

RESEARCH ARTICLE

Hong Kong Chinese Women's Lay Beliefs about Cervical Cancer Causation and Prevention

Linda Dong-Ling Wang¹, Wendy Wing Tak Lam¹, Joseph Wu², Richard Fielding^{1*}

Abstract

Background: This study aimed to seek insights into Chinese women's lay beliefs about cervical cancer causal attributions and prevention. **Materials and Methods:** Twenty-three new immigrant adult women from Mainland China and thirty-five Hong Kong adult women underwent semi-structured in-depth interviews. Interviews were audio taped, transcribed and analyzed using a Grounded Theory approach. **Results:** This study generated three foci: causal beliefs about cervical cancer, perceived risk of cervical cancer, and beliefs about cervical cancer prevention. Personal risky practices, contaminated food and environment pollution were perceived as the primary causes of cervical cancer. New immigrant women more likely attributed cervical cancer to external factors. Most participants perceived cervical cancer as an important common fatal female cancer with increased risk/prevalence. Many participants, particularly new immigrant women participants, expressed helplessness about cervical cancer prevention due to lack of knowledge of prevention, it being perceived as beyond individual control. Many new immigrant participants had never undergone regular cervical screening while almost all Hong Kong participants had done so. **Conclusions:** Some Chinese women hold pessimistic beliefs about cervical cancer prevention with inadequate knowledge about risk factors. Future cervical cancer prevention programs should provide more information and include capacity building to increase Chinese women's knowledge and self-efficacy towards cervical cancer prevention.

Keywords: Cervical cancer - Chinese - immigrants - health perception - qualitative analysis - grounded theory

Asian Pac J Cancer Prev, **15** (18), 7679-7686

Introduction

Cervical cancer is the fourth most common cancer in women globally with an estimated 266, 000 deaths worldwide in 2012 (Ferlay et al., 2013). Cervical screening and HPV vaccination provide effective primary prevention significantly reducing the burden of cervical cancer.

Hong Kong ranks as a medium risk territory for cervical cancer among developed societies (Ferlay et al., 2013). In Hong Kong the Maternal & Child Health Centers (MCHCs) of the Department of Health (DH) launched an organized Cervical Screening Program (CSP) in March 2004 for women aged 25-64 with prior sexual experience (Department of Health, 2013). However, the program does not proactively recruit eligible but never-screened women. Such women have to proactively seek cervical smear services from family doctors, general practitioners or gynecologists. The charge for a cervical smear is variable among different service providers, ranging from about HK\$100 (~US\$13) to HK\$1, 000 (~US\$130), depending on whether it is a standalone test or part of a health check package, type of smear performed (conventional smear

or liquid-based cytology) and who performs the test. For MCHCs, the current fee for cervical screening service is HK\$100 for eligible HKID card holders or HK\$205 for non-eligible women. This fee only includes one cervical smear test performed by a nurse (Department of Health, 2013). By 2012 nearly one-third of eligible women in Hong Kong had never had a cervical smear (Department of Health, 2013).

Human papillomavirus (HPV) vaccination was launched in Hong Kong in 2006, but remains an individual choice, with recipients paying the full significant cost, currently around HK\$3, 000 (~US\$390) for the 3-dose injection from private providers, exclusive of administration and consultation costs. HPV vaccines are currently promoted in Hong Kong mainly through manufacturer-funded advertising, primarily targeting adolescent girls while the vaccination decisions generally devolve to mothers (Lee et al., 2007; Wang et al., 2014). By 2012 only ~7-9% of Hong Kong teenage girls had received HPV vaccination (Choi et al., 2013; Li et al., 2013), a low rate compared to many western countries where uptakes range from 17-81% (Kessels et al., 2012).

¹Centre for Psycho-Oncology Research & Training, ²Division of Epidemiology and Biostatistics, School of Public Health, The University of Hong Kong, Hong Kong, China *For correspondence: fielding@hku.hk

No data are currently available about the general female HPV vaccination uptake rate in Hong Kong.

Previous studies of Chinese women found misconceptions and knowledge deficits to be common regarding cervical cancer, HPV infection and HPV vaccination (Chan et al., 2007; Lee et al., 2007; Kwan et al., 2008; Li et al., 2012; Zhao et al., 2012; Choi et al., 2013). Most studies indicate a positive relationship between individuals' cancer-related risk perceptions and their attitudes, intentions, and actions regarding health protective and cancer preventive behaviors: if people consider cancer as controllable/preventable by their efforts they are more likely to seek medical care promptly, undergo cancer screening tests, or adopt healthy behaviors (Figueiras and Alves, 2007; Cameron, 2008; Sullivan et al., 2010). Attribution theory (Kelley and Michela, 1980) asserts causal attributions are central to determining how a person understands and interacts with the world.

Many studies have examined causal attributions held by cancer patients and survivors to link these to psychological adjustment (Stewart et al., 2001; Lam and Fielding, 2003). Other studies examined cancer attributions as a general concept held by both healthy populations (Inoue et al., 2006; Lykins et al., 2008) and individuals with cancer history (Maskarinec et al., 2001; Wold et al., 2005). However, most of previous studies were quantitative, which limited their ability to explore the spectrum of women's lay beliefs about causes and prevention of cervical cancer. The only qualitative study among Chinese non-patient adult women (Lee et al., 2007) found a diverse range of perceived causes of cervical cancer, commonly including genetic, psychological, environmental, and lifestyle factors, however, through focus group discussion and subjects were mainly recruited from a local health clinic. The nature of focus group study design and data collection methods limit deeply exploring individual's beliefs given the potential sensitive topic like cervical cancer, so findings may not apply to other women not attending health clinics with different health awareness. Additionally, Lee et al's study was conducted in 2006, and knowledge and perceptions may have changed in the interim since information about cervical cancer risk and prevention has become more widely available, therefore, a more updated understanding of how cervical cancer is perceived by Chinese women is warranted, being an important step to develop effective health communication interventions and promote cervical cancer preventive behaviors for this population.

Chinese people comprise one fourth of the world's population. Mainland China has an estimated 139,000 new cases of cervical cancer annually and more than 50,000 women die from it (China Cancer Database, 2010), yet a national-organized cervical screening program is still absent (Li et al., 2011). HPV vaccine is still in the clinical trial stage but will be available soon. Therefore, understanding Chinese women's lay beliefs about cervical cancer among this population is important to develop appropriate and effective cervical cancer prevention programs, and significantly reduce both China's and thus the world's burden of cervical cancer.

Materials and Methods

Study design and sample

Being part of a larger study aiming to understand Chinese parents' decision making on childhood and adolescent vaccinations, we conducted individual in-depth interviews with two groups of ethnic Chinese mothers in Hong Kong at two time periods: (i) between October 2011 to May 2012, new immigrant mothers who had migrated from Mainland China to Hong Kong no more than 7 years ago (the minimum eligibility period for Hong Kong permanent residency), and had at least one child aged 14 years or younger living in a Hong Kong household; and (ii) between March to September 2013, Hong Kong mothers who were Hong Kong permanent residents, and had at least one 10- to 18-year-old daughter. Grounded Theory approach was used throughout and subjects were recruited from multiple community centers across the territory by purposive sampling. In this manuscript, we aimed to elicit Chinese mothers' lay beliefs and perceptions about cervical cancer, and to compare if any difference between the two groups.

Data collection

After obtaining ethical approval from the Institutional Review Board of the University of Hong Kong/Hospital Authority, Hong Kong West Cluster, participants were informed by a trained female interviewer about the study purpose and procedures. Interview languages (Mandarin with new immigrant mothers, Cantonese or English with Hong Kong mothers) and locations were determined by respondents' preference. Upon giving written informed consent, semi-structured individual in-depth interviews were conducted.

All participants were asked about familiarity with cervical cancer, perceived causes and risk of cervical cancer, and beliefs about cervical cancer prevention. Questions and prompts were used to encourage response elaboration.

Data analysis

All interviews were digitally recorded and transcribed verbatim. Transcripts were analyzed in original language form. Firstly, by open coding data were broken down and labeled whereby each event, idea or element pertaining to a phenomenon was identified. Similar concepts were grouped and named into one category. Following this axial coding was used to explore interrelationships between categories and coded categories specified into subcategories. Finally, core categories associated with the research questions and their relationships to other categories were identified by selective coding, thereby integrating and refining findings relevant to the research focus (Strauss and Corbin, 1998). Two researchers (LDLW and WWTL) independently coded the data and held joint interpretive discussions. Disagreements were resolved by repeated textual reference, discussion, and where necessary hierarchy re-assembly and re-coding. QSR NVivo 10, a software package designed for qualitative data analysis, was used to facilitate the analytic process.

Results

Participants

Total 23 new immigrant mothers and 35 Hong Kong mothers were interviewed. Table 1 shows the characteristics of participants. Interviews lasted 30-80 minutes with new immigrant mothers, and 50-120 minutes with Hong Kong mothers. Twelve of 23 new immigrant participants had lived in Hong Kong less than 4 years. Sixteen new immigrant mothers had monthly family income below HK\$14,000 (~US\$1,800), 19 Hong Kong mothers had monthly household income HK\$20,000 (~US\$2,600) or above, approximating the median monthly domestic income of new immigrant families (HK\$14,070) and Hong Kong families (HK\$20,500), respectively in 2011 (Census and Statistics Department, 2012a, 2012b), a profile comparable to the general picture of the target population.

A summary of the major themes in the areas discussed is presented below. We use the term 'new immigrant mothers' and 'Hong Kong mothers' referring to each group of participants. 'Chinese mothers', 'Chinese women' or 'participants' in general are used to indicate both groups shared similar opinions.

Theme 1: Causal beliefs about cervical cancer

No new immigrant mothers recalled having heard of "HPV". Some new immigrant mothers had difficulties to elaborate perceived causes of cervical cancer, citing limited understanding of cervical cancer in response.

What is cervical cancer? In fact I am not very clear (about it). I only know it is a cancer. (IM6, 33y)

Comparatively, Hong Kong mothers seemed more knowledgeable about cervical cancer and all of them elaborated their causal beliefs, although again few had heard of "HPV". Among all participants who elicited their causal beliefs towards cervical cancer three groups of factors were identified, primarily including personal risky practices, environment factors, and other causes.

a. Personal risky practices

(i) (Risky) sexual behaviors Almost all Hong Kong mothers and some new immigrant mothers identified the link between sexual activities as a primary cause of cervical cancer, some interpreted as promiscuity.

I think most cervical cancers are caused by promiscuity,

if you say you have cervical cancer without reason, I don't believe it. (M12, 45y)

In fact, once (you) have sexual activity, will have (risk of) this disease, not promiscuity... Some prostitutes even won't get this disease, so I think it is not related. (M10, 37y)

A few new immigrant mothers expressed their confusion as they primarily perceived promiscuity caused cervical cancer while media commercials indicating monogamous women are also affected by cervical cancer.

Generally it (cervical cancer) is because of promiscuity, isn't it? However, I watched TV which said it is not definite. The TV (commercials) showed she (the character) affected cervical cancer although her husband is her first-lover. (I) don't know why. (IM20, 29y)

(ii) Poor personal hygiene Many new immigrant mothers and some Hong Kong mothers linked cervical cancer to poor personal hygiene.

I have no idea, it is difficult to say, sometimes if your personal hygiene is poor, or behavior improper, will cause it. Sometimes, (if you are) unlucky, (you) will have (it). The most important thing is to keep (good) personal hygiene. (IM16, 39y)

My old saying is hygiene. Yes, you should take care of your own hygiene, because if your hygiene is not good, everything can happen. (M16, 50y)

(iii) Unhealthy lifestyle No participants mentioned personal unhealthy lifestyle, such as unhealthy diet and physical inactivity, as causes/risk factors of cervical cancer, although most participants mentioned the term "unhealthy life" as the major causes of common non-communicable diseases (NCDs) in general, primarily regarding diabetes and heart diseases. Few Chinese mothers mentioned the harms of smoking while being mainly related to respiratory diseases/cancers. Only one Hong Kong mother linked smoking to cervical cancer but was not so confident about the link.

Such as those of pneumonia, throat inflammation, ah, and the tumor of the trachea, mostly caused by smoking, and, nose cancer is also because of smoking too much. (IM15, 33y)

In fact I am not sure what is risk factor of cervical cancer, what is the main cause, oh, I vaguely remember that, is it caused by smoking? (M22, 44y)

b. External factors

Besides individual risky behaviors, external causes, primarily contaminated food and environment pollution, were regarded by many Chinese mothers, particularly new immigrant mothers, as important contributors to cancer in general as well as cervical cancer.

(i) Contaminated food Food safety, especially relating to additives usage and illegal food adulteration, is a growing concern among the public. Many Chinese mothers expressed concern about contaminated food.

I think, probably because of the food. Now they use too many farm chemicals... And those farm pigs and chicken, all are vaccinated. It must have side effects (to consumers). (IM11, 34y)

Because, what we eat now, many (foods) contain hormones, which I think have effects on human body, so nowadays girls start having menstrual period at very early

Table 1. Participants' Characteristics

Characteristic	New immigrant women (N=23)	Hong Kong women (N=35)
Mean age (y)	35.7 (range 27-50)	43.6 (range 33-52)
Marital status		
Married	21	27
Separated/Divorced/Widowed	2	8
Education		
Primary	8	2
Secondary	14	26
Tertiary	1	7
Family monthly income (HK\$)		
≤10,000	12	6
10,001-19,999	7	10
20,000-50,000	4	11
>50,000	0	8

age. Moreover, off-season fruits, vegetables, many things, all those have added hormones, and been artificially cultivated. (M8, 41y)

(ii) Environment pollution Awareness of environment factors in human health, frequent media coverage of air pollution, water pollution in mainland China and the Fukushima Daiichi nuclear disaster in 2011, probably contributed to environment pollution and radiation being perceived by some participants as important causes of cancer.

It is also related to environment. Because now, you see the factories in Mainland, the polluted water, and the radiation, for instance the radiation of nuclear power from Japan after the earthquake, all these have effect on people's health. (IM17, 38y)

One aspect is related to food, and air pollution, in fact, which not only causing this disease (cervical cancer), but this disease is specific to women. (M8, 41y)

c. Other causes

The other perceived causes of cervical cancer were diverse including heredity, stress, bad luck, and gynecological diseases.

Sexuality, if (it is) unhygienic will cause uterus inflammation, and if it is ignored for few years, it will develop to cancer. (M10, 37y)

A few new immigrant mothers mentioned childbirth, some proposing opposing risks.

The risk (of cervical cancer) seems to be higher among (women) who never give birth. (IM9, 34y)

I don't know. But I know, I heard that (women) after giving birth, the risk (of cervical cancer) is certainly higher. (IM10, 41y)

Theme 2: Perceived risk of cervical cancer

Most participants acknowledged there was a rapid growing challenge from cancers and understood cervical cancer as a common female cancer. A typical case frequently motioned was the death of Anita Mui, a Pop diva and actress of Hong Kong, who died of cervical cancer in 2003 at the age of 40.

Because now, except breast cancer, cervical cancer is one of the commonest cancers among females, the most impressive case is Anita Mui died of cervical cancer several years ago. (M1, 37y)

Participants' perceived risk of cervical cancer varied, often reflected with paralleling emotional representations.

a. Perceived severity of cervical cancer

Most participants considered cervical cancer as fatal for females. Many new immigrant mothers and some Hong Kong mothers expressed their feelings of fear/worry about cervical cancer.

This kind of disease is really terrible. Now a lot of people died of cervical cancer, a lot, such as Anita Mui, they all died of cervical cancer, at so young an age. (IM19, 38y)

Before you know it, that is, at the first two stages if you didn't find it, the 3rd, 4th, 5th stage, very soon, may die. Chemotherapy, or medication, (will) make person (the patient) rather die than live. I feel it is very cruel, very

terrifying. (M20, 41y)

Conversely, few Chinese mothers (primarily constituted by Hong Kong mothers) expressed less/no anxiety about cervical cancer as they believed cervical cancer was curable after early detection.

I felt that, keep to checkup, because I did it (regularly). If you keep doing checkup, if you can detect it at early stage, in fact I think it is curable. (M18, 39y)

b. Perceived risk of cervical cancer increasing

The perceived prevalence of cervical cancer varied, often depending on how frequently participants had been exposed to the topic through media or social networks. Many Chinese women felt the risk of cervical cancer was increasing as they were more frequently exposed to the news of cancer cases.

Because now cancer is...the risk is really high, compared to the past, there are too many cancers. Many friends around me suffered. (IM8, 44y)

In the past I didn't understand cervical cancer so clearly, but now more and more often (I) heard someone affected cervical cancer, it is really scary. (M24, 48y)

In particular, many Chinese mothers believed the younger generations were more susceptible to cervical cancer because they were more likely to have early and casual sex, in addition to living in a polluted environment.

Nowadays young people's lifestyle is, and making friends, not as conservative as we were. They are more "western". (M3, 42y)

Theme 3: Beliefs about cervical cancer prevention

Many new immigrant mothers and few Hong Kong mothers reported difficulties in cervical cancer prevention, based on their understanding of the causes and value of preventive methods.

a. Pessimism towards cervical cancer prevention

(i) Lack of knowledge about prevention Many new immigrant mothers expressed helplessness about cervical cancer prevention due to lack of cancer prevention knowledge.

I don't know how to prevent. I only know that for lung cancer, less smoking can prevent it. Hum, I know drinking (alcohol) is not good for stomach. And diet, just eat less fried food, there is no good prevention, I don't know how to prevent. (IM11, 34y)

It is related with private life, just as they said, (if) private life is improper, will have the possibility. And personal hygiene should be cared. Others, I don't know. (M8, 41y)

(ii) Skepticism to prevention value Some Chinese mothers doubted or perceived limited value of cervical cancer prevention.

I take the Pap smear regularly, every three years. But I am not sure about the reliability, because somebody (I know) got the first stage (of cervical cancer) just half year after the test. (M5, 40y)

Better to do it (Pap smear) every year, but (I) am not sure whether, just like, if I tested at the beginning of the year, but eventually affect it (cervical cancer) at end of the year. This is very difficult to prevent. (M20, 41y)

One new immigrant mother expressed pessimistic beliefs justified through comparison to socioeconomically advantaged prominent people whom, she assumed, must have adopted health preventive behaviors, and yet were still affected by cervical cancer.

You see those famous stars, how rich they are. They must have regular body checkup every year, but she (Anita Mui) still suffered (cervical cancer). It is difficult to prevent, I think. (IM20, 29y)

(iii) Perceived prevention not within individual control Chinese mothers who primarily attributed cervical cancer to external factors more often expressed helplessness and perceived difficulties in cancer prevention since these health-damaging external factors were perceived as beyond an individual's ability to control and therefore inevitable.

Hey, no way to avoid it. You have to buy and eat it as you live here, otherwise have to die. Ah, no way of prevention. (IM15, 33y)

Cancer is more difficult to control (compared to diabetes and heart diseases). Because, sometimes a healthy person can suddenly have cancer without reasons, don't know the reasons. So, I think it is very difficult to prevent. The other diseases, you can start (prevention) from your own (behaviors). (M14, 43y)

b. Perceived value of prevention with HPV vaccination

(i) "Like buying insurance" HPV vaccines primarily target adolescent girls for adult-onset cervical cancer prevention. Some Chinese mothers used the metaphor of buying insurance to describe the value of HPV vaccination.

If it provides the protection (against cervical cancer), it might as well as say buying insurance. Because no one can predict whether she will have this problem (cervical cancer), can they? (IM5, 38y)

I think, at least it (HPV vaccination) is not harmful to her health, just like buying insurance, buy peace of mind. You won't know whether it is really going to work, because vaccinations are not 100% effective. (But) I think it is worthy to do it if affordable. (M2, 51y)

(ii) Anticipated anxiety reduction Anticipated/perceived anxiety reduction resulting after vaccination was a common emotional benefit expressed by many new immigrant mothers and few Hong Kong Mothers. .

I think if it is OK, better to vaccinate, you can set your mind at rest. Because if there is someone around you suffering from the disease (cervical cancer), you will worry about it...The vaccination will make you feel a little relieved. (IM17, 38y)

(iii) HPV vaccination is unnecessary Some Hong Kong mothers and few new immigrant mothers considered HPV vaccination to be unnecessary or dispensable, believing instead that adopting a 'proper' lifestyle characterized by monogamy and condom use could help reduce the risk of cervical cancer.

I think it is dispensable. If you are rich, you have the ability, and then you can take vaccination, just like buying insurance. If you don't have the ability, (but) you behave properly, it doesn't matter without vaccination. (M12, 45y)

This is related to sexuality, so it can be prevented by condoms, isn't it? (M31, 52y)

c. Barriers to attending cervical screening

Almost all Hong Kong mothers had ever undertaken cervical screening, while few new immigrant mothers had done so, often citing unawareness of access, difficulty of making appointment, embarrassment, and no free screening service, as reasons for absence.

(i) Organizational access barriers As new arrivals to Hong Kong, some new immigrant mothers never went for cervical screening because they did not know how to access the service.

Where to go for test? How to do it? I have no idea, so I didn't go. (IM8, 44y)

Some new immigrant mothers said that they never utilized cervical smear services because in Hong Kong individuals need to make an appointment in advance. These women often felt it was difficult to make/keep the appointment. This was compounded by a different system of health care organization and utilization to that in Mainland China.

You have to make appointment, wait for very long time, sometimes maybe one month, or 2 to 3 months, so I didn't go. (IM22, 31y)

Here you have to make appointment, not you can go whenever you want. If you cannot go at the appointed time, they will cancel your appointment, very troublesome. ... not like in Mainland, I can go at any time I want, no need to wait. (IM21, 27y)

(ii) Emotional barriers Some new immigrant mothers reported embarrassment as major reason for avoiding cervical smear screening. In particular, when booking a smear at the more affordable public healthcare providers they had no control over the practitioner's gender.

No, you cannot select doctor... We gave birth here, also (attended) by male doctors, all by male doctors. I felt very embarrassed. So I don't want to go (for cervical smear). (IM15, 33y)

(iii) Cost barriers A few new immigrant mothers explained that because the government did not provide free checkup/screening services, and that they could not justify paying a lot of money for potential preventive services, so they did not go for screening.

Because this (screening) is not a free checkup, we didn't pay much attention. You have to pay out-of-pocket to have a body check, or take vaccination, (so I) feel like, ah, it's not so necessary...All expenses are on us, about several hundred or even thousands of dollars, so I didn't go. (IM6, 33y)

(iv) Attitudinal barriers Some new immigrant mothers expressed fatalistic beliefs about cancer prevention, as their main reasons for not seeking cervical screening.

Maybe because I am optimistic. How much you can eat or wear, all are doomed under Heaven. I am optimistic, so I didn't go for it (cervical smear screening). (IM15, 33y)

Discussion

In this sample of Hong Kong and new immigrant Chinese mothers, general knowledge of cervical cancer was low across both groups, but particularly so among new immigrant women. Some immigrant women evidenced

difficulties in differentiating cervical cancer from other cancers. New immigrant women more often attributed causes of cancer to external factors, and held more fatalistic beliefs about cancer prevention.

In marked contrast to their Hong Kong counterparts, many new immigrant women had not sought regular cervical smear screening. However, most new immigrant participants were of low-to-middle-class socioeconomic status (SES), being comparable to the general profile of new immigrants in Hong Kong who tended to take up lower skilled and valued jobs, having a median monthly household income that is only 68.6% of that for Hong Kong households generally (Census and Statistics Department, 2012b). The most commonly cited reasons for failure to utilize cervical screening were ignorance regarding service access, inconvenience, cost, and embarrassment. Financial cost was a major barrier for screening, with the lack of choice of female practitioners in the affordable government sector discouraging women from utilization, and the high financial cost in the private sector serving to block utilization there. Cost is also a barrier to HPV vaccination uptake (Choi et al., 2013; Wang et al., 2014). A recently published survey revealed potential social disparities in HPV vaccination with Hong Kong adolescent girls who are socio-economically advantaged (locally born, mothers educated to tertiary level or above) being more likely to be vaccinated (Li et al., 2013). Therefore, making cervical screening and HPV vaccination accessible and affordable would significantly reduce disparities in cervical cancer risk and women's health among new immigrants and potential other low SES groups in Hong Kong.

Chinese women expressed lay beliefs about cervical cancer were often a mixture of medical and folk knowledge (Del Castillo et al., 2011), and if disproportionately influential in cancer causal attributions they might significantly influence health outcomes (Branstrom et al., 2006). While almost all Hong Kong women and some new immigrant women correctly attributed cervical cancer to sexual activity, some took comfort in optimistic bias, linking cervical cancer to promiscuity, despite the high population prevalence of HPV infection, with the result that those women perceived themselves and their daughters to be non-promiscuous, and thus at low risk, making vaccination unnecessary. Some women who interpreted cervical cancer as caused by sexuality (rather than promiscuity) consequently regarded the risk factor as unavoidable in life. Such women often perceived greater value in HPV vaccination for cervical cancer prevention.

On the other hand, while public health education emphasizes the link between personal lifestyle factors and cancer risk, such educational material often lacks more detailed information about the causes or risk factors for specific cancers, which can result in unintended negative social effects such as triggering public stigma towards cancer patients. Patients with certain types of cancer are more likely blamed when their illness is perceived to be caused by personal behaviors or (particularly disapproved) lifestyles (Chapple et al., 2004; Lebel and Devins, 2008; Shepherd and Gerend, 2013). Knowledge of the link between sexuality behavior and cervical cancer could

increase the chances that women with cervical cancer may be stigmatized for their medical condition (Lebel and Devins, 2008; Shepherd and Gerend, 2013). Some Chinese women over-ascribed the cause of cervical cancer to promiscuity, which again is stigmatizing cervical cancer patients. People subject to stigmatization report more chronic stress, which can impair health outcomes directly, and indirectly by reducing adherence to necessary follow-up procedures due to fear of further stigmatization (Else-Quest et al., 2009; Lai et al., 2009). One solution is for cervical cancer prevention programs to emphasize the very high HPV infection prevalence in the general population and promote health protective behaviors such as condom use. Such programs should also challenge the "promiscuity" myth to help reduce cancer-related stigma towards cervical cancer (Keusch et al., 2006).

Smoking (including passive smoking) has been identified as important contributor to cervical cancer (Slattery et al., 1989; Natphosuk et al., 2012; Zeng et al., 2012). However, our study found few participants mentioned the harms of smoking, relating it to respiratory diseases/cancers. Only one Hong Kong mother linked smoking to cervical cancer, suggesting Chinese women have limited knowledge about the wider impacts of smoking. Studies also found that lay public generally have a limited understanding of the nature and severity of illnesses caused by cigarette smoking (Weinstein et al., 2004). Female smokers in the UK are largely unaware of their increased risk of cervical cancer and the increased value of regular Pap smears (Marteau et al., 2002). Future cancer prevention education and smoking control should include emphasis on the wider impacts of smoking on women's health.

Study limitations may result from data collection occurring during two time-periods which it might be argued, allow for events to influence one group but not the other. However, to the best of our knowledge, there were not high profile events related to cervical cancer or HPV vaccines in the media immediately before or during either data collection time. Our findings are consistent with earlier studies in Hong Kong. The study sample also has characteristics comparable to those of new immigrant women and Hong Kong women in general. Thus, there is good reason to believe that this study presents a valid and reliable picture of the beliefs and perceptions held by many Chinese women in Hong Kong. Future research can use quantitative methods to further verify the study findings.

In conclusion, we used qualitative method to explore lay beliefs about causes and prevention of cervical cancer among Chinese women from two groups: new immigrant mothers and Hong Kong mothers. Both groups of women held notably different views about the causes of cervical cancer, while sharing similar beliefs about prevention. Our study results provide insights for healthcare providers and policy-makers responsible for communicating cervical cancer prevention information.

Acknowledgements

We thank all the mothers who participated in the interviews. Thanks also to Hong Kong New Immigrant

Service Association, International Social Service Hong Kong Branch, and United Christian Nethersole Community Health Service (UCN) for help recruiting new immigrant participants. We would also like to thank Hong Kong Government's Health and Medical Research Fund (HMRF, #12110892) for financial support of the study of Hong Kong mothers, and Ms. Cynthia Law for her assistance in data collection and transcription in the study of Hong Kong mothers.

References

- Branstrom R, Kristjansson S, Ullen H (2006). Risk perception, optimistic bias, and readiness to change sun related behaviour. *Eur J Public Health*, **16**, 492-7.
- Cameron LD (2008). Illness risk representations and motivations to engage in protective behavior: The case of skin cancer risk. *Psychol Health*, **23**, 91-112.
- Census and Statistics Department (2012a). 2011 Population Census Summary Results. (Hong Kong). Retrieved from <http://www.census2011.gov.hk/pdf/summary-results.pdf#page=57>.
- Census and Statistics Department (2012b). 2011 Population Census Thematic Report: Persons from the Mainland having resided in Hong Kong for less than 7 Years. (Hong Kong). Retrieved from <http://www.census2011.gov.hk/pdf/PMR.pdf>.
- Chan SSC, Cheung TH, Lo WK, Chung TKH (2007). Women's attitudes on human papillomavirus vaccination to their daughters. *J Adolesc Health*, **41**, 204-7.
- Chapple A, Ziebland S, McPherson A (2004). Stigma, shame, and blame experienced by patients with lung cancer: qualitative study. *Brit Med J*, **328**, 1470-3.
- China Cancer Database (2010). Cervical neoplasm surveillance. Available <http://cancernet.cicams.ac.cn/index.php?option=content&task=view&id=30&Itemid=48> [Accessed December 2010].
- Choi HCW, Leung GM, Woo PPS, Jit M, Wu JT (2013). Acceptability and uptake of female adolescent HPV vaccination in Hong Kong: a survey of mothers and adolescents. *Vaccine*, **32**, 78-84.
- Del Castillo A, Godoy-Izquierdo D, Vazquez ML, Godoy JF (2011). Illness beliefs about cancer among healthy adults who have and have not lived with cancer patients. *Int J Behav Med*, **18**, 342-51.
- Department of Health (2013). Cervical Screening Programme. Available <http://www.cervicalscreening.gov.hk/eindex.php> [Accessed March 2013].
- Else-Quest NM, LoConte NK, Schiller JH, Hyde JS (2009). Perceived stigma, self-blame, and adjustment among lung, breast and prostate cancer patients. *Psychol Health*, **24**, 949-64.
- Ferlay J, Soerjomataram I, Ervik M, et al (2013). GLOBOCAN 2012 v1.0, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11. Available <http://globocan.iarc.fr/> [Accessed March 2014].
- Figueiras MJ, Alves NC (2007). Lay perceptions of serious illnesses: An adapted version of the Revised Illness Perception Questionnaire (IPQ-R) for healthy people. *Psychol Health*, **22**, 143-58.
- Inoue M, Iwasaki M, Otani T, Sasazuki S, Tsugane S (2006). Public awareness of risk factors for cancer among the Japanese general population: a population-based survey. *BMC Public Health*, **6**, 1471-2458
- Kelley HH, Michela JL (1980). Attribution theory and research. *Annu Rev Psychol*, **31**, 457-501.
- Kessels SJM, Marshall HS, Watson M, et al (2012). Factors associated with HPV vaccine uptake in teenage girls: a systematic review. *Vaccine*, **30**, 3546-56.
- Keusch GT, Wilentz J, Kleinman A (2006). Stigma and global health: developing a research agenda. *Lancet*, **367**, 525-7.
- Kwan TTC, Chan KKL, Yip AMW, et al (2008). Barriers and facilitators to human papillomavirus vaccination among Chinese adolescent girls in Hong Kong: a qualitative-quantitative study. *Sex Transm Infect*, **84**, 227-32.
- Lai B, Tang C, Chung T (2009). Age-specific correlates of quality of life in Chinese women with cervical cancer. *Support Care Cancer*, **17**, 271-8.
- Lam WWT, Fielding R (2003). The evolving experience of illness for Chinese women with breast cancer: a qualitative study. *Psycho-Oncol*, **12**, 127-40.
- Lebel S, Devins GM (2008). Stigma in cancer patients whose behavior may have contributed to their disease. *Future Oncol*, **4**, 717-33.
- Lee PW, Kwan TT, Tam KF, et al (2007). Beliefs about cervical cancer and human papillomavirus (HPV) and acceptability of HPV vaccination among Chinese women in Hong Kong. *Prev Med*, **45**, 130-4.
- Li J, Kang LN, Qiao YL (2011). Review of the cervical cancer disease burden in mainland China. *Asian Pac J Cancer Prev*, **12**, 1149-53.
- Li SL, Lau YL, Lam TH, et al (2013). HPV vaccination in Hong Kong: uptake and reasons for non-vaccination amongst Chinese adolescent girls. *Vaccine*, **31**, 5785-8.
- Li ZF, Wang SM, Shi JF, et al (2012). Combined screening of cervical cancer, breast cancer and reproductive tract infections in rural China. *Asian Pac J Cancer Prev*, **13**, 3529-33.
- Lykins EL, Graue LO, Brechting EH, et al (2008). Beliefs about cancer causation and prevention as a function of personal and family history of cancer: a national, population-based study. *Psychooncology*, **17**, 967-74.
- Marteau TM, Hankins M, Collins B (2002). Perceptions of risk of cervical cancer and attitudes towards cervical screening: a comparison of smokers and non-smokers. *Fam Pract*, **19**, 18-22.
- Maskarinec G, Gotay CC, Tatsumura Y, Shumay DM, Kakai H (2001). Perceived cancer causes - use of complementary and alternative therapy. *Cancer Pract*, **9**, 183-90.
- Natphopsuk S, Settheetham-Ishida W, Sinawat S, et al (2012). Risk factors for cervical cancer in northeastern Thailand: detailed analyses of sexual and smoking behavior. *Asian Pac J Cancer Prev*, **13**, 5489-95.
- Shepherd MA, Gerend MA (2013). The blame game: cervical cancer, knowledge of its link to human papillomavirus and stigma. *Psychol Health*, **29**, 94-109.
- Slattery ML, Robison LM, Schuman KL, et al (1989). Cigarette smoking and exposure to passive smoke are risk factors for cervical cancer. *JAMA*, **261**, 1593-8.
- Stewart DE, Duff S, Wong F, Melancon C, Cheung AM (2001). The views of ovarian cancer survivors on its cause, prevention, and recurrence. *Medscape Womens Health*, **6**, PMID: 11698927.
- Strauss AL, Corbin JM (1998). Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory, 2nd edn. SAGE, California.
- Sullivan HW, Rutten LJF, Hesse BW, et al (2010). Lay representations of cancer prevention and early detection: associations with prevention behaviors. *Prev Chronic Dis*, **7**, A14.
- Wang LDL, Lam WWT, Wu J, Liao Q, Fielding R (2014). Chinese immigrant parents' vaccination decision making for children: a qualitative analysis. *BMC Public Health*, **14**, 133.

- Weinstein ND, Slovic P, Waters E, Gibson G (2004). Public understanding of the illnesses caused by cigarette smoking. *Nicotine Tob Res*, **6**, 349-55.
- Wold KS, Byers T, Crane LA, Ahnen D (2005). What do cancer survivors believe causes cancer? (United States). *Cancer Cause Control*, **16**, 115-23.
- Zeng XT, Xiong PA, Wang F, et al (2012). Passive smoking and cervical cancer risk: a meta-analysis based on 3, 230 cases and 2, 982 controls. *Asian Pac J Cancer Prev*, **13**, 2687-93.
- Zhao FH, Tiggelaar SM, Hu SY, et al (2012). A multi-center survey of HPV knowledge and attitudes toward HPV vaccination among women, government officials, and medical personnel in China. *Asian Pac J Cancer Prev*, **13**, 2369-78.