An exploration of the challenges to and enablers of parental HPV vaccination decision for adolescent daughters among South Asian ethnic minorities in Hong Kong

Research Report

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EXECUTIVE SUMMARY

BACKGROUND

Human papillomavirus (HPV) infections account for most cases of cervical cancer. HPV vaccines are safe and effective in preventing HPV infections and also in preventing cervical cancer. The WHO recommends girls aged 9 to 14 receive HPV vaccinations. In Hong Kong, HPV vaccinations are approved for administration in girls from the age of 9 onwards. Although HPV vaccines have been registered since 2006 for preventing cervical cancer in Hong Kong, the uptake of HPV vaccinations among adolescent girls in Hong Kong remains low (12%), according to a report from the Family Planning Association of Hong Kong (2017). The uptake of HPV vaccinations among adolescent girls of ethnic minorities in Hong Kong is expected to be even lower than in the general population as they face multiple barriers to the access of health services. Ethnic minorities constitute 8% of Hong Kong's total population and South Asians constitute the largest ethnic minority population. Studies have shown that ethnic minorities face multiple barriers to the access of health services because they may possess insufficient knowledge and language skills, have limited ability to attend services, and maintain specific health beliefs.

To improve HPV vaccine uptake, the Government of Hong Kong added the HPV vaccine to the Hong Kong Childhood Immunisation Programme at the start of the 2019 school year. This allowed female students who were of suitable age-typically at the Primary 5 and 6 school levels-to receive the HPV vaccine on a voluntary basis and at no charge. However, there has not been any conclusive evidence to suggest that inclusion of the HPV vaccine in immunisation programmes have improved HPV vaccine uptake. Studies have suggested that the uptake rates of the HPV vaccine remain lower than that of other childhood vaccines included in the school-based immunisation programme. According to the latest press release made by the Government in January 2021, a total of 24,200 Primary 5 female students from 594 participating primary schools had received HPV vaccine (first dose), resulting in an uptake rate of 85%.

The uptake could be affected by several factors such as the disease burden on society, vaccine safety and efficacy, and vaccine acceptance by the public. Apart from these, to understand the factors influencing the uptake of HPV vaccines among adolescent girls, it is essential to investigate parents' intention to vaccinate their children. As presented in previous research, in Hong Kong, parents significantly influence the HPV vaccine uptake rates of their daughters. Despite the availability of this information, no studies have been conducted to investigate the factors (from the perspectives of South Asian parents) affecting HPV vaccine uptake by ethnic minorities in Hong Kong.

To improve the HPV vaccine uptake among ethnic minorities in Hong Kong, it is vital to understand the barriers that hinder South Asian parents (in this study, South Asians refer to Indians, Pakistanis and Nepalese) from allowing their adolescent daughters to be vaccinated. By comparing the factors that correlate with HPV vaccinations among South Asian and Chinese mothers in Hong Kong, the unique needs of South Asian ethnic minorities can be better understood. The findings of the study can also guide the development of appropriate interventions and healthcare policies for improving HPV vaccine uptake by South Asians in Hong Kong. Such efforts will ultimately help enable equal access to health services for Hong Kong's ethnic minorities and the general population.

The main purpose of this study was to explore the perceptions of South Asian mothers in Hong Kong towards their adolescent daughters' HPV vaccinations. The perception of Chinese mothers was also explored to reveal any differences between two groups of mothers. The specific research questions were as follows:

1. What do South Asian and Chinese mothers in Hong Kong perceive to be the challenges and

enablers of having their adolescent daughters vaccinated against HPV?

2. Do these perceived challenges and enablers differ between mothers from different ethnic backgrounds?

METHOD

A qualitative exploratory study design was used. Semi-structured focus group interviews were conducted and moderated by the investigator(s) and trained South Asian interpreters when required. In this study, both South Asian and Chinese mothers were our target participants. To be eligible, they should meet the following inclusion criteria: 1) be a mother of at least one 9–17-year-old adolescent girl; 2) be of South Asian (Indian, Pakistani or Nepalese) or Chinese ethnicity; 3) be able to complete the interview in English, Hindi, Urdu, Nepali or Cantonese; and 4) be of age 18 or older.

Purposive sampling was used. All the eligible participants were recruited from various community centres and non-government organisations (NGOs) that served South Asians or local Chinese mothers. After written consents were obtained from the participants, between May and September 2021, 20 semi-structured focus group interviews were conducted using appropriate language. Seventy-three South Asian mothers (22 Indian, 24 Pakistani and 27 Nepalese mothers) and 12 Chinese mothers participated in the focus group interviews. All the interviews were audio-recorded and transcribed verbatim. All the collected data were analysed using content analysis, in accordance with the study objectives.

SOCIO-DEMOGRAPHIC INFORMATION OF PARTICIPANTS

The monthly household income was generally lower among the South Asian mothers when compared to the Chinese mothers. The education level of the Chinese mothers was generally higher than the South Asian mothers, with more Chinese mothers received tertiary education. The HPV vaccination uptake was similar between South Asian and Chinese groups, despite a comparatively lower uptake observed among the Pakistani group.

KEY FINDINGS FROM THE FOCUS GROUP INTERVIEWS

Key findings on the perceived challenges faced by South Asian mothers in vaccinating their daughters

1. Lack of awareness and knowledge of cervical cancer, HPV or the HPV vaccine

A majority of participants had not heard of the terms 'human papillomavirus', 'cervical cancer' or 'HPV vaccine' (or 'cervical cancer vaccine'). The South Asian mothers were also found to have poor knowledge of cervical cancer and the HPV vaccine.

2. Low level of perceived susceptibility of their daughters to HPV and low level of perceived need for their daughters to receive HPV vaccinations

Indian and Pakistani mothers reported a low level of perceived susceptibility of their daughters to an HPV infection or cervical cancer. Only Pakistani mothers reported a significantly lower level of perceived need for vaccinating their adolescent daughters. In three South Asian groups, the mothers' perceived susceptibility of their daughters to cervical cancer and the perceived need for their daughters to be vaccinated were generally linked to their daughters' age and sexual activity.

3. Concerns about the safety and side effects of the HPV vaccine

The Indian mothers generally perceived the HPV vaccine to be safe and had fewer concerns regarding the side effects. Even though some Nepalese mothers perceived the side effects of the HPV vaccine to be mild, over one quarter of all Nepalese mothers refused to vaccinate their daughters. The Pakistani mothers had concerns about the side effects of the HPV vaccine and questioned the vaccine's safety. Several Pakistani mothers questioned the safety of the HPV vaccine as they were worried about 'hidden' side effects (i.e., side effects that had not been reported to the public or that had not yet been discovered).

4. Concerns about the cost of the HPV vaccine

The high cost of the vaccination and lack of available financial subsidies were the main barriers to their intention to vaccinate. More Nepalese and Pakistani mothers reported that they did not plan to vaccinate their daughters as they could not afford the financial expenses of HPV vaccination. Indian mothers viewed the high cost of HPV vaccination as a burden to their families. Although they regarded the cost of vaccination to be high, most Indian mothers were willing to vaccinate their daughters at their own expense if required.

5. Lack of recommendations for the HPV vaccine from the healthcare professionals

All the South Asian mothers regarded healthcare professionals to be the most trustworthy source of health information, including information about the HPV vaccination. However, none of them had received recommendations from healthcare professionals about HPV vaccinations when they accompanied their daughters to medical consultations.

6. Consideration of family support for their daughters to receive HPV vaccination

Family members had a significant influence on South Asian mothers' decisions to vaccinate their daughters against HPV. In Indian and Nepalese families, decisions about vaccinating daughters were the results of joint decision-making involving both mothers and fathers. Although joint decision-making by both parents was observed in Pakistani families, Pakistani mothers felt the obligation to seek consent from their husbands on the decision to vaccinate their daughters against HPV.

7. Religious and cultural factors

All the South Asian mothers reported that their religious beliefs did not restrict their vaccination practices. Nonetheless, the perceptions of HPV vaccination held by Muslim mothers were indirectly affected by their Islamic religion. Discussing cancer-related information, especially in public, is considered to be inappropriate among South Asians. Therefore, they did not actively seek cancer-related information from their doctors.

8. Language barriers to accessing health services

South Asian mothers faced some language barriers when they tried to access health services. The Indian mothers reported that not all the healthcare staff could speak English. They experienced problems in communicating with the Chinese speaking healthcare staff when arranging vaccination for their daughters. Most Pakistani mothers had a poor grasp of the English language, they needed their husbands to accompany them or needed to use an interpreter when visiting health services. Although an interpreter service was available at the clinics, most of the South Asian mothers expressed that they needed to request this service at least one week prior to their appointments. Furthermore, the availability of an interpreter service was not guaranteed, the mothers had to cancel their medical appointments if interpreter services could not be arranged.

Key findings on the perceived enablers of South Asian mothers for vaccinating their daughters

1. Trustworthy sources of HPV vaccine information

The South Asian mothers shared a common preference for receiving health information from health talks, community centres, healthcare professionals, their daughters' teachers or school and health centres. With respect to the type of speaker in conducting the health talk, they trusted the information if it was conducted by healthcare professionals.

2. High level of perceived benefit of HPV vaccination

Many South Asian mothers thought that HPV vaccine could protect their daughters from cervical cancer. The perceived protection offered by the HPV vaccine was the major factor that elicit the mothers' intention to vaccinate their daughter for those who considered the benefit of HPV vaccine outweighing the potential side effects.

3. High level of perceived severity of HPV infection and cervical cancer

Many South Asian mothers regarded cancer as being a scary, life-threatening and dangerous experience for their daughters. Infertility was a frequently reported physical concern. Indian and Pakistani mothers expressed worries of an HPV infection eliciting problems with trust in their daughters' future marital relationships. Nepalese mothers specifically expressed their worries that their daughters would be stigmatised as cancer patients.

4. Provision of subsidised vaccination

Most of the South Asian mothers expressed that providing the vaccination free of charge would encourage them to vaccinate their daughters. Especially for mothers who experienced financial constraints, offering the vaccination free of charge could help to remove a major financial barrier to vaccinating their daughters.

5. School- or Government- arranged vaccination programme

The South Asian mothers placed their trust in vaccinations that were arranged either by the schools or the Government. Moreover, such arrangements helped address mothers' knowledge deficiencies on where and how to arrange vaccinations for their daughters. They also helped overcome the practical barriers when arranging for vaccinations, such as language barriers and time constraints.

Key findings on the perceived challenges faced by Chinese mothers in vaccinating their daughters

1. Lack of knowledge about cervical cancer or the HPV vaccine

All the Chinese mothers were aware of cervical cancer and the HPV vaccine. However, they did not have enough knowledge on the level of efficacy of vaccine, side effects and the age for HPV vaccination.

2. Concern about the cost of the HPV vaccine

Although most Chinese mothers claimed that the cost of HPV vaccine would not stop them from vaccinating their daughters provided the vaccine was effective, some mothers revealed that the cost could be a factor that delayed their vaccination decisions for their daughters.

Key findings on the perceived enablers of Chinese mothers for vaccinating their daughters

1. Recommendation from healthcare professionals

One-third of the Chinese mothers had received recommendations from their doctors to vaccinate their daughters. The recommendations from the doctors positively affected the mothers' intention to vaccinate their daughters.

2. Trustworthy sources of HPV vaccine information

Chinese mothers preferred to receive health information from the following sources: doctors, government websites and printed materials issued by schools or the Government. Chinese mothers were confident of the trustworthiness of the information and they considered these sources to be important enablers of parental decisions.

3. High level of perceived susceptibility to the disease and needs of vaccination

Many of the Chinese mothers perceived their daughters to be susceptible to HPV infections. These mothers also perceived a need to vaccinate their daughters during the daughters' adolescence. The perceived susceptibility to the disease and the need for vaccination were generally linked with the daughters' age and sexual activity status. The most frequently reported reasons were that mothers were more open to sexual relationships or complicated social lives of their daughters.

4. High level of perceived benefits of HPV vaccination

Most mothers thought that the vaccine can protect their daughters from HPV and cervical cancer.

5. Perception of the vaccine as being safe

In general, Chinese mothers regarded the HPV vaccine as being safe. Some of the mothers had concerns about the side effects of the vaccine, such as effects on puberty. However, concerns about the side effects did not hamper their vaccination intention.

6. School- or Government- arranged vaccination programme

The Chinese mothers reported that the inclusion of the HPV vaccine in the Hong Kong Childhood Immunisation Programme by the Government improved their confidence in the safety and efficacy of the HPV vaccine and increased their perceived need for vaccinating their daughters. The school-arranged vaccination programme also reduced the time constraints for Chinese mothers in arranging vaccinations for their daughters.

Key findings on the similarities and differences in the perceived challenges and enablers of South Asian and Chinese mothers for vaccinating their daughters

- 1. Five challenges and enablers were common across the ethnic groups: 1) lack of knowledge about cervical cancer, HPV or the HPV vaccine; 2) concerns about the cost of the HPV vaccine; 3) trustworthy sources of HPV vaccine information; 4) high level of perceived benefits of receiving the HPV vaccination; and 5) vaccination programmes arranged by the school or the Government.
- Some challenges and enablers that were only applicable to South Asians were 1) lack of awareness about cervical cancer, HPV or the HPV vaccine; 2) concerns about the safety and side-effects of the HPV vaccine; 3) lack of recommendations from healthcare professionals; 4) consideration of family support for their daughters to receive HPV vaccination; 5) religious and cultural factors; 6) language barriers experienced when

accessing health services; 7) high level of perceived severity of HPV infections and cervical cancer; and 8) provision of subsidised vaccinations.

RECOMMENDATIONS

Based on the study's findings, the following recommendations are made:

- 1. Health promotional campaign on cervical health and HPV vaccination should be conducted. These can be conducted through community-based educational interventions and in schools through lecture presentation and educational videos with content on the link between cervical cancer, HPV and HPV vaccination and detailed information on the HPV vaccine, such as eligibility and dosage.
- 2. Health promotional campaign should be delivered by healthcare professionals such as nurses or doctors to enhance mothers' confidence in the trustworthiness of the information delivered. In addition, schoolteachers should be made knowledgeable of cervical health and the HPV vaccine.
- 3. The school immunisation team of the Department of Health should organise school-based health talks half a year before implementation of the vaccination programme for each study year for the mothers of Primary 4 and 5 students. This can better prepare the mothers and allow time for them to ask and search for more information.
- 4. Health promotional materials such as videos, posters and leaflets should be prepared in relevant South Asian languages (e.g. Hindi, Urdu, and Nepali) to facilitate the South Asian mothers' understanding of HPV vaccine-related information.
- 5. To ensure equal access to health-related information, linguistically appropriate health promotional materials such as videos and leaflet should be disseminated via platforms commonly used by South Asian mothers (for example, YouTube, Facebook and WhatsApp).
- 6. To ensure equal opportunity in receiving recommendation for HPV vaccination, healthcare professionals should be encouraged to make use of health or disease consultations with South Asian mothers and offer advice on HPV vaccinations for mothers with daughters aged 9-17.
- 7. Unvaccinated adolescent girls studying in secondary schools are currently not eligible to receive the vaccine through the Hong Kong Childhood Immunisation programme. We recommend the implementation of a catch-up HPV vaccination programme for all adolescents till age 18 if they are not adequately vaccinated.
- 8. To overcome the concerns about the cost of the vaccine and the ineligibility of adolescent girls aged under 18, we recommend that the Government resume the Community Care Fund and provide subsidised HPV vaccinations to low-income families to alleviate financial difficulties, especially those from South Asian groups.
- 9. In view of religious and cultural factors that hamper South Asian mothers' intention to vaccinate their daughters, healthcare professionals should be more culturally sensitive

when offering advice. Training should be offered to enhance healthcare professionals' cultural sensitivity.

10. In view of the language barriers experienced by South Asian mothers, resources should be allocated to improve the provision of interpretation services. These include the training of additional medical interpreters and the provision of 24-hour onsite interpretation services.

CHAPTER 1

INTRODUCTION

1.1 Background

Human papillomavirus (HPV) infections account for most cases of cervical cancer. The World Health Organization (WHO) (2021) has reported that cervical cancer is the fourth most prevalent cancer among women globally, accounting for 604,127 new cancer cases and 341,831 deaths in 2020. Studies have shown that HPV vaccines are safe and effective in preventing HPV infections and in preventing cervical cancer. The WHO recommends girls aged 9 to 14 to receive HPV vaccinations, i.e., before they become sexually active (WHO, 2020). In Hong Kong, HPV vaccinations are approved for administration in girls from the age of 9 onwards. Although HPV vaccines have been registered since 2006 for preventing cervical cancer in Hong Kong, the uptake of HPV vaccinations among adolescent girls in Hong Kong remains low (12%), which is substantially lower than that among adolescent girls in Western countries (75.1% in the United States) (Family Planning Association of Hong Kong, 2017, Pingali et al., 2021).

The uptake of HPV vaccinations among adolescent girls of ethnic minorities in Hong Kong is expected to be even lower than in the general population. Ethnic minorities constitute 8% of Hong Kong's total population, though this proportion has increased rapidly over the past 10 years (Census and Statistics Department, 2017). South Asians constitute the largest ethnic minority population in Hong Kong (after excluding Filipinos and Indonesians who undertake temporary work in Hong Kong). In this study, South Asians refer to Indians, Pakistanis and Nepalese; these three ethnicities comprise the majority of the South Asian population in Hong Kong (Census and Statistics Department, 2017). Studies have shown that ethnic minorities in Hong Kong face multiple barriers to the access of health services. In particular, many South Asian women experience difficulties in accessing cervical cancer screening because they may

possess insufficient knowledge and language skills, have limited ability to attend services, and maintain specific health beliefs (So et al., 2017). Similarly, another study reported that ethnic minorities in the United Kingdom faced language and literacy barriers to the uptake of HPV vaccinations (Ferrer et al., 2015). Another study in the United States found that only 33% of Cambodian girls aged 13 to 17 initiated the HPV vaccination series, compared to 54% of girls in the same age range in the general population (Taylor et al., 2014). Similar patterns have been observed among ethnic minority groups in the Netherlands (Alberts et al., 2017) and among Latinos living along the United States–Mexico border in Texas (Morales-Campos & Parra-Medina, 2017).

To improve HPV vaccine uptake, the Government of Hong Kong added the HPV vaccine to the Hong Kong Childhood Immunisation Programme (HKCIP) at the start of the 2019 school year. This allowed female students who were of suitable age – typically at the Primary 5 and 6 school levels – to receive the HPV vaccine on a voluntary basis and at no charge (Department of Health, 2020). However, there has not been any conclusive evidence to suggest that inclusion of the HPV vaccine in city-wide immunisation programmes have improved the overall HPV vaccine uptake. Studies have suggested that the uptake rates of the HPV vaccine remain lower than that of other childhood vaccines included in the school-based immunisation programme (Feiring et al., 2015; Middleman et al., 2016; Pot et al., 2017).

According to the latest press release made by the Government in Jan 2021, a total of 24,200 Primary 5 female students from 594 participating primary schools had received HPV vaccine (first dose), resulting in an uptake rate of 85% (The Government of the Hong Kong Special Administrative Region, 2021). The uptake rate could be affected by several factors such as the disease burden on society, vaccine safety and efficacy, and vaccine acceptance by the public. Apart from these, to understand the factors influencing the uptake of HPV vaccines among adolescent girls, it is essential to investigate parents' intention to vaccinate their children. Previous studies have found that parents significantly influence the HPV vaccine uptake rates of their daughters and that, when making health decisions, teenagers often adopt their parents' perspectives (Siu, 2014). Alberts et al. (2013) found that mothers' intention to vaccinate was the strongest predictor of their daughters' HPV vaccine uptake. In a systematic review, Newman et al. (2018) found that multiple factors correlated with the parents' decisions regarding HPV vaccinations. Specifically, the factors that were linked to parental favour for their daughters' HPV vaccinations were the recommendations of healthcare providers; mothers being decision-makers for HPV vaccinations; parents' intention to vaccinate; parental beliefs in the efficacy of HPV vaccinations; the benefit of the HPV vaccine as perceived by the parents and their expected feelings of regret in preventing their daughters' use of preventive healthcare measures; and sociodemographic factors such as residential location and daughters' age. In contrast, the factors associated with parents' reluctance for their daughters' HPV vaccinations were the parents' actions about the safety of the HPV vaccine and the cost of vaccinations were the rate., 2018).

Several studies conducted in Hong Kong have explored the factors correlated with HPV decision-making in Chinese parents (Loke et al., 2017; Wang et al., 2015). Loke et al. (2017) showed that the major predictive factor for parental acceptance of the HPV vaccine among Chinese mothers in Hong Kong was their perception that the vaccine was safe. Similarly, Wang et al. (2015) found that the principal determinants of parental HPV vaccination intention among Chinese parents in Hong Kong were: anticipated worry if not vaccinated, anticipated anxiety reduction after HPV vaccination; proneness to peer influence; private health insurance for the children; perception of their daughters' susceptibility to cervical cancer; the total number of daughters; the descriptive norms of HPV vaccinations; and the parents' anticipated regret over their daughters not being vaccinated. Despite the availability of this information, no studies

have been conducted to investigate the factors affecting HPV vaccine uptake by ethnic minorities in Hong Kong. It is therefore crucial to investigate HPV vaccine uptake by South Asian adolescent girls in Hong Kong and specifically, the influence of vaccination decisions by the parents, especially the mothers, on the uptake of HPV vaccine by daughters.

To address the ethnic disparities and to improve the HPV vaccine uptake in Hong Kong, it is vital to understand the barriers that hinder South Asian parents from allowing their adolescent daughters to be vaccinated. By comparing the factors that correlate with HPV vaccinations among South Asian and Chinese mothers in Hong Kong, the unique needs of South Asian ethnic minorities can be better understood. Such an understanding can enhance the awareness of healthcare professionals and thus improve their capacities for assisting South Asian families in overcoming barriers to HPV vaccine uptake. The findings of the study can also potentially guide the development of appropriate interventions and healthcare policies for improving HPV vaccine uptake by South Asians in Hong Kong. Such efforts will ultimately help enable equal access to health services for Hong Kong's ethnic minorities and the general population.

1.2 Research Questions

The main purpose of this study was to explore the perceptions of South Asian mothers in Hong Kong towards their adolescent daughters' HPV vaccinations. The perception of Chinese mothers was also explored to reveal any differences between two groups of mothers. The specific research questions were as follows:

- 1. What do South Asian and Chinese mothers in Hong Kong perceive to be the challenges and enablers of having their adolescent daughters vaccinated against HPV?
- 2. Do these perceived challenges and enablers differ between mothers from different ethnic backgrounds?

CHAPTER 2

METHODOLOGY

2.1 Research design

A qualitative exploratory study design was used. Specifically, semi-structured focus group interviews were conducted and moderated by the investigator(s) and trained South Asian interpreters when required. A semi-structured interview guide (Appendix 5) was used to guide the interview.

2.2 Study framework

The development of the interview guide was informed by evidence from the literature, the Health Belief Model (HBM) and the Theory of Planned Behaviour (TPB). The HBM predicts modifiable behaviour using five constructs: the perceived susceptibility to the target health problem (i.e., the perceived risk of contracting the targeted health problem); the perceived severity of the targeted health problem; the perceived benefits of performing the targeted health behaviour; the perceived barriers to performing the targeted health behaviour; and the cues to action (i.e., the internal and external cues that motivate the targeted health behaviour) (Rosenstock, 1974). In contrast, the TPB emphasises that intentions predict behaviours. It predicts that any intention to perform a health behaviour is determined by attitudes, subjective norms (i.e., the perceived social pressure to engage or not engage in a targeted health behaviour) and perceived behavioural control (i.e., a person's judgement of whether he/she is able to perform the targeted health behaviour) (Azjen and Driver, 1991).

The interview guide was designed to capture each participant's perception of their daughters' susceptibility to contracting an HPV infection, their perceived severity of an HPV infection, their perceived benefit of having their daughter(s) receiving an HPV vaccination and the perceived barriers to and enablers of deciding in favour of their daughters' vaccination. The

guide was also designed to explore external factors that could influence the vaccination decisions of the mothers.

2.3 Study participants

Our target participants were South Asian and Chinese mothers in Hong Kong. All individuals had to meet the following inclusion criteria for eligibility: 1) be a mother of at least one 9–17-year-old adolescent girl; 2) be of South Asian (Indian, Pakistani or Nepalese) or Chinese ethnicity; 3) be able to complete the interview in English, Hindi, Urdu, Nepali or Cantonese; and 4) be of age 18 or older.

In addition to the above criteria, we invited participants from diverse backgrounds, such as social classes (indicated by the median monthly household income), education levels and durations of living in Hong Kong.

Seventy-three South Asian mothers (22 Indian, 24 Pakistani and 27 Nepalese mothers) and 12 Chinese mothers participated in these focus group interviews. The socio-demographic information of our participants was provided in Appendices 1 to 4. Among the South Asian participants, the education level of the Indian mothers was of the highest, with majority (72.7%) of them received tertiary education. More than half (55.6%) of the Nepalese mothers received secondary education while majority (58.3%) of the Pakistani mothers received primary or lower education. While 31.8% of Indian mothers and 37.0% of the Nepalese mothers were with monthly household income of HK\$20,001-\$30,000, 29.2% of Pakistani mothers were with monthly household income of HK\$10,001-\$20,000. A majority of the South Asian mothers has been living in Hong Kong for 10 to 20 years (50% of Indian mothers; 59.3% of Nepalese mothers).

The religion of the Indian mothers were mainly Hinduism (50%) and Islam (36.3%); the Nepalese mothers mainly believed in Hinduism (44.4%) and Buddhism (44.4%); all the Pakistani mothers were Muslim. Regarding the vaccination status, 16 out of 73 (21.9%) of their

17

daughters (5 Indians, 9 Nepalese and 2 Pakistanis) had received HPV vaccination provided at schools by the outreaching School Immunisation Teams of the Department of Health. Among the Chinese mothers, more than half of them had no religion (58.3%), received tertiary education (75.0%), and with monthly household income of HK\$60,000 or more (58.3%). Regarding the vaccination status, 3 out of 12 (25%) of their daughters had received HPV vaccination provided at schools by the outreaching School Immunisation Teams of the Department of Health.

2.4 Study setting and sampling method

Purposive sampling was used to select information-rich cases for an in-depth investigation and to ensure that adequate numbers of Indian, Pakistani, Nepalese and Chinese mothers were recruited. All the eligible participants were recruited from various community centres and nongovernment organisations (NGOs) that served South Asians or local Chinese mothers. Community partners from each ethnic group were approached to assist in contacting members of the respective groups, to facilitate the recruitment of participants and to verify the credibility of the researcher(s) and the current study.

2.5 Data collection procedures and data analysis

Community partners from the community centres and NGOs serving South Asians and Chinese were contacted by the investigator(s) to obtain access to potential participants. The purpose of the study, eligibility criteria of participants and methods of data collection were explained to the potential participants. After written consents were obtained from the participants, demographic data, such as each participant's primary language, religion, monthly household income, education level, and duration of living in Hong Kong, were collected. For each focus group, one language (i.e., either English, Cantonese, Hindi, Urdu or Nepali) was used to conduct the interview. The specific language was determined based on the ethnic backgrounds and preferences of the participants. Semi-structured focus group interviews were conducted by the investigator(s), who were bilingual in English and Chinese. For focus group interviews that were conducted in Hindi, Urdu or Nepali, trained bilingual (i.e., speaking English and either Hindi, Urdu or Nepali) South Asian assistants were present throughout the interviews to provide simultaneous interpretations. Chinese mothers were recruited to the focus groups by the investigator(s), who also moderated the sessions. All the interviews were conducted either in person in private rooms provided by the community centres or online via Zoom if the participants preferred this option owing to the COVID-19 pandemic. Monetary incentive of HK\$100 was provided to each participant for appreciation. A total of twenty-two focus groups were conducted (5 Indian groups, 8 Pakistani groups, 4 Nepalese groups, and 3 Chinese groups) from May to September of 2021.

The interviews lasted for 60–90 minutes. All the interviews were audio-recorded with the permission of the participants and transcribed. All the transcribed verbatims were examined by bilingual checkers to ensure that the responses transcribed in English accurately corresponded to the original languages used by the participants during the interviews. All the collected data were analysed using content analysis, in accordance with the study objectives. Each text was read line-by-line and responses to different themes of the interview were coded. These data-driven codes were subsequently consolidated under different themes organised by their contextual meanings.

2.6 Ethical considerations

Ethical approval was sought from the Survey and Behavioural Ethics Committee of the Chinese University of Hong Kong (Ref. No. SBRE-20-754). All the participants were assured that their participation was voluntary and that they could withdraw from the study at any time. The participants were provided with an information sheet detailing the purpose, nature, procedures, potential benefits, and potential harms of the study. Each participant's written consent was obtained upon agreement with the information on the sheet. All the participants were assured that the collected data would be used exclusively for research purposes and that their responses would be kept anonymous.

CHAPTER 3

FINDINGS FROM FOCUS GROUP INTERVIEWS

This chapter presents the findings of the focus group interviews. Specifically, the participants' perceived challenges and enablers to vaccinating their daughters against HPV are presented in accordance with the constructs of the aforementioned HBM and TPB. The findings from South Asian mothers are first presented, followed by those from Chinese mothers. A table summarising the similarities and differences in the perceived challenges faced by and enablers of South Asian and Chinese mothers is presented at the end of the chapter.

Part A Findings on South Asian mothers

3.1 Perceived challenges faced by South Asian mothers in vaccinating their daughters

Across the three ethnic minority groups (Indian, Pakistani, and Nepalese), only half of the mothers expressed positive vaccination intention for their daughters. The commonly reported perceived challenges to their daughters' HPV vaccinations were 1) lack of awareness and knowledge of cervical cancer, HPV or the HPV vaccine; 2) low level of perceived susceptibility of their daughters to HPV and low level of perceived need for their daughters to receive HPV vaccinations; 3) concerns regarding the safety and side effects of the HPV vaccine; 4) concerns about the cost of the HPV vaccine; 5) a lack of recommendation for the HPV vaccine from healthcare professionals; 6) consideration of family support for their daughters to receive HPV vaccination; 7) religious and cultural factors; and 8) language barriers to accessing health services.

3.1.1 Lack of awareness and knowledge of cervical cancer, HPV or the HPV vaccine

3.1.1.1 Lack of awareness of cervical cancer, HPV or the HPV vaccine

Across the three South Asian groups, the majority of participants had not heard of the terms 'human papillomavirus', 'cervical cancer' or 'HPV vaccine' (or 'cervical cancer vaccine'). This lack of awareness was a commonly reported barrier to HPV vaccination among

the South Asian mothers, regardless of their education level and years of residence in Hong

Kong (HK).

Is cervical cancer another name for uterus cancer? I have heard about uterus cancer, blood cancer and breast cancer, but I have never heard about cervical cancer. (Nepalese mother, N-P13: received tertiary education, 10 years of residence in HK, daughter did not receive HPV vaccination)

Among the South Asian mothers whose daughters had not yet received an HPV vaccine,

the most commonly reported reason was that the mothers were not aware of the HPV vaccine

and thus, were unable to act on vaccinating their daughters.

We just heard about this [HPV vaccination] today. We didn't know about this before. We didn't know that we could get a vaccination for this disease. We have lived in Pakistan for many years, where there are also people who are suffering from this [HPV], but no one talks about vaccinations or about the fact that there are vaccinations for this disease. We just heard about it. That is why [our daughter has not gotten vaccinated]! (Pakistani mother, P-P9: received secondary education, 18 years of residence in HK, daughter did not receive HPV vaccination)

3.1.1.2 Lack of knowledge of cervical cancer and the HPV vaccine

The South Asian mothers were also found to have poor knowledge of cervical cancer and the HPV vaccine, regardless of their education level and duration of residence in Hong Kong. In general, they displayed knowledge deficits regarding 1) HPV-related information, including the route of HPV transmission and the role of HPV infection as a risk factor for cervical cancer; 2) cervical cancer-related information, including the various risk factors for cervical cancer and its signs and symptoms; 3) HPV vaccine-related information, including the recommended age for HPV vaccinations, efficacy, potential side effects, cost and schedule of the HPV vaccine; 4) relevant practical information for arranging a HPV vaccination, including venues that offer HPV vaccinations and the procedures required for arranging a vaccination. This lack of knowledge on multiple areas related to HPV vaccinations could act as significant barriers that either stop or delay mothers from vaccinating their daughters. I actually didn't know about the side effects of the vaccine. I simply received information about the vaccine from the school. The information stated that the vaccine was effective in preventing cervical cancer but did not present further details on how the vaccine worked in the body or its side effects. That's why I stopped my daughter from getting the vaccine and told her "Let's wait and find out more information. Let's not hurry." (Indian mother, I-P11: received secondary education, 40 years of residence in HK, daughter did not receive HPV vaccination)

Without understanding in detail, we will not allow [our daughter to be vaccinated]. (Nepalese mother, N-P23: received secondary education, 15 years of residence in HK, daughter did not receive HPV vaccination)

3.1.1.3 Misconceptions regarding HPV and cervical cancer

Some participants had misconceptions about HPV and cervical cancer. For example, one Nepalese mother thought that HPV was a respiratory virus, whereas an Indian mother had apparently confused HPV with Hepatitis B. The South Asian mothers often confused cervical cancer with uterus cancer and ovarian cancer.

3.1.2 Low level of perceived susceptibility of their daughters to HPV and low level of perceived need for their daughters to receive HPV vaccinations

In general, Indian and Pakistani mothers reported a lower level of perceived susceptibility of their daughters to an HPV infection or cervical cancer than Nepalese mothers. Only Pakistani mothers reported a significantly lower level of perceived need for vaccinating their adolescent daughters. The mothers' perceived susceptibility of their daughters to cervical cancer and the perceived need for their daughters to be vaccinated were generally linked to their daughters' ages and sexual activity.

Most Indian mothers could not predict their daughters' susceptibilities to cervical cancer as they lacked the necessary knowledge for making such a judgment. Among Indian mothers who did make a prediction, most perceived their daughters to have low level of susceptibility because they believed that their daughters would be sexually inactive at a young age. Very few Indian mothers believed that their daughters were at risk of having cervical cancer. The Indian mothers who reported a high level of perceived susceptibility either had a family history of abnormal pap test results or attributed this higher level of perceived susceptibility to environmental factors.

I think the lifestyles of [South] Asians or Indians living in Hong Kong are very different from those of the Chinese population...I think [South] Asians are far less affected than the Chinese. (Indian mother, I-P2: received tertiary education, 13 years of residence in HK, daughter received HPV vaccination)

Pakistani mothers reported low level of perceived susceptibility overall, regardless of their

duration of residence in Hong Kong; the only exceptions were mothers who had a family

history of cervical cancer and those who perceived their children to have unhealthy lifestyles.

The most frequently reported reasons for the low level of perceived susceptibility among this

population included the Muslim traditions of remaining sexually inactive prior to marriage and

of women being committed to single sex partners (i.e., their husbands) after marriage.

As we are Muslim parents, we are strict in ensuring that our children are not having sexual relations with any other people before marriage. We are also worried about our children's diet, exercise and sleeping habits, and are concerned about their bad habits of chatting on the mobile phone for extended periods. (Pakistani mothers, P-P1: received primary or lower level of education, 21 years of residence in HK, daughter did not receive HPV vaccination)

In general, Nepalese mothers reported higher levels of perceived susceptibility than Indian

and Pakistani mothers. The most frequently cited reason for this was their belief that there were

chances of their children engaging in sexual activity at younger ages. Another reason was the

unhealthy lifestyles of their children.

If it's not genetic, then I think all individual girls stand a chance [of HPV infection] because they will have boyfriends in future, given their surrounding environment; just like their lack of exercise, food, smoking and other bad habits. I think all children will experience this [HPV infection] at least once. (Nepalese mother, N-P1: unknown education level, 20 years of residence in HK, daughter received HPV vaccination)

The mothers' perceived needs for their daughters to receive HPV vaccines were closely related to the age and sexual activity of their daughters. Most Indian and Nepalese mothers thought that the HPV vaccine should be administered at the age of puberty. The Indian mothers reasoned that during the period of puberty, their children would become mature enough to understand the HPV vaccine information provided. In contrast, the rationale shared by Nepalese mothers was that their daughters would begin to have boyfriends and potentially engage in sexual activities. Pakistani mothers consistently believed that the HPV vaccine was best administered at either just before or after their daughters got married, which usually corresponded to the age of 20 or above. This was in accordance with the low level of perceived susceptibility of their daughters contracting HPV infections before marriage. As their Muslim culture prohibited sexual intercourse before marriage, Pakistani mothers were confident that their daughters would remain sexually inactive at young age and therefore regarded HPV vaccinations to be unnecessary for adolescents. The lower level of perceived need for vaccination among Pakistani mothers potentially explained the additional finding that this group had the lowest number of mothers with positive vaccination uptake of or positive vaccination intention for their daughters.

If they are not married, it is fine for girls not to receive this vaccination until they reach 18 ...it also means that they don't engage in any sexual activities. (Pakistani mother, P-P6: received primary or lower level of education, 15 years of residence in HK, daughter did not receive HPV vaccination)

3.1.3 Concerns about the safety and side effects of the HPV vaccine

Concerns about the safety and side effects of the HPV vaccine was reported as one of the barriers to positive vaccination intention among Nepalese and Pakistani mothers, but not among Indian mothers.

The Indian mothers generally perceived the HPV vaccine to be safe and only had mild concerns regarding the side effects of the vaccine. Although these mothers understood that the HPV vaccine carried potential side effects, they perceived these side effects to be mild and temporary. The specific side effects of the HPV vaccine that the Indian mothers mentioned were delayed development and the effects on puberty. The Indian mothers appreciated the protective effects of the HPV vaccine and considered the benefits of the HPV vaccine to outweigh the potential side effects. Thus, the Indian mothers' concerns about the side effects of the HPV vaccine were less likely to hamper their intention for their daughters to receive vaccinations.

I heard that some girls fainted after taking the vaccine because some children experienced stronger side effects. Some also had nausea or vomiting, but this lasted for a couple of hours and the children were completely fine afterwards. So, [I have] nothing to worry about. (Indian mother, I-P2: received tertiary education, 13 years of residence in HK, daughter received HPV vaccination)

Even though some Nepalese mothers perceived the side effects of the HPV vaccine to be mild, over one quarter of all Nepalese mothers refused to vaccinate their daughters unless their concerns regarding the side effects of the vaccine were completely addressed. The Nepalese mothers were mostly concerned with one side effect in particular: the perceived risk of infertility. However, concerns about side effects hampered mothers' vaccination intention, even if they believed the vaccine to be safe, when they lacked sufficient information about the vaccine.

I think that if the vaccine is approved by the Government, then it will of course be safe. But the thing is, I want to know the side effects; I want to know the side effects because some people may experience some, such as dizziness or nausea. Although dizziness and nausea are common side effects, others side effects such as rapid heartbeats are dangerous. Those are the kinds of side effects that I want to know about...No, I won't [vaccinate my daughter] before understanding the side effects. I won't. (Nepalese mother, N-P25: received secondary education, 23 years of residence in HK, daughter did not receive HPV vaccination)

The Pakistani mothers had strong concerns about the side effects of the HPV vaccine and displayed a lack of confidence in the vaccine's safety. The Pakistani mothers were specifically concerned about the perceived side effects such as infertility, neural damage, menstrual irregularity and fevers. Moreover, several Pakistani mothers questioned the safety of the HPV vaccine as they were worried about 'hidden' side effects (i.e., side effects that had not been reported to the public or that had not yet been discovered). These concerns over the side effects and safety of the vaccine hampered the vaccination intention of the Pakistani mothers. One mother even insisted upon delaying her daughter's vaccination, despite recognising that by

doing so, she risked the chance of her daughter being no longer eligible to receive the free

vaccination provided by the Government in future.

Yes, until we have information about the [vaccine's] side effects, we are not going to make the decision [to vaccinate our daughter], because we should know this... (Pakistani mother, P-P2: received primary or lower level of education, 8 years of residence in HK, daughter did not receive HPV vaccination)

As I have heard, the HPV vaccine is new and was introduced just two years ago during the Childhood Immunisation Programme. I cannot yet decide [to vaccinate my daughter] even if it is free, because I don't know whether there might be some hidden side effects. The chances of this happening are actually just fifty-fifty and I want to wait a few years to see [how the situation develops]. If I'm satisfied in future, I will vaccinate my daughter, even if I have to pay. I don't want [things to go wrong] because it is related to the cervix. It is quite a sensitive part and if my daughter really had a reaction [to the vaccination] she would "kill" me in future (laugh). (Pakistani mother, P-P22: received tertiary education, 11 years of residence in HK, daughter did not receive HPV vaccination)

3.1.4 Concerns about the cost of the HPV vaccine

The Family Planning Association has reported that the total cost of an HPV vaccination for girls below the age of 15, who require 2 doses, is approximately HK\$4220, whereas the total cost for girls aged 15 and above, who require 3 doses, is approximately HK\$5880. Although South Asian mothers had the intention to vaccinate their daughters in the future, the high cost of the vaccination and lack of available financial subsidies were one of the main barriers to their intention to vaccinate. This was especially true for Nepalese and Pakistani mothers.

Indian mothers viewed the high cost of HPV vaccination as a burden to their families. However, this financial concern did not hamper their intention to vaccinate their daughters. Although they regarded the cost of vaccination to be high, most Indian mothers, regardless of their household income, were willing to vaccinate their daughters at their own expense if required, because they felt that it was crucial to protect their daughters from cancer or diseases. Only one Indian mother with a low family income expressed that she would delay vaccinating her daughter if she needed to pay for the expenses as she could not afford the cost. I am actually worried about the cost, but I will still pay for it if it is not provided by the Government. This is important for the safety of my child. (Indian mother, I-P12: received tertiary education, 25 years of residence in HK, daughter did not receive HPV vaccination)

Of course, I want to get my daughter vaccinated. However, I will have to think about it because it is a very high cost for a vaccine. It is a big concern. (Indian mother, I-P3: received secondary education, 13 years of residence in HK, daughter did not receive HPV vaccination)

Among the Nepalese and Pakistani mothers, the cost of HPV vaccination was more frequently reported as a barrier to their intention to vaccinate their daughters in future if no financial subsidies were available. Compared with Indian mothers, significantly more Nepalese and Pakistani mothers reported that they did not plan to vaccinate their daughters as they could not afford the financial expenses of HPV vaccination.

3.1.5 Lack of recommendations for the HPV vaccine from healthcare professionals

All the South Asian mothers in this study regarded healthcare professionals to be the most trustworthy source of health information, including information about the HPV vaccination. Although they trusted the advice of healthcare professionals, none of them had received recommendations from healthcare professionals about HPV vaccinations when they accompanied their daughters to medical consultations.

My daughter is 16 years old and when she was 15, she had more and thicker discharge. I took her to general outpatient clinic, where the doctor said that it was due to hormonal change and that it was not a reason for concern...I am still worried because it still happens to her. Sometimes when I see her sanitary napkins, I see a brownish discharge. (Nepalese mother, N-P14: received tertiary education, 13 years of residence in HK, daughter did not receive HPV vaccination)

My daughter is 10 years old and she experiences abdominal pains from time to time. She had a dirty discharge, a mixture of water and blood. Her abdomen hurt so bad that she also could not walk. She has been going for regular medical check-ups that involved an ultrasound and follow up...She was not given any medicine, only a follow-up. (Nepalese mother, N-P18 received primary of lower level of education, 23 years of residence in HK, daughter did not receive HPV vaccination)

Although the daughters described in the above scenarios did not show definite symptoms

of cervical cancer, they attended consultations for symptoms related to gynaecological issues.

Such consultation sessions could be conducive to initiating recommendations for HPV vaccination. However, the healthcare professionals did not provide any information about HPV vaccination and thus, opportunities to cue mothers and daughters to action were missed.

3.1.6 Consideration of family support for their daughters to receive HPV vaccination

Aside from doctors' advice, family members also had a significant influence on South Asian mothers' decisions to vaccinate their daughters against HPV. In Indian and Nepalese families, decisions about vaccinating daughters were the results of joint decision-making involving both mothers and fathers, though in most cases the mothers had the autonomy to make the final decision on the issue.

They [husbands] are cooperative. They say that since we are the ones to take care of the children, they will support our decisions on actions that are beneficial to our daughters. (Nepalese mother, N-P2: unknown education level, 14 years of residence in HK, daughter received HPV vaccination)

Although joint decision-making by both parents was observed in Pakistani families, Pakistani mothers, regardless of their duration of residence in Hong Kong, felt the obligation to seek consent from their husbands on the decision to vaccinate their daughters against HPV. That is, the fathers played a major role in making decisions on vaccinations in Pakistani families. If fathers did not give their consent, the mothers tended to follow their decisions and abandon the idea of vaccinating their daughters.

Yes, when making decisions, my husband's decision is important. If he does not agree, it will affect my capacity to take this decision. (Pakistani mother, P-P11: received secondary education, 4 years of residence in HK, daughter did not receive HPV vaccination)

3.1.7 Religious and cultural factors

3.1.7.1 Islamic religion

All the South Asian mothers reported that their religious beliefs did not restrict their vaccination practices. They shared those Islamic teachings even recommended taking

precautions and receiving treatments for diseases. Nonetheless, the perceptions of HPV vaccination held by Muslim mothers were indirectly affected by their Islamic religion.

Pakistani mothers expressed that their religion, Islam, taught a pattern of behaviours for living and maintaining a healthy body. About marriage and sexual relationships, Islamic teachings advise people to refrain from extra-marital sexual intercourse. The rationale for this was that although the body could 'clean and purify' viruses that were transmitted during sexual intercourse, having sex with multiple partners was deemed a 'viral relationship' that could weaken this 'self-cleansing ability' of the body, which could in turn lead to the contraction of sexually transmitted diseases (STD). This Islamic perception of the body's ability to purify viruses that cause STDs when one is limited to a single sexual partner could account for the Pakistani mothers' low perceived susceptibility of their daughters to HPV infections.

As we are Muslim, our daughters will be ready for marriage when they are 18–20 years old. That is the time when they can start thinking about having boyfriends. By then, they will soon be married and only attached to their husbands. So they will not have anymore "viral relationships". (Pakistani mother, P-P12: received primary or below level of education, 4 years of residence in HK, daughter did not receive HPV vaccination)

3.1.7.2 Conservative attitudes to requesting information from or communicating health issues to doctors

Indian mothers trusted their doctors' advice but were not active in seeking cancer-related health information from doctors. Some mothers reported that Indians considered discussing cancer, especially in public, to be a form of taboo. Therefore, they did not actively seek cancerrelated information from their doctors. For similar reasons, Nepalese mothers did not actively communicate with doctors in general.

In India, everybody is afraid to talk about cancer. We don't like to talk about it openly. We hate this word. (Indian mother, I -P5: received tertiary education, 13 years of residence in HK, daughter did not receive HPV vaccination)

Just like my sister said, I have irregular periods of menstruation, but I am afraid to tell the doctor. I have even gone to the hospital and returned [gave up on doing so] because of a fear of the diagnosis. (Nepalese mother, N-P2: unknown education level, 14 years of residence in HK, daughter received HPV vaccination)

3.1.8 Language barriers to accessing health services

South Asian mothers faced some language barriers when they tried to access health services. Most of the Indian mothers could effectively communicate in English. However, some of them experienced problems in finding English-speaking nurses or healthcare staff. The Indian mothers reported that not all the nurses (or healthcare staff) could speak English and that this hampered their intention to use healthcare services during emergencies.

The first problem is that whenever you call the hospital they always speak in Chinese. Not all the nurses can speak English. (Indian mother, I-P2: received tertiary education, 13 years of residence in HK, daughter received HPV vaccination)

The language barrier faced by the South Asian mothers even caused them problems in arranging HPV vaccination for their daughters. According to an Indian mother who could speak fluent English, she experienced problem in communicating with the Cantonese speaking hospital staff when she tried to book HPV vaccination for her daughter on phone.

When I call to book the vaccine last time, they just kept me in queue and were passing my call several times but could not connect me to the one who could speak English well..... If these things (HPV vaccination) are arranged by schools, then these problems (language barriers) are taken care of. But if you do it yourself, you need to book an appointment, you need to explain if you are from a low income family or have student subsidy which takes a very long time. So, this communication problem is always here. (Indian mother, I-P2: received tertiary education, 13 years of residence in HK, daughter received HPV vaccination from school.)

Most Pakistani mothers required the services of an interpreter during the focus group interview. These mothers faced mild to significant language barriers, which hampered their access to health services. Pakistani mothers with better standards of English faced a mild language barrier because they could understand their doctors' instructions if the doctor communicated with them in basic English. However, as most Pakistani mothers had a poor grasp of the English language, they needed their husbands to accompany them or needed to use an interpreter when visiting health services. In addition, the Pakistani mothers expressed that they had no choice but to use private general practitioners instead of the Government general outpatient clinic (GOPC) because although they needed their husbands to help communicate with healthcare staff, the long waiting times at the GOPCs could not accommodate their husbands' working hours. Thus, their choice of health services was limited by a language barrier.

I prefer private clinics because I have a problem with the language and my husband needs to accompany me, but he does not have much time to wait in the long queues at Government hospitals. (Pakistani mother, P-P11: received secondary education, 4 years of residence in HK, daughter did not receive HPV vaccination)

Although an interpreter service was available at the clinics, most of the South Asian mothers expressed that they needed to request this service at least 1 week prior to their appointments. Furthermore, the availability of an interpreter service was not guaranteed, especially at the emergency department. The mothers had to cancel their medical appointments if interpreter services could not be arranged.

At times, the interpreter will not answer the call, even if you need and want to use the service. Once, I needed to speak to an interpreter, but as no one answered I eventually missed my appointment. The next appointment was arranged for me a year later. (Pakistani mother, P-P7: received secondary education, 15 years of residence in HK, daughter did not receive HPV vaccination)

In general, South Asian mothers who experienced a language barrier had limited access to health services, including doctors' consultation services, emergency services, screening services and vaccination services. They also experienced problems in understanding doctors' explanations during the consultations, which could limit their ability to receive cancer or vaccination information from doctors if the information was provided.

3.2 Perceived enablers of South Asian mothers for vaccinating their daughters

The enabling factors that South Asian mothers perceived as facilitating their daughters' vaccinations against HPV were 1) trustworthy sources of HPV vaccine information; 2) a high level of perceived benefit of HPV vaccination; 3) a high level of perceived severity of HPV infection and cervical cancer; 4) provision of subsidised vaccinations; and 5) School- or Government- arranged vaccination programmes.

3.2.1 Trustworthy sources of HPV vaccine information

Most of the South Asian mothers were not aware of the availability of an HPV vaccine. Most mothers who heard of the vaccine and demonstrated positive intention to vaccinate their daughters had received information about the vaccine from their daughters' teachers or schools or their own previous experiences with pap smears. The remaining participants obtained information from health talks organised by NGOs or from individuals (i.e., their friends or relatives) who had received the HPV vaccine.

To be frank, I didn't hear about this virus until last year, when my daughter entered Primary 5 and I received the consent form for her vaccination. I was reluctant at first because I was a little afraid of the vaccination. Initially I refused to let my daughter receive the vaccination. My daughter's teacher then asked me to visit the school, where they explained everything to me. I learned that the vaccination was beneficial to my daughter's health. I was also informed that it was meant to prevent cervical cancer.....they [the school] eventually convinced me, so I let my daughter take the vaccine. (Nepalese mother, N-P2: unknown education level, 14 years of residence in HK, daughter received HPV vaccination)

Yes, I have known about it for 2–3 years because my sister's daughter had already taken the vaccine and my sister told me that I needed to get it for my daughter too. (Indian mother, I-P8: received tertiary education, 13 years of residence in HK, daughter did not receive HPV vaccination)

The South Asian mothers shared a common preference for channels of receiving health

information. In general, they preferred to receive health information from health talks,

community centres, healthcare professionals, their daughters' teachers or school and health

centres.

We can receive health information from the places that we visit for health services for childcare, such as the Maternal and Child Health Centres. This should be an easier and more convenient way to distribute information. I think that we can also get such information from the hospital and the different ethnic minorities service centres. (Pakistani mother, P-P24: received tertiary education, 10 years of education, daughter did not receive HPV vaccination)

Most of the mothers were willing to participate in health talks organised by schools or community centres as they often gathered in community centres. Most mothers expressed a preference for face-to-face health talks, where they could benefit from opportunities to ask questions in response to any of their queries. They also shared that they would trust the content of the health talks if the talks were conducted by healthcare professionals.

It [the health talk] should be conducted in the same manner as this current interview, where an interpreter has been arranged, allowing us to understand the information more deeply. The timing [of this interview] is also convenient because we are not rushed and can better digest the information. (Pakistani mother, P-P1: received primary or lower education, 21 years of residence in HK, daughter did not receive HPV vaccination)

Schools and teachers were another reliable source of information for the mothers. However,

the format for information-sharing was found to be important. In the focus group interviews, it

was noted that many South Asians were unclear about the vaccination status of their daughters.

They knew that their daughters had received vaccinations when they were in Primary 5 or 6,

but did not know the names of these vaccines or any related information in the information

sheets delivered by the school. However, mothers who had directly communicated with

teachers about HPV vaccinations apparently retained substantially more useful information.

The mothers also expressed a preference for in-depth information on the HPV vaccination.

'They hand out the information sheets in school. There is also one Pakistani teacher in the school...this is good because they also inform us of the name of the vaccine. However, we actually cannot remember the remaining information because they don't tell us the details, such as what the vaccine is for. It would be better if they briefed us on this information.' (Pakistani mother, P-P1: received primary or lower education, 21 years of residence in HK, daughter did not receive HPV vaccination)

3.2.2 High level of perceived benefit of HPV vaccination

Many South Asian mothers perceived a high level of benefit of vaccinating their daughters. Once the South Asian mothers were aware of the HPV vaccine, many mothers appreciated and had confidence in the HPV vaccine's ability to protect their daughters from cervical cancer. Both Indian and Nepalese mothers shared that they would benefit from the relief of knowing that their daughters were protected from cancer. The perceived protection offered by the HPV vaccine was the major factor that elicit the mothers' intention to vaccinate their daughters for those who considered the benefit of HPV vaccine outweigh the potential side effects. We see the long-term benefits. We know it is going to help protect our child. Therefore, I think the pain in the short term is acceptable. So long as we are aware of what the side effects are, we are alright with vaccinating our daughter. (Indian mother, I-P3: received secondary education, 20 years of residence in HK, daughter did not receive HPV vaccination)

3.2.3 High level of perceived severity of HPV infection and cervical cancer

Across the three South Asian groups, the mothers' perceived level of severity of a potential HPV infection or cervical cancer was high. Although Indian and Pakistani mothers tended to perceive the chance of their daughters to have HPV infection or cervical cancer were not high, they perceived the consequences could be severe once their daughter have cervical cancer. This worry could elicit vaccination intention in some of the mothers. Many participants regarded cancer as being a scary, life-threatening and dangerous experience for their daughters. Infertility was another frequently reported physical concern. Some Indian mothers did not want their daughters to receive intolerable cancer treatment, including painful cancer treatments, or the need to remove the uterus. The mothers were also worried that their daughters would experience psychological stress following a cancer diagnosis. Indian and Pakistani mothers expressed worries of an HPV infection eliciting problems with trust in their daughters' future marital relationships as HPV is sexually transmitted. Nepalese mothers specifically expressed their worries that their daughters would be stigmatised as cancer patients, as cancer is typically viewed as a life-threatening disease related to unhealthy lifestyles of patients.

3.2.4 Provision of subsidised vaccination

Most of the South Asian mothers expressed that providing the vaccination free of charge would encourage them to vaccinate their daughters. Especially for mothers who experienced financial constraints, offering the vaccination free of charge could help to remove a major financial barrier to vaccinating their daughters.

'If it is available free of charge and it is for the protection of our daughters, why hesitate?' (Indian mother, I-P2: received tertiary education, 13 years of residence in Hong Kong, daughter received HPV vaccination)

'Perhaps they [the Government]can provide people experiencing financial difficulties with the free vaccination. They can add the HPV vaccine to the list of free vaccination [for all women at suitable age] and it will be helpful, just like they are giving social assistance for families who really need it...to help the families who want the vaccination, they are in trouble so just help them." (Pakistani mother, P-P3: received secondary education, 2 years of residence in Hong Kong, daughter did not receive HPV vaccination)

3.2.5 School- or Government-arranged vaccination programmes

Most of the South Asian mothers expressed that they would be encouraged to vaccinate their daughters if the vaccination was arranged by the Government via the school. The mothers placed their trust in vaccinations that were arranged either by the schools or the Government. Moreover, such arrangements helped address mothers' knowledge deficiencies on where and how to arrange vaccinations for their daughters. They also helped overcome the practical barriers encountered by the mothers when arranging for vaccinations, such as language barriers and time constraints.

If these things are arranged by scho

If these things are arranged by schools, then the problems are taken care of. But if you have to do it yourself, you will need to book an appointment, explain whether or not you are from a low-income family or have access to a student subsidy. These procedures take a very long time. Hence, there is always a problem with communication. (Indian mother, I-P2: received tertiary education, 13 years of residence in HK, daughter received HPV vaccination)

I have to look for a way to get this [the HPV vaccine] and I need the time. If all of it is delivered by the school, then it is quite a big relief for me. (Pakistani mother, P-P24: received tertiary education, 10 years of residence in HK, daughter did not receive HPV vaccination)

Part B Findings on Chinese mothers

3.3 Perceived challenges faced by Chinese mothers in vaccinating their daughters

All of the Chinese mothers reported positive intention to vaccinate their daughters. Yet,

they faced some challenges in making the decision to vaccinate their daughters against HPV.

The perceived challenges were 1) lack of knowledge about cervical cancer or the HPV vaccine

and 2) concerns about the cost of the HPV vaccine.

3.3.1 Lack of knowledge of cervical cancer or the HPV vaccine

All the Chinese mothers were aware of cervical cancer and the HPV vaccine. Chinese mothers had the knowledge of the following matters: 1) HPV-related information, including the route of HPV transmission and HPV genotypes; 2) cervical cancer-related information, including risk factors of cervical cancer; and 3) HPV vaccine-related information, including the indications, benefits and vaccination schedule. However, they did not have enough knowledge on the extent of efficacy, side effects and age of HPV vaccination. Chinese mothers perceived their knowledge of the HPV vaccine to be inadequate and incomplete, despite of their high education level.

My knowledge was obtained piece-by-piece from various sources, and I don't have a full picture [of the HPV vaccine]. No one told me that my daughters could get vaccinated when they reached the age of [attending] Primary 5 [classes]. I think that I need to obtain more knowledge. I feel that my concepts are vague and I don't have a clear education [on the subject]. (Chinese mother, C-P3: received tertiary education, daughter did not receive HPV vaccination)

My knowledge came from the Government. When the girls reach 9 years old or [begin attending] Primary 6, the Government provides a handout to inform you that this vaccine is available. I know girls need to have this protection. However, I don't have knowledge on the exact details [of the HPV vaccine]. (Chinese mother, C-P8: received tertiary education, daughter received HPV vaccination)

3.3.2 Concerns about the cost of the HPV vaccine

Although most Chinese mothers claimed that the cost of HPV vaccine would not stop them

from vaccinating their daughters and that they were willing to vaccinate their daughters at their

own expense provided the vaccine was effective, some mothers revealed that the cost could be

a factor that delayed their vaccination decisions for their daughters.

As the cost (of the HPV vaccine) is really high, [if I need to pay for the cost] I would only vaccinate my girls when it is necessary. (Chinese mother, C-P10: received tertiary education, daughter did not receive HPV vaccination)

If I need to pay for the cost, I will delay the vaccination for my daughter. Maybe [I will] first ask my daughter when she is mature enough. (Chinese mother, C-P11, received secondary education, daughter did not receive HPV vaccination)

3.4 Perceived enablers of Chinese mothers for vaccinating their daughters

The perceived enablers of the Chinese mothers were 1) recommendations from healthcare professionals; 2) trustworthy sources of HPV vaccine information; 3) a high level of perceived susceptibility to the disease and need to vaccinate; 4) a high level of perceived benefits of the HPV vaccine; 5) perception of the HPV vaccine as safe; and 6) School- or Government-arranged vaccination programmes.

3.4.1 Recommendations from healthcare professionals

One-third of the Chinese mothers participating in our focus groups had approached their doctors for advice on HPV vaccination and received recommendations from their doctors to vaccinate their daughters. The recommendations from the doctors positively affected the mothers' intention to vaccinate their daughters.

My family member is a healthcare professional. He strongly recommended the vaccine, so I have received the vaccination myself. As I know that the vaccine can effectively protect someone from cervical cancer, I understand the need to get vaccinated. Now that I have [a] daughter of my own, I asked my family member [who is a healthcare professional]. After the consultation, I understood why they recommended vaccination at Primary 6. As children's first sexual experiences now begin at younger ages, they suggest vaccination at this age as a precaution. I think it is okay to get vaccinated; it is a precaution. Therefore, I am very open-minded to let my daughter receive the vaccine. (Chinese mother, C-P5: received tertiary education, daughter did not receive HPV vaccination)

Although some of the Chinese mothers had received advice from healthcare professionals

on the HPV vaccine, the mothers had to actively seek the advice. The mothers would not have

received advice from the healthcare professionals if they had not actively asked for it. Such

situations occurred even in the Student Health Service Centre.

'When my daughter attended the [check-up at the] Student Health Service Centre, a doctor performed a preliminary assessment of her sexual development. Yet, we did not receive information from the doctor regarding HPV vaccination.' (Chinese mother, C-P8: received tertiary education, daughter received HPV vaccination)

3.4.2 Trustworthy sources of HPV vaccine information

Chinese mothers preferred to receive health information from the following sources: doctors, Government websites and printed materials issued by schools or the Government. Chinese mothers were confident of the trustworthiness of the information, and they considered these sources to be important enablers of parental decisions.

'My daughter has not yet received the vaccination from the school, so I don't know how the school will arrange it. I expect the school will provide us with an information sheet prior to vaccination, to provide information on the efficacy, safety and side effects of the vaccine. That will enable us to understand the information in one go, with no need to search the web. Some information from the web is not accurate; for example information on [the online discussion forum] Baby Kingdom may be wrong. If we have an official channel from which to receive information, then the parents will understand the pros and cons of vaccination in one go. I think it is the most effective method of facilitating parents' decision-making.' (Chinese mother, C-P5: received tertiary education, daughter did not receive HPV vaccination)

3.4.3 High level of perceived susceptibility to the disease and need to vaccinate

Many of the Chinese mothers perceived their daughters to be susceptible to HPV infections. These mothers also perceived a need to vaccinate their daughters during the daughters' adolescence. The most frequently reported reasons were that mothers were more open-minded to sexual relationships or complicated social lives of their daughters. One of the mothers perceived a risk of her daughter contracting HPV from the daughter's future spouse, even if the daughter only had a single sexual partner. Other reasons were environmental factors and the perception of cancer as becoming increasingly common. The high level of perceived susceptibility encouraged the Chinese mothers' intention to vaccinate their daughters. The perceived susceptibility to the disease and the need for vaccination were generally linked with the daughters' age and sexual activity status.

'I don't know whether cervical cancer is hereditary, like breast cancer. Besides, I think that cancer is becoming more common, so I don't know. I don't want her to be at risk [of cervical cancer], so it is good to get vaccinated. We don't know what her future lifestyle will be like. Everybody will study abroad in the future, so you never know how complicated their lifestyles will be.' (Chinese mother, C-P2, received tertiary education, daughter did not receive HPV vaccination)

'Actually, we cannot foresee how our daughters will be in the future. I cannot predict how her future partner will be. If her partner is infected with the virus, then my daughter can get infected even though she behaves herself. Therefore, vaccination is a must to protect the children. No matter her susceptibility, I think vaccination should be done.' (Chinese mother, C-P5: received tertiary education, daughter did not receive HPV vaccination)

The Chinese mothers perceived the need to vaccinate their daughters during adolescence.

Some mothers did not perceive the need to vaccinate their daughters against HPV during early

adolescence, but still perceived the need to vaccinate their daughters during mid- or late

adolescence as the mothers anticipated the possibility of their daughters being sexually active

by that age.

It would have been too early if my daughter was 6–7 years old, but my daughter is 10 years old already, she is mature enough. (Chinese mother, C-P9: received secondary education, daughter received HPV vaccination)

I don't think she will have sex too early, so I will not vaccinate her as early as 9 years old. I don't see the need for early vaccination, and I don't understand why the Government suggests vaccination so early. However, I won't delay the vaccination till 18 years old, as it will be too late by then. Life cannot be predicted, I may not be able to control my daughter. So I will vaccinate her when she is in Form 3 or Form 4. A practical question, I don't see the need to vaccinate my daughter when she is 9–10 years old, but anything can happen when she reaches Form 4 or Form 5, as she will be independent by then. (Chinese mother, C-P12: received tertiary education, daughter did not receive HPV vaccination)

3.4.4 High level of perceived benefits of HPV vaccination

Most of the Chinese mothers had a high level of perceived benefits of vaccinating their

daughters against HPV. The most reported perceived benefit of the HPV vaccine was

protecting their daughters against cervical cancer.

The protection is not short-term, like the flu vaccine which only lasts for 1 year. It is a lifelong protection for her. May be a booster will be needed in the future; we cannot tell. As the vaccine can offer her lifelong protection, even if the cost is high, I think it is worth taking. (Chinese mother, C-P12: received tertiary education, daughter did not receive HPV vaccination)

3.4.5 Perception of the vaccine as safe

In general, Chinese mothers regarded the HPV vaccine as being safe. Some of the mothers had concerns about the side effects of the vaccine, such as effects on puberty. However, concerns about the side effects did not hamper their vaccination intention.

Ten years ago, my children were young and I was concerned about the safety and efficacy of the vaccine. Now the vaccine has been in the market for more than 10 years and I believe that the technology will keep on improving. As no significant side effects have been observed for more than 10 years, I think it is safe to get her vaccinated now. (Chinese mother, C-P8: received tertiary education, daughter received HPV vaccination)

3.4.6 School- or Government-arranged vaccination programmes

School- or Government-arranged vaccination programmes were the most frequently reported perceived enablers for Chinese mothers. These mothers reported that the inclusion of the HPV vaccine in the HKCIP by the Government improved their confidence in the safety and efficacy of the HPV vaccine and increased their perceived need for vaccinating their daughters. The school-arranged vaccination programme also reduced their time constraints in arranging vaccinations for their daughters and spared them the effort of searching for information on the HPV vaccine before making the decision to vaccinate their daughters.

[If the school arranges the vaccination,] then I don't need to apply for a day off to accompany her. My daughter is not mature enough; she needs an adult to accompany her during the vaccination...Therefore, I would need to arrange for a day off to accompany her to receive the HPV vaccine. I would also need to plan for the vaccination timing carefully in view of the possible side effects. (Chinese mother, C-P8: received tertiary education, daughter received HPV vaccination)

If the Government arranges the vaccination, then we don't need to pay for it and we don't need to compare the various available HPV vaccines. I think the Government will choose the most suitable one for the children, as [the Government] would have already made the comparisons. So I think the vaccine they choose would be suitable. (Chinese mother, CP-10: received tertiary education, daughter did not receive HPV vaccination)

3.5 Similarities and differences in the perceived challenges and enablers of South Asian

and Chinese mothers for vaccinating their daughters

Table 1 shows a comparison of the perceived challenges and enablers of South Asian and

Chinese mothers for vaccinating their daughters. Five challenges and enablers were common

across the ethnic groups: 1) lack of knowledge about cervical cancer, HPV or the HPV vaccine; 2) concerns about the cost of the HPV vaccine; 3) trustworthy sources of HPV vaccine information; 4) high level of perceived benefits of receiving the HPV vaccination; and 5) vaccination programmes arranged by the school or the Government. Some challenges and enablers that were only applicable to South Asians, including: 1) lack of awareness about cervical cancer, HPV or the HPV vaccine; 2) concerns about the safety and side-effects of the HPV vaccine; 3) lack of recommendations from healthcare professionals; 4) consideration of family support for their daughters to receive HPV vaccination; 5) religious and cultural factors; 6) language barriers experienced when accessing health services; 7) high level of perceived severity of HPV infections and cervical cancer; and 8) provision of subsidised vaccinations.

| Table 1. A comparison of South Asian and | Chinese mothers' | perceived challenges | and enablers for |
|--|------------------|----------------------|------------------|
| vaccinating their daughters against HPV. | | | |

| Pe | rceived challenges | Indian Mothers | Nepalese Mothers | Pakistani Mothers | Chinese Mothers |
|-----|---|-------------------|---------------------|----------------------|--------------------|
| 1. | Lack of awareness of cervical cancer, HPV or the HPV vaccine | \checkmark | \checkmark | \checkmark | |
| 2. | Lack of knowledge of cervical cancer, HPV or the HPV vaccine | \checkmark | \checkmark | \checkmark | \checkmark |
| 3. | Low level of perceived susceptibility to the disease | \checkmark | | \checkmark | |
| 4. | Low level of perceived need to vaccinate | | | \checkmark | |
| 5. | Concerns about the safety and side- effects of the HPV vaccine | \checkmark | \checkmark | \checkmark | |
| 6. | Concerns about the cost of the HPV vaccine | | \checkmark | \checkmark | \checkmark |
| 7. | Lack of recommendations from healthcare professionals | \checkmark | \checkmark | \checkmark | |
| 8. | Consideration of family support for their daughters to receive HPV | \checkmark | \checkmark | \checkmark | |
| 9. | Religious and cultural factors | \checkmark | \checkmark | \checkmark | |
| 10. | Language barriers to accessing health services | \checkmark | \checkmark | \checkmark | |

| Pe | rceived enablers | Indian Mothers | Nepalese Mothers | Pakistani Mothers | Chinese Mothers |
|----|---|-------------------|---------------------|----------------------|--------------------|
| 1. | Trustworthy sources of HPV vaccine information | \checkmark | \checkmark | \checkmark | \checkmark |
| 2. | Recommendations from healthcare professionals | | | | \checkmark |
| 3. | High level of perceived benefits of HPV vaccination | \checkmark | \checkmark | \checkmark | \checkmark |
| 4. | High level of perceived susceptibility to HPV | | | | \checkmark |
| 5. | High level of perceived need to vaccinate | | | | \checkmark |
| 6. | High level of perceived severity of HPV infection and cervical cancer | \checkmark | \checkmark | \checkmark | |
| 7. | Perception of the HPV vaccine as safe | | | | \checkmark |
| 8. | Provision of subsidised vaccinations | \checkmark | \checkmark | \checkmark | |
| 9. | School- or Government-arranged vaccination programmes | \checkmark | \checkmark | \checkmark | \checkmark |

CHAPTER 4

DISCUSSION

This was the first local study to explore the perceived challenges and enablers encountered by South Asian and Chinese mothers when making the decision to vaccinate their daughters against HPV. Regarding the perceived challenges, our findings showed that certain challenges were common for both South Asian and Chinese mothers. These included the lack of knowledge about cervical cancer, HPV or the HPV vaccine and the mothers' concerns about the cost of the HPV vaccine. Certain enablers were also common to both groups of mothers, such as the reception of trustworthy information from peers, schools, community/health centres or the Government, the high perceived benefits of HPV vaccination and the availability of a school- or Government-arranged vaccination programmes. Some challenges and enablers were unique to South Asian mothers. The distinct challenges they experienced included a lack of awareness of cervical cancer, HPV or the HPV vaccine; concerns about the safety and sideeffects of the HPV vaccine; a lack of recommendations from healthcare professionals; considerations of family members for their daughters to receive HPV vaccination, religious beliefs and cultural factors; and language barriers encountered when accessing health services. Distinct enablers for this group were the high perceived severity of the HPV infection and cervical cancer and the provision of subsidised vaccinations.

4.1 Commonly perceived challenges to and enablers of vaccinating the daughters of South Asian and Chinese mothers

A lack of knowledge about cervical cancer, HPV or the HPV vaccine was a commonly reported factor that hampered the vaccination intention of both South Asian and Chinese mothers in Hong Kong. This finding is consistent with previous studies on ethnic minorities and Chinese mothers in Hong Kong (Taylor et al., 2014; Loke, 2017). Furthermore, Aragones et al. (2016) observed that ethnic minority mothers had less knowledge of vaccine use, number of doses, eligibility for vaccination and the reasons for getting vaccinated. Hamlish et al. (2012) also found that ethnic minority mothers did not know about the links between HPV and cervical cancer. Consequently, these mothers were unlikely to vaccinate their daughters in the absence of adequate cervical cancer- and vaccine-related knowledge.

In our current study, Chinese mothers generally demonstrated better knowledge of the disease and its link to HPV. However, they also showed knowledge deficits related to the vaccine's efficacy and the eligibility criteria for vaccination; this is consistent with the findings of a systematic review of the knowledge of HPV vaccination among Chinese women (Chan et al., 2012). To improve the knowledge of these mothers, promotional campaigns that focus on cervical health and HPV vaccinations should be conducted. Such campaigns can be conducted through community-based educational interventions and in schools through lecture presentations and educational videos. Their content should address the links between cervical cancer, HPV and HPV vaccination and have detailed information on the HPV vaccine, such as eligibility criteria and stipulated dosage. In particular, the benefits of HPV vaccines in preventing HPV infections and HPV-related cancer should be highlighted. This could further enhance mothers' perceived benefits of HPV vaccination and subsequently increase their intention to vaccinate their daughters.

In addition, it was observed that both South Asian and Chinese mothers valued the information received from trusted sources such as the Government departments and schools and health talks conducted by healthcare professionals. This has also been observed in previous studies (Chan et al., 2019; Ferrer et al., 2014). Rapid technological advances and the increasing availability of different digital and social media platforms have changed the ways in which people acquire and receive information. However, there is still uncertainty about the reliability of information available online. Therefore, individuals tend to search for and obtain information from more reliable sources, such as authoritative Government organisations and

from well-established individuals with relevant knowledge (Ferrer et al., 2014). To further enhance the effects of the health promotion campaign in improving mothers' knowledge and consequently their intention to vaccinate their daughters, healthcare professionals such as nurses, doctors or trained schoolteachers can deliver relevant information and thereby increase the mothers' confidence in the credibility of the information delivered.

Concerns about the cost of the vaccine were a common challenge perceived by both South Asian and Chinese mothers. This was consistent with the findings of Gerend et al. (2013) and Warner et al. (2015), who reported that concerns about the cost of the vaccine were a barrier to vaccination among ethnic minorities in the United States. Choi et al. (2013) reported that the cost of the vaccine was also a major barrier for local Chinese mothers to vaccinate their daughters and that low-income families could not afford the cost of the vaccination if no financial subsidies were available. The introduction of the HPV vaccine to the HKCIP at the start of the 2019 school year was a boon for mothers as this programme enabled eligible Primary 5 and 6 school students of suitable age to receive the HPV vaccine free of charge on a voluntary basis (Department of Health, 2019). All the mothers in this study agreed that this was an important enabler that enhanced their intention to vaccinate their daughters.

A local study by Wang et al. (2017) suggested that the lack of a Government-organised vaccination programme resulted in a persistently low HPV vaccine uptake by adolescent girls in Hong Kong. The findings of this study contribute to our understanding of how school- or Government- arranged vaccination programmes can improve the intention of the mothers to vaccinate their daughters. A previous study conducted by Yuen et al. (2018) revealed that school-based vaccination programme was effective with an average uptake rate of 81.4% (first dose) and 80.8% (second dose) observed among the participating girls aged nine to 14 years. This study also found that parents' preference for their daughters to receive the vaccine at school was a significant positive factor associated with vaccine uptake (Yuen et al., 2018).

Parents who perceived that the HPV vaccine could protect their daughter from getting cervical cancer were more likely allowing their daughter to join the HPV vaccination programme (Yuen et al., 2018). The South Asian and Chinese mothers in this study reported that the school- or Government- arranged vaccination programmes were beneficial in overcoming the time constraints of arranging vaccinations for their daughters. The vaccination programme also overcame the challenges faced by the South Asian mothers in not knowing where and how to arrange vaccinations and the language barriers encountered when arranging for the vaccination. The school- or Government- arranged vaccination programmes also improved the Chinese mothers' confidence in the safety of the HPV vaccine. Therefore, such programmes can help mothers get their children vaccinated. Worldwide studies supported that HPV vaccination is effective in decreasing the prevalence of cervical cancer among women in the US, the UK, Australia and Sweden (Falcaro et al., 2021; Mix, Van Dyne, Saraiya, Hallowell & Thomas, 2021; Machalek et al., 2018; Lei et al., 2020). Moreover, all the above studies supported that the efficacy of HPV vaccine in reducing the risk of cervical cancer is stronger among younger women who had been vaccinated at adolescent age. As the school- or government basedvaccination program can encourage mothers to vaccinate their daughters at adolescent age, their daughters can enjoy the best protection against cervical cancer offered by the HPV vaccine.

Although school- or government- based program is beneficial, daughters who do not fall in the suitable age group are not eligible to receive the vaccine through this programme, and the mothers of these children must search for other sources if they intend to have their daughters vaccinated. The Centre for Disease Control and Prevention (2021) suggests that although HPV vaccination is routinely recommended for adolescents aged 11–12 years in the United States immunisation programme, children should have catch-up vaccinations till age 18 if they are not adequately vaccinated. Studies have revealed that the catch-up HPV vaccination is useful in preventing cervical intraepithelial neoplasia in girls and women aged 14–20 years (Centre for Disease Control and Prevention, 2021; Silverberg et al., 2018). Thus, an HPV vaccination catch-up programme may be considered to extend the coverage to girls and women till age 18–20 years.

4.2 Commonly perceived challenges to and enablers of vaccinating the daughters of

South Asian mothers

Lack of awareness of cervical cancer and the HPV vaccine was reported only among South Asian mothers. This can be explained by the language barrier faced by South Asian mothers and the difference in the preferred sources of information between the South Asian and Chinese mothers. Since the launch of the HPV vaccine in Hong Kong in 2006, its promotion has mainly been done through mass media campaigns (commercial television advertisements, posters in public transport, education leaflets in clinics, etc.) (Department of Health, 2020). These channels are easily and widely accessible by Chinese mothers but not by South Asian mothers. The South Asian mothers reported that they never watched local television programmes and that they had problems in reading materials written in Chinese or English; this finding is consistent with our previous local study (Chan et al., 2019).

The language barrier posed challenges to the South Asian mothers in receiving existing HPV vaccine promotion materials and thus contributed to the lack of awareness of the HPV vaccine. This also serves as a good example of inequity of obtaining health related information and access to preventive health services. To improve awareness, the production and distribution of linguistically appropriate advertisements and posters is needed. These materials should be placed in public areas such as health centres and clinics where South Asian mothers can gain access to and be aware of updates in vaccine development and availability. To better disseminate information to South Asian mothers, we also need a better understanding of the social media platforms that they commonly use.

South Asian mothers reported high concerns about the safety and side effects of the HPV vaccine, which affected their vaccination intention. Studies have reported that concerns about vaccine safety and side effects, such as infertility and irregular menses, were commonly reported barriers for South Asian mothers (Forster et al., 2017; Warner et al., 2015) to vaccinate their daughter against HPV. Chinese mothers had concerns about the vaccine's side effects, but they expressed that their concerns were alleviated by the inclusion of the HPV vaccine in the HKCIP as they trusted the Government. To alleviate the South Asian mothers' concerns about safety and side effects, educational interventions that cover research on the safety of vaccine should be implemented.

Moreover, the common side effects can be listed and explained to psychologically prepare the mothers (Fu et al., 2014). In addition, studies have revealed that experience-sharing and recommendations from friends can enhance South Asian women's utilisation of preventive health services (Chan et al., 2019). South Asian mothers whose adolescent daughters have been vaccinated can be invited to share their vaccination experiences with mothers who are in the process of making vaccination decisions.

A lack of healthcare professionals' recommendations for HPV vaccination was another commonly reported challenge. This is consistent with earlier reports of a lack of healthcare provider recommendations being a major barrier for ethnic minority mothers to vaccinate their daughters in the United States (Aragones et al., 2016; Halmish et al., 2012; Warner et al., 2015). Local studies have also found that South Asian women who received doctors' recommendations were more likely to utilise preventive health services (Chan et al., 2019). South Asian mothers value the recommendations received from doctors and therefore, healthcare professionals are encouraged to recommend clients with eligible daughters to vaccinate their daughters against HPV when conditions are appropriate. Among the South Asian mothers, it was commonly noted that they discussed and sought advice on health-related decisions from their husbands. South Asian women's health behaviours were often influenced by the male members of the family. South Asian women followed the family's advice and sought support from them for decision-making. They may also follow their husbands' advice to avoid conflicts within the family (de Cuevas et al., 2018). This is reflected in our current study; Pakistani mothers tended to follow their husbands' decisions and abandoned their intention to vaccinate their daughters when their husbands did not agree. The major role of the husband in healthcare-related decision-making for children indicates the need for interventions that target fathers as well.

Language barriers in accessing health services have consistently been reported as a challenge both locally and globally by ethnic minorities (Chan et al., 2019; de Cuevas et al., 2018). Our study also supported that language barrier could be a challenge for mothers in arranging HPV vaccination for their daughters. Cantonese and English are the major languages used in Hong Kong. Most healthcare providers speak in Cantonese or English, and the health promotional materials are written in either Chinese or English. South Asians who are not proficient in Cantonese/Chinese or English often encounter difficulties in understanding the materials or expressing their needs when using the services (Chan et al., 2019).

Although interpreter services (both onsite and telephone) are available in Hong Kong, onsite interpretation services are not offered on a 24-hour basis and at times, nobody is available to answer calls when South Asian mothers require telephone interpretation services (Center for Harmony and Enhancement of Ethnic Minority Residents, 2021; HKSKH Lady Maclehose Centre, 2017). This causes many South Asian mothers to either miss their appointments or reschedule appointments to fit their husbands' (who speak English) working hours. For better utilisation and delivery of interpretation services, more efforts should be put into service promotion. More resources should also be allocated to the enhancement of 24-hour

interpretation service, either by phone or for walk-in visit, as suggested by a previous study on the effectiveness of enhancing ethnic minority utilisation of health service (Jacob et al., 2001). If onsite interpretation is not readily available, then trained ambassadors who can speak both Hindi, Urdu or Nepali and English/Cantonese can help with interpretation.

Certain religious and cultural factors were also challenges faced by South Asian mothers to vaccinating their daughters. Religious teachings guide Pakistani mothers' beliefs that their daughters have a lower level of perceived susceptibility to HPV infection and cervical cancer and that their daughters have single sexual partners are not in 'viral relationships'. South Asian mothers also consider health topics related to cancer as cultural taboos and thus do not actively seek advice or discuss the subject openly (de Cuevas et al., 2018). In view of these factors, healthcare professionals should actively offer advice to South Asian mothers during medical consultations. It is also important for healthcare professionals to be culturally sensitive and offer advice that takes the cultural factors into consideration (Chan et al., 2019).

Although concerns about the cost of the HPV vaccine were a commonly perceived challenge by both South Asian and Chinese mothers, only South Asian mothers voiced that the provision of subsidised vaccination would positively impact their vaccination intention. This could be due to the economic characteristics of their monthly household income being either approximately the same or well below the median monthly income in Hong Kong (Census and Statistics Department, 2017). They might have experienced financial constraints and been unable to spare money to pay for the vaccine. Thus, if the cost of vaccine can be subsidised, South Asian mothers would not hesitate and would allow their daughters to get vaccinated. For example, a 3-year HPV vaccination pilot scheme supported by the Community Care Fund was launched in 2016. This scheme offered free or low-cost HPV vaccinations for adolescent girls from eligible low-income families. The scheme ended in June 2019, and around 26,000 girls were vaccinated (around 83.8% of the target age eligible girls) (The Government of the Hong

Kong Special Administrative Region, 2019). In future, similar schemes can be provided for those adolescent girls who missed routine HPV vaccinations from the HKCIP or adolescent girls aged 12–18 from low-income families.

4.3 Social class differences and the HPV vaccination uptake

On the one hand, there was social class difference between the ethnic groups. The monthly household income was generally lower among the South Asian mothers when compared to the Chinese mothers. The education level of the Chinese mothers was generally higher than the South Asian mothers, with more Chinese mothers received tertiary education. On the other hand, the HPV vaccination uptake was similar between South Asian and Chinese groups, despite that a comparatively lower uptake observed among the Pakistani group. Overall, in both South Asian and Chinese groups, the uptake of HPV vaccine was not generally affected by social class differences, though financial concern was observed which delayed our participants' intention to vaccine their daughters.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

To eliminate ethnic disparities in HPV vaccination uptake in Hong Kong, it is essential to understand the challenges that hinder South Asian mothers from enabling their adolescent daughters to be vaccinated. It is also beneficial to compare the factors affecting the intention of HPV vaccination between South Asian and Hong Kong Chinese mothers; this will facilitate a clear understanding of the unique needs of South Asians. The current study revealed that some challenges were common between South Asian and Chinese mothers. These included a lack of knowledge of cervical cancer, HPV or the HPV vaccine and concerns about the cost of the HPV vaccine. There were also some common enablers between South Asian and Chinese mothers. These included receiving trustworthy sources of HPV vaccine information, high perceived benefits of HPV vaccination and the availability of school- or Government-arranged vaccination programmes. Some challenges and enablers were only relevant to South Asian mothers. A lack of awareness of cervical cancer, HPV or the HPV vaccine; concerns for the safety and side-effects of the HPV vaccine; a lack of recommendations from healthcare professionals; consideration of family support; religious and cultural factors; and language barriers to accessing health services were the commonly identified perceived challenges. A high level of perceived severity of HPV infection and cervical cancer and the provision of subsidised vaccination were major enablers that enhanced South Asian mothers' intention to vaccinate their daughters. An understanding of these challenges and enablers can enhance the understanding of healthcare professionals and thus improve their ability to assist South Asians in overcoming barriers to HPV uptake. This study can therefore inform the development of health promotional campaigns or educational interventions and healthcare policies to improve

HPV vaccination uptake by South Asians in Hong Kong, thereby allowing ethnic minorities equal access to health services.

5.2 Recommendations

Based on the study's findings, the following recommendations are made:

5.2.1 Health promotional campaign on cervical health and HPV vaccination should be conducted. These can be conducted through community-based educational interventions and in schools through lecture presentation and educational videos with content on the link between cervical cancer, HPV and HPV vaccination and detailed information on the HPV vaccine, such as eligibility and dosage. In particular, the benefits of HPV vaccines in preventing HPV infections and HPV-related cancer should be highlighted. Moreover, the incidence and mortality rate of the diseases, should be delivered, in order to improve the mothers' perceived severity of the HPV-related diseases.

5.2.2 Health promotional campaign should be delivered by healthcare professionals such as nurses or doctors to enhance mothers' confidence in the trustworthiness of the information delivered. In addition, schoolteachers should be made knowledgeable of cervical health and the HPV vaccine. They can thus help answer queries from the parents of students when they prepare to get their daughters vaccinated through the HKCIP.

5.2.3 The school immunisation team of the Department of Health should organise school-based health talks half a year before implementation of the vaccination programme for each academic year for the mothers of Primary 4 and 5 students. This can help better prepare the mothers and allow time for them to ask and search for more information.

5.2.4 Health promotional materials such as videos, posters and leaflets should be prepared in relevant South Asian languages (e.g. Hindi, Urdu, and Nepali) to facilitate the South Asian mothers' understanding and receipt of HPV vaccine-related information.

5.2.5 To ensure equal access to health-related information, linguistically appropriate health promotional materials such as videos and leaflet should be disseminated via platforms commonly used by South Asian mothers (for example, YouTube, Facebook and WhatsApp). 5.2.6 To ensure equal opportunity in receiving recommendation for HPV vaccination, healthcare professionals should be encouraged to make use of health or disease consultations with South Asian mothers and offer advice on HPV vaccinations for mothers with daughters aged 9–17.

5.2.7 Unvaccinated adolescent girls studying in secondary schools are currently not eligible to receive the vaccine through the HKCIP. We recommend the implementation of a catch-up HPV vaccination programme for all adolescents till age 18 if they are not adequately vaccinated. 5.2.8 To overcome the concerns about the cost of the vaccine and the ineligibility of adolescent girls aged under 18, we recommend that the Government to resume the Community Care Fund and provide subsidised HPV vaccinations to alleviate financial difficulties, especially of South Asian groups. Screening of the financial status of the applicants' families will be required to ensure that Government resources are appropriately allocated to families who are in need.

5.2.9 In view of religious and cultural factors that hamper South Asian mother's intention to vaccinate their daughters, healthcare professionals should be culturally sensitive when offering advice. Training should be offered to enhance healthcare professionals' cultural sensitivity and improve the quality of service provided.

5.2.10 In view of the language barriers experienced by South Asian mothers, resources should be allocated to improve the provision of interpretation services. These include the training of additional medical interpreters and the provision of 24-hour onsite interpretation services.

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APPENDIX 1

Sociodemographic data for Indian participants

| Participant NO. | Vaccination status of daughter*/ Venue of vaccination | Intention to vaccinate daughter ** | Religion | Highest education level | Monthly household income (HK\$) | Years of residence in Hong Kong |
|--------------------|---|--|-------------|-----------------------------------|--|--|
| I-P1 | - | + | Hinduism | Tertiary (Degree or higher) | \$60001 or above | 6 |
| I-P2 | + (From school) | N/A | Islam | Tertiary (Degree or higher) | \$20001- \$30000 | 13 |
| I-P3 | - | + | Hinduism | Secondary | \$5000 or below | 20 |
| I-P4 | - | + | Hinduism | Secondary | \$20001- \$30000 | <1 year |
| I-P5 | - | + | Hinduism | Tertiary (Degree or higher) | \$30001- \$40000 | 13 |
| I-P6 | - | + | Hinduism | Tertiary (Degree or higher | \$20001- \$30000 | 18 |
| I-P7 | - | + | Catholicism | Tertiary (Degree or higher | \$10001- \$20000 | 12 |
| I-P8 | - | + | Hinduism | Tertiary (Degree or higher | \$30001- \$40000 | 13 |
| I-P9 | - | + | Islam | Secondary | \$5001- \$10000 | 4 |
| I-P10 | - | + | Islam | Tertiary (Degree or higher | \$10001- \$20000 | 3 |
| I-P11 | - | + | Islam | Secondary | \$20001- \$30000 | 40 |
| I-P12 | - | + | Hinduism | Tertiary (Diploma) | \$10001- \$20000 | 25 |
| I-P13 | - | + | Hinduism | Tertiary (Diploma) | \$20001- \$30000 | 25 |
| I-P14 | - | + | Islam | Tertiary (Diploma) | \$20001- \$30000 | 25 |
| I-P15 | + (From school) | N/A | Islam | Tertiary (Degree or higher) | \$10001- \$20000 | 19 |
| I-P16 | + (From school) | N/A | Hinduism | Tertiary | \$20001- \$30000 | 14 |

| | | | | (Degree | | |
|-------|---------------|-----|----------|------------|-----------|----|
| | | | | or higher) | | |
| I-P17 | + | N/A | Hinduism | Tertiary | \$30001- | 3 |
| | (From school) | | | (Diploma) | \$40000 | |
| I-P18 | - | - | Islam | Tertiary | \$10001- | 25 |
| | | | | (Degree | \$20000 | |
| | | | | or higher) | | |
| I-P19 | + | N/A | Sikhism | Tertiary | \$5001- | 12 |
| | (From school) | | | (Degree | \$10000 | |
| | | | | or higher) | | |
| I-P20 | - | + | Sikhism | Secondary | \$50001- | 26 |
| | | | | _ | \$60000 | |
| I-P21 | - | - | Islam | Primary | \$5000 or | 12 |
| | | | | or below | below | |
| I-P22 | - | + | Hinduism | Tertiary | Uncertain | 28 |
| | | | | (Degree | | |
| | | | | or higher) | | |

* Vaccination status of daughter ('+': received at least one dose of HPV vaccination; '-': had never received HPV vaccination)

** Vaccination intention ('+': plan to vaccinate daughter against HPV; '-': no plan to vaccinate daughter against HPV; 'N/A': Not applicable since their daughters had already received at least one dose of HPV vaccination)

APPENDIX 2

Sociodemographic data for Nepalese participants

| Participan t NO. | Vaccination status of daughter*/ Venue of vaccination | Intention to vaccinate daughter ** | Religion | Highest education level | Monthly househol d income (HK\$) | Years of residenc e in Hong Kong |
|------------------------|---|--|----------|-------------------------------|---|--|
| N-P1 | + (From school) | N/A | Hinduism | Missing | Missing | 20 |
| N-P2 | + (From school) | N/A | Hinduism | Missing | Missing | 14 |
| N-P3 | - | + | Buddhism | Secondary | \$5001- \$10000 | 21 |
| N-P4 | - | Missing | Buddhism | Secondary | \$10001- \$20000 | Missing |
| N-P5 | + (From school) | N/A | Hinduism | Secondary | \$30001- \$40000 | 20 |
| N-P6 | + (From school) | N/A | Hinduism | Secondary | \$30001- \$40000 | 18 |
| N-P7 | + (From school) | N/A | Hinduism | Secondary | \$20001- \$30000 | 20 |
| N-P8 | + (From school) | N/A | Hinduism | Tertiary (Diploma) | \$30001- \$40000 | 18 |
| N-P9 | + (From school) | N/A | Hinduism | Secondary | \$40001- \$50000 | 22 |
| N-P10 | + (From school) | N/A | Kirat | Tertiary (Diploma) | \$40001- \$50000 | 22 |
| N-P11 | - | + | Hinduism | Tertiary (Diploma) | \$30001- \$40000 | 20 |
| N-P12 | + (From school) | N/A | Other | Secondary | \$30001- \$40000 | 20 |
| N-P13 | - | Missing | Buddhism | Tertiary (Diploma) | \$5000 or below | 10 |
| N-P14 | - | + | Hinduism | Secondary | \$10001- \$20000 | 13 |
| N-P15 | - | + | Buddhism | Primary or below | \$20001- \$30000 | 23 |
| N-P16 | - | + | Hinduism | Secondary | \$20001- \$30000 | 15 |
| N-P17 | - | - | Buddhism | Secondary | \$20001- \$30000 | 14 |
| N-P18 | - | + | Hinduism | Primary or below | \$20001- \$30000 | 23 |
| N-P19 | - | - | Buddhism | Secondary | \$20001- \$30000 | 26 |
| N-P20 | - | - | Buddhism | Primary or below | \$40001- \$50000 | 23 |

| N-P21 | - | - | Buddhism | Secondary | \$20001- | 14 |
|-------|---|---|------------|------------|----------|-----|
| | | | | | \$30000 | |
| N-P22 | - | - | Kirat | Tertiary | \$40001- | 13 |
| | | | | (Diploma) | \$50000 | |
| N-P23 | - | - | Buddhism | Secondary | \$20001- | 15 |
| | | | | | \$30000 | |
| N-P24 | - | - | Buddhism | Primary or | \$30001- | 26 |
| | | | | below | \$40000 | |
| N-P25 | - | - | Protestant | Secondary | \$20001- | 23 |
| | | | | | \$30000 | |
| N-P26 | - | - | Buddhism | Tertiary | \$20001- | 6.5 |
| | | | Hinduism | (Diploma) | \$30000 | |
| N-P27 | - | - | Buddhism | Secondary | \$10001- | 11 |
| | | | | | \$20000 | |

* Vaccination status of daughter ('+': received at least one dose of HPV vaccination; '-': had never received HPV vaccination)

** Vaccination intention ('+': plan to vaccinate daughter against HPV; '-': no plan to vaccinate daughter against HPV; 'N/A': Not applicable since their daughters had already received at least one dose of HPV vaccination)

APPENDIX 3

Sociodemographic data for Pakistani participants

| Participant NO. | Vaccination status of daughter* | Intention to vaccinate daughter ** | Religion | Highest education level | Monthly household income (HK\$) | Years of residence in Hong Kong |
|--------------------|--|--|----------|-------------------------------|--|--|
| P-P1 | - | + | Islam | Primary or below | \$5000 or below | 21 |
| P-P2 | - | - | Islam | Primary or below | \$10001- \$20000 | 8 |
| P-P3 | - | - | Islam | Secondary | Uncertain | 2 |
| P-P4 | - | + | Islam | Primary or below | Uncertain | 21 |
| P-P5 | - | + | Islam | Primary or below | Uncertain | 13 |
| P-P6 | - | - | Islam | Primary or below | \$20001- \$30000 | 15 |
| P-P7 | - | + | Islam | Secondary | Uncertain | 15 |
| P-P8 | - | + | Islam | Primary or below | Uncertain | 25 |
| P-P9 | - | + | Islam | Secondary | \$10001- \$20000 | 18 |
| P-P10 | - | - | Islam | Primary or below | \$5001- \$10000 | 7 |
| P-P11 | - | + | Islam | Secondary | \$10001- \$20000 | 4 |
| P-P12 | - | - | Islam | Primary or below | \$5001- \$10000 | 4 |
| P-P13 | - | - | Islam | Primary or below | \$10001- \$20000 | 4 |
| P-P14 | - | - | Islam | Primary or below | \$10001- \$20000 | 16 |
| P-P15 | - | - | Islam | Secondary | Uncertain | 13 |
| P-P16 | - | - | Islam | Primary or below | \$5000 or below | 4 |
| P-P17 | - | - | Islam | Primary or below | \$10001- \$20000 | 4 |
| P-P18 | - | - | Islam | Secondary | \$20001- \$30000 | 40 |
| P-P19 | - | - | Islam | Secondary | \$20001- \$30000 | 19 |
| P-P20 | - | - | Islam | Primary or below | Uncertain | 18 |
| P-P21 | + (From school) | N/A | Islam | Primary or below | \$5001- \$10000 | 18 |

| P-P22 | - | - | Islam | Tertiary | \$20001- | 11 |
|-------|---------|-----|-------|------------|----------|----|
| | | | | (Degree or | \$30000 | |
| | | | | higher) | | |
| P-P23 | + | N/A | Islam | Tertiary | \$10001- | 8 |
| | (From | | | (Degree or | \$20000 | |
| | school) | | | higher) | | |
| P-P24 | - | + | Islam | Tertiary | \$20001- | 10 |
| | | | | (Degree or | \$30000 | |
| | | | | higher) | | |

* Vaccination status of daughter ('+': received at least one dose of HPV vaccination; '-': had never received HPV vaccination)

** Vaccination intention ('+': plan to vaccinate daughter against HPV; '-': no plan to vaccinate daughter against HPV; 'N/A': Not applicable since their daughters had already received at least one dose of HPV vaccination)

APPENDIX 4

Sociodemographic data for Chinese participants

| Participant NO. | Vaccination status of daughter*/ Venue of vaccination | Intention to vaccinate daughter ** | Religion | Highest education level | Monthly household income (HK\$) | Years of residence in Hong Kong |
|--------------------|--|--|--------------|-----------------------------------|--|--|
| C-P1 | - | - | Nil | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P2 | - | + | Catholicism | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P3 | - | + | Christianity | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P4 | + (From school) | N/A | Catholicism | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P5 | - | + | Missing | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P6 | - | + | Nil | Tertiary (Degree or higher) | \$60001 or above | >40 |
| C-P7 | - | + | Nil | Secondary | \$30001- \$40000 | >40 |
| C-P8 | + (From school) | N/A | Nil | Tertiary (Diploma) | \$50001- \$60000 | >40 |
| C-P9 | + (From school) | N/A | Nil | Secondary | \$20001- \$30000 | >40 |
| C-P10 | - | + | Nil | Tertiary (Degree or higher) | Uncertain | >40 |
| C-P11 | - | + | Nil | Secondary | \$40001- \$50000 | 5 |
| C-P12 | - | + | Catholicism | Tertiary (Degree or higher) | \$60001 or above | >40 |

* Vaccination status of daughter ('+': received at least one dose of HPV vaccination; '-': had never received HPV vaccination)

** Vaccination intention ('+': plan to vaccinate daughter against HPV; '-': no plan to vaccinate daughter against HPV; 'N/A': Not applicable since their daughters had already received at least one dose of HPV vaccination)

APPENDIX 5

Interview guide (For South Asian mothers)

Hello, my name is ______. Welcome to this focus group and thank you for agreeing to participate. Today, I am going to ask you some questions about what factors affect your decision on whether to have your daughter (or daughters) vaccinated against human papilloma virus (HPV). There are no right or wrong answers to these questions. We simply want to hear your thoughts. Please feel free to express your opinions freely, correctly and honestly. Your answers and comments will be audio recorded for research purposes only. The recordings and transcripts will be kept confidential and will be destroyed upon completion of this research. Thank you again for your participation. Let us begin.

Domain One: Awareness of and attitude towards HPV and HPV vaccination

- 1. Have you heard of human papillomavirus (HPV) and cervical cancer?
- 2. What comes to your mind when you hear about HPV and cervical cancer?
- 3. Have you ever heard of HPV vaccination?
- 4. What comes to your mind when you hear about HPV vaccination?

Perceived threats of HPV infection

- 5. How vulnerable do you think your daughter will be to HPV infection or cervical cancer in her life? Why?
- 6. What do you think would be the consequences of your daughter(s) contracting HPV?

Perceived benefits of HPV vaccination

7. What do you think would be the benefits of HPV vaccination for your daughter(s)?

Domain Two: Perceived barriers to HPV vaccination

- 8. If your daughter has not received the HPV vaccine or if you have decided that she/they will not receive the HPV vaccine, what are the reasons for this?
- 9. What are your concerns about HPV vaccination? Specifically,
 - a. What do you think about the safety and side effects of the HPV vaccine?
 - b. What do you think about the claim that HPV vaccination will result in girls participating in sexual intercourse at a younger age?
 - c. What do you think about the cost of the HPV vaccine?

Domain Three: Enablers of HPV vaccination

10. If your daughter has received the HPV vaccine, what are the factors that made you decide to let your daughter(s) receive the HPV vaccine?

Domain Four: External influence

- 11. What person(s) influenced your decision to let your daughter receive the HPV vaccine? How did this (these) person(s) influence your decision?
- 12. Would you trust the advice provided by your healthcare professionals, including doctors or nurses, in Hong Kong?

- 13. How were your previous experiences in accessing healthcare services in Hong Kong?
- 14. What other aspect(s) influenced your decision to let your daughter receive the HPV vaccine? How did this (these) aspect(s) influence your decision?
- 15. How has your religious belief affected your decision to let your daughter(s) receive the HPV vaccine?

Hong Kong added the HPV vaccine to the Hong Kong Childhood Immunisation Programme in 2019. Eligible female Primary 5 and 6 students of a suitable age are provided with the HPV vaccine free of charge on a voluntary basis.

- 16. Had you heard of the Hong Kong Childhood Immunisation Programme before attending today's group interview? Can you tell me what do you know or think about programme?
- 17. Can you name the types of vaccines covered by the Hong Kong Childhood Immunisation Programme?
- 18. How has the addition of the HPV vaccine to the Hong Kong Childhood Immunisation Programme for Primary 5 and 6 students influenced your decision on whether to let your daughter receive the HPV vaccine?

Interview guide (For Chinese mothers)

訪問指引

你好,我的名字是 ________。歡迎參加本次小組訪談,感謝您同意參加。今天,我要 問您一些問題,哪些因素會影響您決定是否讓您的女兒(或多個女兒)接種人乳頭瘤 病毒 (HPV)疫苗。這些問題沒有正確或錯誤的答案。我們只是想聆聽您的想法。請隨 時自由、正確和誠實地表達您的意見。您的回答和評論將被錄音,僅供研究之用。錄 音和書面記錄將被保密,並在本研究完成後銷毀。再次感謝您的參與。那我們就開始。

第一部分:對 HPV 和 HPV 疫苗接種的認識和態度

- 1. 您聽說過人乳頭瘤病毒 (HPV) 和子宮頸癌嗎?
- 2. 您聽到 HPV 和子宮頸癌時,您會想到什麼?
- 3. 您聽說過 HPV 疫苗嗎?
- 4. 當您聽到 HPV 疫苗接種時,您會想到什麼?

對HPV 感染威脅的看法

- 5. 您認為您女兒一生中感染 HPV 或宮頸癌的風險有多大?為什麼?
- 6. 您認為您女兒感染 HPV 會產生什麼後果?

對 HPV 疫苗接種的益處的看法

7. 您認為接種 HPV 疫苗對您女兒有什麼好處?

第二部分:妨礙 接種 HPV 疫苗的因素

- 8. 如果您的女兒沒有接種 HPV 疫苗,或者您不打算讓她/她們不會接種 HPV 疫苗, 原因是什麼?
- 9. 您對接種 HPV 疫苗有什麼顧慮?具體來說:
 - -、 你對 HPV 疫苗的安全性和副作用有什麼看法?
 - 二、 你對接種 HPV 疫苗會導致女孩在更年輕的時候發生性行為的說法有什麼 看法?
 - 三、 你對接種 HPV 疫苗的費用有什麼看法?

第三部分:HPV 疫苗接種的促成因素

10. 如果您的女兒已經接種了 HPV 疫苗,有什麼因素導致您決定讓您的女兒接種 HPV 疫苗?

第四部分:外在影響

- 11. 哪些人影響了您是否讓女兒接種 HPV 疫苗的決定? 這個(這些)人是如何影響你的決定?
- 12. 您是否相信您的醫療保健專業人員(包括香港的醫生或護士)所提供的建議?
- 13. 您之前在香港獲得醫療保健服務的經歷如何?
- 14. 哪些其他因素影響了您是否讓女兒接種 HPV 疫苗的決定?這(這些)因素如何影響您的決定?
- 15. 您的宗教信仰如何影響您是否讓女兒接種 HPV 疫苗的決定?

香港於 2019 年將 HPV 疫苗加入香港兒童免疫接種計劃,讓合資格的小五和小六女學生可以自願免費接種 HPV 疫苗。

- 16. 在參加今天的小組訪談之前,您是否聽說過香港兒童免疫接種計劃?你對這計劃 有什麼認識或看法?
- 17. 您能說出香港兒童免疫接種計劃所涵蓋的疫苗種類嗎?
- 18. 將 HPV 疫苗加入香港兒童免疫接種計劃的做法 ,如何影響您是否讓您的女兒接種 HPV 疫苗 ?

感謝您參與調查。您提供的資料對我們非常珍貴。面談中提供的所有資料都將被保 密。