatts MC, Goldsamt LA. High prevalence of gonorrhea and HPV among male sex workers in three cities of Vietnam: challenges in addressing HPV epidemic among MSM populations. *Sex Transm Infect* 2013; 89:A182.
122. Waller, J., McCaffery, K., & Wardle, J. Beliefs about the risk factors for cervical cancer in a British population sample. *Preventive Medicine* 2004; 38: 745–753.
123. WHO/ICO Information Centre on HPV and Cervical Cancer- HPV and cervical cancer statistics in India. 2010.
124. WHO: Human Papilloma Virus (HPV) and Cervical Cancer: Fact Sheet. World Health Organization; 2016.
125. WHO: Human papillomavirus vaccines: WHO position paper, May 2017 Recommendations. *Vaccine* 2017; 35:5753-5755.
126. World Health Organization. Delivery cost of human papillomavirus vaccination of young adolescent girls in Peru, Uganda and Viet Nam 2017 ;12:113-837
127. WHO: Number of new cases in 2018, all ages, Fact sheet . World Health Organization; 2018
128. Zimet GD. Health care professionals and adolescent vaccination. A call for intervention research. *Hum Vaccin Immunother* 2015; 10: 2629–2630.
129. Zimet, G. Potential barriers to HPV immunization: from public health to personal choice. *American Journal of Law and Medicine* 2009; 35: 389-399.

1

APPENDIX

APPENDIX B Advertisement

HPV Vaccine is cancer prevention

Health Talk Education program on HPV in boys at Nguyen Chi Dieu school on 8 am Saturday and Sunday

Human Papillomavirus(HPV) Vaccine for Boys

If there were a vaccine against cancer, wouldn't you get it for your kids?

**Contact us :Hue City ,Vietnam
Phone :0905876111
Email : Philipsnmd1@gmail.com**

The advertisement features a collage of images. The top half shows three smiling school boys in white uniforms with red neckties. The bottom left shows a close-up of a boy's arm being vaccinated by a healthcare worker in a white coat and blue gloves. The bottom right shows a group of people's hands joined together in a circle, symbolizing community and support.

APPENDIX C Study budget

Items	Unit	Cost/unit (USD)	Total(USD)	%
1. Personnel				
- Principal Investigator (full time 12 months)	1	900	900	15
- Research Assistant & data analyst (consultant)	1	500	500	9
- Graphic designer (contract for 75 hours)	1	1000	1000	16
2. Operating Costs				
-Teaching materials				
-Tools				
- Study advertising				
• Membership costs to access expatriate community networks	1	50	50	0.8
• Printing posters.	1	150	150	2
• Promoting the study on expatriate network in newsletters and magazines (space rental)	1	200	200	3.3
• Promoting the study through poster distribution (poster printing and posting fees)	1	100	100	1.6
– Intervention				
• Printing posters and business cards	1	50	50	0.8
- Final report				
• Data analysis (purchase of SPSS v. 21)	1	200	200	3.3
3. Dissemination of the results				
• Sharing of results at national conferences (including poster production fees, abstract submission and conference registrations and travel)	1	600	600	9.9
• Sharing of results at national conferences (including poster production fees, abstract submission and conference registrations and travel)	1	1500	1500	25
• Sharing of results at national conferences (including poster production fees, abstract submission and conference registrations and travel)	1	50	50	0.8
• Printing of final report for dissemination	3	250	750	1.2

• Publication in international journals				
			6050	100

APPENDIX D Questionnaires**I.Socio-demographic information****1. How many children do you have?**

- 1
 2
 More than 2

2. Age

Mother's age

- 31-35 yrs. 36-40 yrs. 41-45 yrs. 46-50 yrs. 51-55 yrs.
56-65 yrs.

3. How old years old our boy are ?

- 11 12 13 14 15

4. What is your religious affiliation?

- Christian
 Buddhist
Muslim
 Hindu
Other: _____

5. Marital status

- Single
Married
Divorced
Other
 Do not wish to specify.

6. Residence

- City
Rural

7. Family income per month

- Less than 5 millions vnd
- 5 millions to 10 millions vnd
- More than 10 millions vnd

8. What is your highest level of education?

- Less than high school
- High school
- College degree
- University – Bachelor-level Degree (BA, BSc, etc.)
- University – Master-level degree (MS, MA, etc.)
- University – Doctorate-level degree (Ph.D.)

II. HPV knowledge**1. HPV is a sexually transmitted infection 1**

- True
- False
- I don't know

2. Men cannot get HPV

- True
- False
- I don't know

3. There are many different types of HPV

- True
- False
- I don't know

4. HPV can be transmitted through oral sex

- True
- False
- I don't know

5. HPV infection can cause oropharyngeal (mouth and throat) cancer

- True
- False
- I don't know

6. HPV infection can cause genital warts in boys

- True
- False
- I don't know

7. HPV infection can cause penis cancer in boys

- True
- False
- I don't know

8. The HPV vaccine protects you from some types of HPV

- True
- False
- I don't know

9. The HPV vaccines are most effective if given to people who've never had sex

- True
- False
- I don't know

III. Perceive threat of HPV infection**1. Both men and women can get oropharyngeal cancer from HPV infection**

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

2. Having an HPV infection increases the risk of getting oropharyngeal cancer

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

3.Had many sexual partners and possibly at high risk for HPV infection.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

IV. Perceive severity of HPV infection

1. I feel that HPV is a serious infection for my son to contract.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

2. I feel that oropharyngeal cancer/ penile and anal cancer is a serious disease for my son to develop.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

3. I feel that genital warts are a serious disease for my son to develop.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

V. Perceive benefit and barrier of HPV vaccination

1. I believe HPV vaccinations are beneficial to the male population

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

2.A benefit to becoming vaccinated is that it will protect my son against HPV

3.. I think HPV vaccine protects my son against certain oropharyngeal cancer from HPV infection

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

4. I believe HPV vaccine protects against genital warts

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

5. Boys can obtain the HPV vaccine

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

6. I believe HPV Vaccinations are only beneficial for females

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

7.I do not feel there are any benefits to becoming vaccinated

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

8.HPV can may had side effects

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

9.HPV vaccine is safe

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

10. I am concerned about giving my child too many vaccines.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

11. The HPV vaccine is still so new that I want to wait awhile before deciding if my child should get it

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

12. I do not have enough information about the HPV vaccine to decide whether to give it to my child.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

13. If my child gets the HPV vaccine, he may be more likely to have sex.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

14. It is unlikely that my child will get HPV in the future.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

15. It is unlikely that my child will get an anogenital cancer (ie. penile, anal cancer) in the future.

1	2	3	4	5
Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree

VI. HPV Vaccination intention

1. Do you intend to take your son to get HPV vaccine?

Yes

No

Not sure

APPENDIX E

Intervention content



What HPV is

Human papillomavirus (HPV) is a common virus that is passed on through skin-to-skin contact. 4 out of 5 (80%) of us will have HPV at some point in our lives, but our immune system usually gets rid of it. We may not even know we had it!

Types of HPV

There are over 200 different types of HPV.

Genital HPV about 40 HPV types affect the genital areas of men and women. 60 HPV strains cause warts on the hands and / or feet

40 HPV strains are sexually transmitted via mucous membranes in and around genital areas Most of these strains do not cause serious health complications • High Risk Strains: HPV 6, 11, 16, and 18 o All of these strains are covered by the quadrivalent and 9-valent vaccine

HPV 16 and 18 are high-risk types known to significantly increase the risk of cervical, vaginal and vulvar cancer in women, as well as penile, head and neck cancer in men. The strains can also cause anal cancer and throat cancers in men and women.

HPV types 6 and 11 can cause genital warts



How do people get genital HPV?

Genital HPV is passed on through skin-to-skin contact including:

- Vaginal, anal and oral sex
- touching in the genital area
- sharing sex toys. HPV can be inactive (dormant) for many years, so it is hard to know when you got HPV or who you got it from. If you have a partner, getting HPV does not mean they have been unfaithful.

• **Why can't we all get rid of HPV?**

We don't know why some people get rid of HPV, while others may develop cell changes or possibly cervical cancer. This is why going for cervical screening when invited is important in helping prevent cervical cancer, as well as having the HPV vaccine if you are eligible.



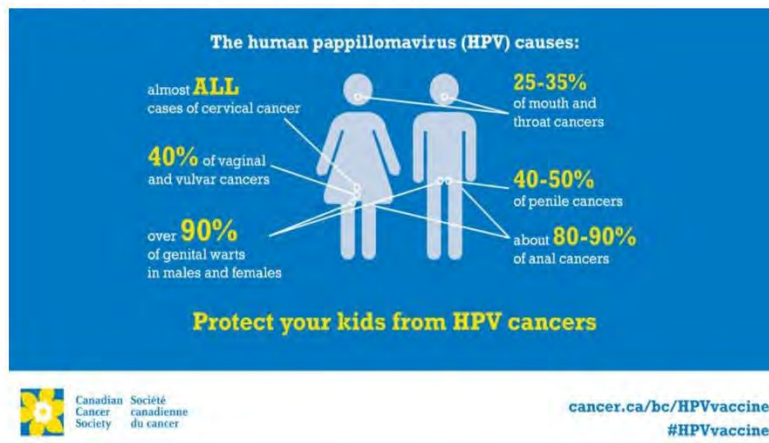
Is HPV cause cancer in Male?

Complications can HPV cause

- >60% Penile (men)
- >90% Anal (men & women)
- ~70% Oropharyngeal (men & women)
- For example, the CDC (2012) reported: Penis cancer, oropharynx, and anus are uncommon, only a subset of these cancers are related to HPV infection, every year in the U.S. there are about:
 - 400 men who had penis cancer related to HPV
 - 1,500 men who had anus cancer related to HPV
 - 5,600 men who had oropharynx cancer related to HPV
- The National Cancer Institute (NCI) (2012) recently revealed that roughly 85% of all cases who had anal cancer are caused by infection HPV type 16 and type 18.



What serious complications can HPV cause?



Questions:

How can women and men protect themselves from HPV infection

- Receive the HPV vaccine!
- The HPV vaccine The HPV vaccine protects against at least 2 high-risk HPV types (16 and 18) that cause 70% of all cervical cancers. Some HPV vaccines also protect against 2 low-risk HPV types (6 and 11) that cause 90% of genital warts.



There are 3 vaccines currently available

Name of vaccine	HPV types it protects against	Available on the NHS?	Available privately?
Gardasil	16, 18, 6 and 11	Yes, for girls under 18 years old	Yes, for girls and boys
Gardasil 9	16, 18, 31, 33, 45, 52, 58, 6 and 11	No	Yes, for girls and boys
Cervarix	16 and 18	No	Yes, for girls and boys

The NHS uses Gardasil as part of the national HPV immunisation programme, so in this booklet the HPV vaccine we talk about is Gardasil.



Who can have the HPV vaccine?

- As part of the national HPV immunisation programme, the vaccine is offered in schools to:

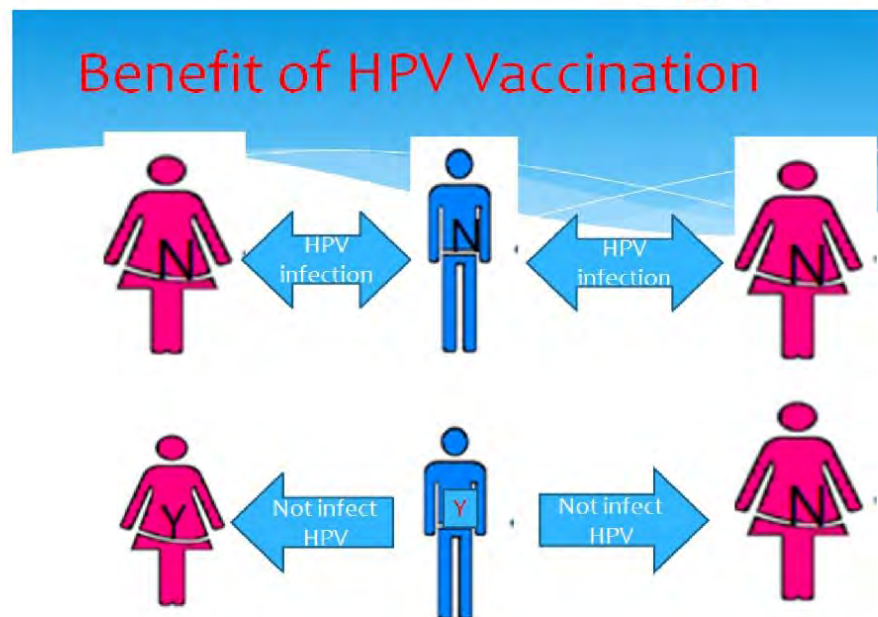
- Girls between the ages of 11 to 26 in Vietnam.

Can boys or men have the HPV vaccine?

- People who are born male do not have a cervix, so cannot develop cervical cancer.

- However, HPV can cause other cancers, including anal cancer, penile cancer and some head and neck cancers.

- At the moment, boys are not offered the HPV vaccine as part of the national programme. However, vaccinating girls helps protect boys against some types of HPV (herd immunity). HPV Genotyping





Is HPV vaccine safety and efficacy?

- The World Health Organization (WHO) has again reported in July 2017 that HPV vaccines are considered to be extremely safe.

- According to the World Health Organization (WHO) Global Advisory Committee for Vaccine Safety (GACVS) reviewed the evidence on the safety of Gardasil vaccine in 2007, 2008, 2009, 2013, 2014 and 2015.

- As with all approved vaccines, CDC and the Food and Drug Administration (FDA) closely monitor the safety of HPV vaccine to identify adverse events and side effects. Pre-licensure clinical trials and data collected after the vaccine was made available show that it is safe.

Side effects of the HPV vaccine

- The HPV vaccine is very safe. It has gone through a lot of trials with women of different ages to make sure it does not cause any harm and works properly. If any side effects are reported, they are usually common ones that may happen shortly after any injection.

- Very common side effects More than 1 in 10 people who have the HPV vaccine have:

- redness, swelling or pain at the injection site – this should get better after a few days

- A headache, but it should not last long.

- Common side effects More than 1 in 100, but less than 1 in 10, people who have the HPV vaccine have:



- bruising or itching at the injection site
- a high temperature or feeling hot and shivery (fever)
- sickness (nausea)
- Painful arms, hands, fingers, legs feet or toes. Rare side effects About 1 in 10,000 people who have the HPV vaccine have
- An itchy red rash (hives).

More information and support we hope this booklet has been helpful.

HPV infection symptoms



HPV on skin



HPV on mouth



HPV on mouth



HPV on tongue and teeth



If you have questions or need more information, visit our Health center or call our Helpline on 0084905876611.



HPV cancer can be prevented.

We're doing something about it by providing information and support to everyone who needs it.

The information content come from WHO, CDC.

APPENDIX F

Research Participant Information Sheet and Consent Form

Title of research project Effectiveness of Health Talk Education program on HPV (Human Papillomavirus) knowledge, perception and children vaccination intention among mothers of secondary school boys in Hue province Vietnam : A quasi-experimental study

Principal researcher's name Nguyen Minh Duc

Position Ph.d Student

Office address Hue Central Hospital ,Vietnam

Home address 60 Ngo Quyen street ,Hue City ,Vietnam

Telephone (office) 0084234847240

Telephone (home) 0084234850683

Cellphone 0084905876611

E-mail: Philipsnmdl@gmail.com

You are being invited to take part in a research project. Before you decide to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and do not hesitate to ask if anything is unclear or if you would like more information.

1. Objective (s) of the research is to assess an effectiveness of "Health talk" program on knowledge, perception and intention of Hpv vaccination among mothers of secondary school boys students.

2.Details of participant.

• There are 144 mothers of boys students from Nguyen Chi Dieu secondary school needed for intervention group .

The inclusion criteria

(1) Mothers of secondary school boys students in Hue city, students age from 11 to 15

(2) Mothers of these students provide written consent and be willing to participate in the study

(3) Not have severe allergies or serious diseases that require immediate medical attention (Parents and children)

Exclusion criteria

(1) Male secondary school students had HPV vaccinated

(2) Knowingly can not participate throughout the whole study

(3) Mothers of secondary school students who had HPV vaccination

3. Procedure upon participants

- Researcher use purposive sampling to choose 2 secondary schools .

- Researcher contact to principle of secondary school and teachers to contact mothers of boys students

- Mothers of boys secondary schools student of Nguyen Chi Dieu will be intervention group

4. Procedures and protocols

The intervention will be take place in class and health care provider will be give presentation about knowledge of HPV to mothers of secondary school boys students. Every time for presentation about HPV knowledge ,perception and intention will take 30 mins .

Intervention content

The first day: The researcher will give presentation in class.They will introduce about education program. Health care provider talk about what is HPV, type of HPV, how HPV transmitted to other people, HPV cause cancer in men and mention about story some case that had HPV infection .After presentation, every group will have discussion about knowledge that they learn and answer questions from researcher.

The second day: The researcher will give presentation about how to prevent HPV infection ,they will introduce 3 kinds of vaccine (Gardasil ,Gardasil 9 and Cervavix) to protect HPV type 6 ,11, especially type 16 and 18 .They mention more detail content of every kind of vaccine .They will show video about HPV vaccination program from WHO .Then health care provider will talk about benefit and side effect of HPV vaccination .After presentation ,every group will discuss together and answer questions from researcher .

The third day: Every group HPV will discuss all information that they learn from HPV education intervention with researcher and sharing ideas , experience of every people that they know about HPV education information.

The fourth day: Intervention groups will answer all questions from HPV education related HPV knowledge; perceive threat, severity, barrier, benefit and HPV intention after education intervention .

Data measurement tools include screening questionnaire, base line survey, and follow up surveys. The first follow-up will be conducted immediately after the intervention complete and the second follow-up will be conducted three months after the intervention complete.

There are 3 times to measure HPV knowledge ,perception and intention. The first time measure HPV knowledge ,perception and intention at baseline. The second time measure HPV knowledge ,perception and intention after education intervention .The third time measure HPV knowledge ,perception and intention after second follow up. The baseline survey take about 30 minutes to access and complete .And the follow up survey take approximately 50 mins to complete questions .

The follow up surveys will administer after the intervention finish and 3 months later .The purpose of the follow up survey is to measure students HPV knowledge and HPV vaccination intention after intervention.

5. Information related directly to you will be kept confidential. Results of the study will be reported as total picture. Any information which could be able to identify you will not appear in the report

6. State what researcher will do with personal data after research project is completed e.g. tape recorder will be deleted, questions will be destroyed.

7. There are a little risk/harm in this research .If participants don't feel comfortable to answer any questions they can skip that question and answer other questions .Research will take note some questions that they skip .

. Benefits

8. There will be have many benefits from this study. After intervention, researcher would like Ministry of Health officers awareness the important of HPV vaccination in communities especially pay attention for male HPV vaccination intention and uptake .Then they will have some new policy about HPV vaccination prevention strategies. Participants attend this research will have more knowledge about HPV ,they will talk to their children and bring them to clinic for vaccination .

9. There are no any souvenir or compensation for time loss/inconveniences, transportation fee etc .

10. Participation to the study is voluntary and participant has the right to deny and/or withdraw from the study at any time, no need to give any reason, and there will be no bad impact upon that participant.”

11. If you have any question or would like to obtain more information, the researcher can be reached at all time. If the researcher has new information regarding benefit on risk/harm, participants will be informed as soon as possible.” This practice will provide an opportunity for participants to decide whether to stay/not stay with the project.

12. If researcher does not perform upon participants as indicated in the participant information sheet and consent form, the participants can report the incident to the Research Ethics Review Committee for Research Involving Human Research Participants, Health Sciences Group, Chulalongkorn University (RECCU) Jamjuree 1 Bldg., 254 Phyathai Rd., Patumwan district, Bangkok 10330, Thailand, Tel./Fax. 0-2218-3202, 0-2218-3409 E-mail: eccu@chula.ac.th

I have read details in participant information sheet and consent form and I have been informed and explained about rationale/objective(s), research procedures, and risk and benefit of research project by researcher. I clearly understand with satisfaction and willing agree participate in this research project and give consent the researcher by signature and also received a copy of participant information sheet and consent form.

Sign.....	Sign.....
).....().....(
Principal investigator	Research participant
Date...../...../.....	Date...../...../.....
Sign.....	Sign.....
).....().....(
Witness	Mothers or guardian of participant
Date...../...../.....	Date...../...../.....

VITA

NAME: Nguyen Minh Duc
DATE OF BIRTH: 04/07/1984
PLACE OF BIRTH: Hue City, Vietnam
INSTITUTIONS ATTENDED: Chulalongkorn University
HOME ADDRESS: Vy Da street, Hue City, Vietnam