Knowledge and Perceptions of HPV and the HPV Vaccine among Pre-adolescent Girls and Their Guardians in Georgetown, Guyana

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ABSTRACT

Objectives: *To examine the knowledge and perceptions of 11-year old girls and their guardians toward the human papillomavirus (HPV), HPV (mandatory) vaccination and cervical cancer and to determine their main sources of health information.*

Methods: *A cross-sectional study was done by interviewing two separate study populations* ie *11-year old girls from five primary schools in Georgetown and their guardians. Questions were designed to assess level of knowledge as well as perceptions about mandatory vaccination and sources of health information.*

Results: *A total of 87 girls participated, of whom 10 (11%) had already received the HPV vaccine. Overall, when asked whether they knew of HPV, the HPV vaccine, cervical cancer or the Pap smear, more than half of the girls, in every instance, did not know. Seventy-four guardians took part and most (> 80%) of them claimed that they knew about these parameters except for HPV transmission (40%) and the cause of cervical cancer (30%). Both girls and guardians responded poorly to questions about the detection of cervical cancer. Furthermore, only two of the 14 girls who stated that they knew how HPV was transmitted, actually answered correctly that it was sexual transmission. Girls were almost twice as likely to be in favour of mandatory vaccination as guardians (OR 1.8, 95% CI: 0.9, 3.6) but the difference was not significant (*$p > 0.05$*). The girls indicated health centres/clinics (58%), whilst TV/radio (66%) was the preference for the guardians as their most popular health information sources.*

Conclusions: *These findings point to a necessity for educational programmes and activities in which children and their guardians can meaningfully participate and be informed about the different aspects of HPV vaccination.*

Keywords: Girls, guardians, Guyana, human papillomavirus (HPV), knowledge, vaccine

Conocimientos y Percepciones de VPH y la Vacuna contra el VPH entre las Niñas Preadolescentes y Sus Tutoras o Tutores en Georgetown, Guyana

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RESUMEN

Objetivos: *Examinar los conocimientos y las percepciones de las niñas de 11 años de edad y sus tutoras o tutores hacia el virus del papiloma humano (VPH), la vacunación (obligatoria) contra el VPH y el cáncer del cuello uterino, y determinar sus principales fuentes de información de salud.*

Métodos: *Se realizó un estudio transversal entrevistando a dos poblaciones de estudio por separado, es decir, niñas de 11 años de cinco escuelas primarias en Georgetown por una parte, y sus tutoras o tutores por otra parte. Las preguntas fueron diseñadas con el fin de evaluar el nivel de conocimiento, así como las percepciones sobre la vacunación obligatoria y las fuentes de información de salud.*

Resultados: *Participaron un total de 87 niñas, 10 (11%) de las cuales ya habían recibido la vacuna contra el VPH. En general, cuando se les preguntó si sabían del VPH, la vacuna contra el VPH, el cáncer cervical o la prueba de Papanicolaou, más de la mitad de las niñas en su totalidad, no sabían. Setenta y cuatro tutoras/tutores tomaron parte y la mayoría (> 80%) de ellos afirmaron que sabían de estos parámetros, con excepción de la transmisión del VPH (40%) y la causa del cáncer cervical (30%). Tanto las niñas como las tutoras o tutores dieron respuestas pobres a las preguntas sobre la detección del cán-*

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*cer de cuello uterino. Además, sólo dos de las 14 niñas que dijeron saber cómo se transmite el VPH, respondieron realmente de manera, apuntando a la transmisión sexual. La probabilidad de estar a favor de la vacunación obligatoria fue dos veces mayor entre las niñas que entre las tutoras o tutores (OR 1.8, 95% IC: 0.9, 3.6), pero la diferencia no fue significativa (*p > *0.05). Las niñas indicaron su preferencia por los centros o clínicas de salud (58%) como sus fuentes más populares de información sobre la salud, mientras que las tutoras o tutores señalaron su preferencia por la televisión y la radio (66%).*
Conclusiones: *Estos resultados apuntan a una necesidad de programas educativos y actividades en tanto las niñas como sus tutores puedan tener una participación significativa, y estar informados sobre los diferentes aspectos de la vacunación contra el VPH.*

Palabras claves: Niñas, tutores, Guyana, vacuna, virus del papiloma humano (VPH), conocimiento

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INTRODUCTION

Human papillomavirus (HPV) infection has been identified as an asymptomatic, sexually transmitted infection (STI) which may eventually develop into genital warts and in some cases cervical cancer (1, 2). Globally, cervical cancer is considered as one of the most common cancers among women, and statistics for Guyana, in 2010, indicated that approximately 160 women are diagnosed with cervical cancer and about 75 die annually (3). The rate of HPV infection has not been determined specifically for Guyana but studies in neighbouring Brazil indicate that the prevalence of HPV infected women ranges from 14–54% (4), and in Trinidad and Tobago, the prevalence in women was about 41% in 2011 (5).

A study conducted in the United States of America (USA) showed that vaccination at age 12 years would reduce the development of cervical cancer by 62% as compared with 51% if the vaccine was given at age 18 years (6). Debate about how early is the best time to vaccinate against HPV and whether it should be made mandatory has been ongoing, with mothers weighing the benefits of prevention with risk of encouraging early sexual behaviour or unhealthy lifestyles (7).

Another concern of healthcare professionals (HCPs) and advocacy groups is that the use of the vaccine could negatively affect a person's willingness to seek early detection and treatment which is equally important in the fight to combat cervical cancer (8). Even with the introduction of the HPV vaccine, the need for continuing cervical examinations (Pap smears) and screening (visual inspection with acetic acid – VIA) cannot be over-emphasized but may be overlooked if there is insufficient knowledge about the HPV vaccine and cervical cancer (9).

Research on knowledge and attitudes also points to a lack of awareness about the cause, transmission and prevention of HPV and cervical cancer in both guardians and girls (8). A study on the independent predictors of parents' acceptability of the HPV vaccine found that parents were more positively influenced by attitudes and beliefs and not necessarily knowledge (10). However, it can be argued that one aspect of modifying incorrect beliefs and attitudes is by ensuring that as many persons get access to the correct health information in a useful and meaningful way and this will positively influence the decision-making process as it pertains to HPV vaccination.

The Ministry of Health in Guyana has undertaken to introduce the HPV vaccine for 11-year old girls. Thus, a study that focusses on the knowledge and perceptions of the target population would be both timely and provide helpful, scientific data about the likely success of any HPV vaccination intervention. This study seeks to evaluate the knowledge of HPV, the HPV vaccine, and cervical cancer among 11-year old girls and their guardians; to examine their opinions about making the vaccine mandatory and their willingness to be vaccinated and also to compare their sources of health information for any significant differences.

SUBJECTS AND METHODS

A cross-sectional survey, on two different study populations, was carried out in May to June 2012, and was used to examine the level of knowledge in a sample of 11-year old girls and their guardians. To select the girls, five primary schools in Georgetown were chosen from among the 30 government/public schools listed by the Ministry of Education (MoE) for the Georgetown region. The schools were selected using systematic random sampling. The starting point was chosen using a table of random numbers and every other sixth school was then selected. Similarly, using the class register, every other two girls from each class were randomly chosen, totalling about 15–20 girls per school. One class per school was chosen if a school had more than one class of 11-year old girls. The head teacher together with the class teacher determined which class would be chosen based on availability on the timetable.

The target sample size was 100 girls, considering that there are about 900 11-year old girls in the public school system in Georgetown based on verbal communication with an MoE official. The sample size was determined using an appropriate statistical formula for minimum sample and was estimated at 96 for a 95% level of confidence and using the formula $N = Z^2 P (1-P)/d^2$ where P or anticipated population proportion was set at 50% or 0; d or desired precision was set at 10% and for 95% level of confidence and z = 1.960 (11).

The researchers intended to interview at least one guardian for each student which would give 100 guardians. A

guardian was considered as a parent or caregiver responsible for the girl.

Questionnaires were used to collect the data where participants filled in the information on the paper and the completed questionnaire was submitted to the researcher. One questionnaire was used for the girls first and included questions about HPV, the vaccine, cervical cancer and access to health information. A similar questionnaire was utilized for the guardians but also incorporated questions about level of education, gender and home address. Questionnaires were pretested, to eliminate any ambiguous questions with volunteers (nine girls and their parents in total) from the researchers' respective churches, once it had been established that the children selected did not attend school in Georgetown. No major changes were made after the pre-testing phase was completed. Each questionnaire took approximately 15 minutes to complete. The research questions were used to guide the *de novo* design of the questionnaire. Most of the questions on the questionnaire were closed-ended but if participants indicated that they knew the cause of cervical cancer and how it was detected, they were asked to give a response. They were also asked to give a reason why they think the vaccine should or should not be made mandatory and why they would or would not want (their child) to be vaccinated.

Arrangements were made with the heads of schools to meet with guardians and children on the same day. Letters were sent to the guardians asking them to be present on a particular day and to inform them that there would be an activity involving their child. The head teacher was also asked to provide a list of teachers in the school who had 11-year old daughters.

If parents did not attend, then teachers in the school who had 11-year old daughters were asked to participate. Once the activity was completed, each respondent received an information pamphlet. Informed consent, right to privacy, confidentiality and voluntary participation were all considered; no names were taken, the information was kept strictly confidential and participation was voluntary. This was made clear to the participants both verbally as well as on the consent form. Before the questionnaire was filled in, the researchers obtained written, informed consent from both the parent/guardian as well as the child (in the presence of her parent/guardian). However, the child was given the questionnaire away from her parent/guardian. The questions were non-intrusive and participants were not asked about their sexual behaviour or personal life. The research proposal, including the consent form, questionnaire and pamphlet, was approved by the Ministry of Health Institutional Review Board (IRB) and the Ministry of Education.

Data were analysed using the Statistical Package for Social Sciences (SPSS) version 15.0. Descriptive statistics was used to indicate the demographic characteristics as well as the level of knowledge and the views of the two groups. Chi-squared testing was used to assess differences with respect to health information sources and also perceptions about vaccination. A p-value of < 0.05 was considered statistically significant.

RESULTS

Of the 100 children who were invited, 87 participated. In addition, of the 100 parents, 60 participated. Twenty teachers were also invited and 14 took part. The study, therefore, comprised 87 students and 74 parents/guardians. All of the 161 respondents were female. The mean age of the children was 11 years and of the 74 guardians, most were in the 30-40 years (51%) and 40-50 years age groups (39%). The girls were all in grade six. For the guardians, most had completed tertiary education (62/74 or 83.7%), 12.2% (9/74) had secondary level education and 4.1% (3/74) had only primary education.

Table 1: Knowledge and perceptions of the respondents about human papillomavirus (HPV) and the vaccine

Variables	Girls (n = 87) n (%)	Guardians (n = 74) n (%)
Knowledge variables		
Heard about HPV	26 (30)	60 (81)
Claimed to know how HPV is transmitted	14 (16)	29 (39)
Heard about HPV vaccine	40 (46)	61 (82)
Claimed to know cause of cervical cancer	9 (10)	22 (30)
Claimed to know how cervical cancer is detected[a]	3 (3)	
Heard about Pap smear	3 (3)	68 (92)
Perception variables		
HPV vaccine should be made mandatory	35 (40)	20 (27)
Would want to be vaccinated (girls only)	24 (31)[a]	
Would want child to be vaccinated (guardians only)		26 (35)

[a]This represents 24 of 77 unvaccinated girls; 10 were already vaccinated

According to Table 1, 30% of the girls and 81% of the guardians had heard of HPV. A similar pattern was seen when participants were asked about whether they had heard about the HPV vaccine and cervical cancer (Table 1). The majority of respondents did not know how HPV was transmitted (Table 1) and although 14 (16%) girls claimed they knew how it was transmitted, only two of them actually gave the correct response. Two girls said that *"HPV is transmitted through kissing someone who has cuts in their mouth"*. Twenty-one of the 29 guardians, who claimed they knew about HPV transmission, correctly indicated sexual transmission; however, one guardian indicated that *"HPV is transmitted by the Internet"*. Furthermore, only 10% of girls and 30% of guardians indicated that they knew the cause of cervical cancer. Girls were specifically asked about the detection of cervical cancer and although three (3.4%) of them said that they knew, only two gave the correct response. Guardians were asked if they had heard of a Pap smear and if so, to indicate its use. Of the 68 (92%) guardians who had heard of it, most (45/68 or 66%) gave the correct response for its use. But there were still misconceptions, with one guardian indicating that a *"Pap smear is used to clean out the vagina"*. Ten of the 87 girls (11%) had actually received the HPV vaccine but only two of them knew

about HPV and its transmission. Those two girls gave the correct responses when asked how HPV is transmitted, and what causes cervical cancer and they mentioned specifically that cervical cancer could be detected *via* a Pap smear or VIA screening. Among unvaccinated girls, only 31% (24/77) indicated positively when questioned about whether they would like to be vaccinated. The guardians were asked if they would want their child/children to be vaccinated and a similar percentage (35%) said yes (Table 1). Some of their reasons included that *it would protect against cervical cancer* but some also said that they thought *it would be good for their daughter's health*. Some of the responses of those who were against it included *"the side effects are not known", "it will give her a license to have sex early"* and *"the vaccine causes blindness"*.

Forty per cent of girls and 27% of guardians thought that the vaccine should be made mandatory. Girls were almost twice as likely to feel that way as guardians (OR 1.8; 95% CI 0.9, 3.6) but the difference was not statistically significant ($p = 0.1$). Most of the girls indicated that it should be made mandatory because it will improve health but only five specified that it would prevent transmission of HPV. Two girls erroneously thought that *mandatory vaccination would protect young people against AIDS*. Most girls and guardians who were against mandatory vaccination indicated that information was limited and that it should be a personal choice.

When comparing health information sources between the girls and the guardians, the differences were statistically significant for all the parameters ($p < 0.05$) except for friends/neighbours (Table 2). Guardians were more likely to use healthcare professionals, TV/radio, books/magazines and the Internet as their sources of health information (Table 2). Girls were three times more likely to seek out family and health centres/clinics than guardians. It should be noted that participants were allowed to give multiple answers when responding to this question.

Trinidad in 2012 also found that although many women (80%) know about cervical cancer, only 25% know of HPV and even fewer know that HPV transmission could be prevented (14). The current study showed that there is an important gap between what persons think they know and what is the correct information; for example, although a number of persons claimed to know how HPV is transmitted and the cause of cervical cancer, few actually knew that the correct responses were sexual transmission and HPV, respectively. This is cause for concern and should be addressed immediately.

The girls in our study were not of age to have Pap smears so this may have contributed to their poor knowledge on detection of cervical cancer. The American Cancer Society (ACS) recommends that women who have been sexually active or who have reached age 18 years should have Pap smears done once a year (15), and they are still necessary even for those persons who have had the HPV vaccine (8). A study conducted in Region 9 in Guyana, on mainly indigenous Amerindian women, found that 16% of the participants had cervical intraepithelial neoplasia (CIN) and 2% had CIN III/severe dysplasia (16). Less than 30% of the women had heard of a Pap smear and only 6% had done one prior to the study (16). The study in Trinidad and Tobago also showed that although most women (80%) knew of the Pap smear, only 60% indicated that it could be used to diagnose cervical cancer in its early stages (14). The present study shows that the usefulness and necessity of the Pap smear and VIA screening in cervical cancer detection must be shared with parents as well as pre-adolescents and adolescents and should be reinforced regularly.

Guardians' reluctance in wanting vaccination for their children is reflected in another study done in the USA on African-American and Caribbean girls and parents (17). Studies have suggested that careful planning and improved sensitization using community-based programmes which emphasize cancer prevention awareness would lead to more sustainable vaccination coverage in low and middle income countries (18).

Table 2: Sources of health information of the respondents

Health information sources	Girls (n = 87) n (%)	Guardians (n = 74) n (%)	*p*-value	OR	(95% CI)
Healthcare personnel	15 (17)	25 (34)	0.018	0.41	(0.2, 0.85)
Health centre/Clinic	50 (58)	20 (27)	0.000	3.65	(1.87, 7.10)
TV/Radio	28 (32)	49 (66)	0.000	0.24	(0.13, 0.47)
Family	33 (38)	12 (16)	0.002	3.16	(1.40, 7.22)
Friends/Neighbours	14 (16)	7 (9)	0.25	1.84	(0.70, 4.82)
Books/Magazines	9 (10)	19 (26)	0.01	0.33	(0.14, 0.79)
Internet	15 (17)	26 (35)	0.01	0.38	(0.18, 0.8)

OR: odds ratio; CI: confidence interval

DISCUSSION

This study is one of the few to investigate the knowledge of HPV, HPV vaccine and cervical cancer in pre-adolescent girls as well as adults in Guyana. As found in other studies, knowledge of these parameters is lacking (12, 13). A study in

The challenge, therefore, is to create a stimulating environment, using diverse sources, so that the stakeholders (the girls and their guardians) can be educated with accurate information. Overall, the data from this study indicate that health centres and the media are the main sources of health informa-

tion which both girls and guardians find the most appealing. Other studies have found that adolescents obtain most of their sexual health information from health centres/doctor's clinics (12), from teachers (19), and the Internet (20). However, in the study that identified the Internet, the participants indicated that they were wary of sharing personal information *via* the net; they preferred to interact with HCPs but were not always guaranteed timely access to them (20). Books and magazines were considered as reliable and accurate sources of information (20).

Health education programmes, brochures/pamphlets and 'easy reading books for pre-adolescents' on HPV, the vaccine and cervical cancer can be designed by the National Centre for Educational Resource Development (NCERD) of the Ministry of Education with input from the Health Promotion and Education and the Adolescent and Young Adult Health and Wellness Units of the Ministry of Health to help the stakeholders get the correct information from the main sources. These can be made available at schools and at health centres countrywide. The pamphlets which were given to the participants in this study, after they had completed the questionnaires, were very well received and could be used as a template. These can then be distributed to the health centres throughout the country since this was a popular way for persons to access health information. Poster design/art competitions and/or jingle competitions for children should also be considered and should contain components which clearly show that their guardians had some input. Radio/TV and newspapers could be used for mass media campaigns to address concerns of parents related to the HPV vaccine. Teachers can also be provided with educational tools which will help create a stimulating learning environment where girls can learn about HPV. Efforts should be made to investigate knowledge of HPV, the vaccine and cervical cancer for girls in private schools and schools in rural areas especially the Amerindian communities since data have shown that cervical cancer rates are higher among the Amerindian population (21).

The study was limited by lack of attendance of parents but the researchers decided to interview teachers in the respective schools who had daughters of similar age to that of the target group if parents did not attend. This also resulted in the high percentage of guardians with tertiary level education. It is therefore likely the level of knowledge among parents was even lower than that observed in the present study.

In conclusion, the findings clearly show a lack of knowledge as it pertains to HPV transmission, the vaccine and cervical cancer. There is also a disparity between perceived knowledge and correct knowledge. These shortcomings must be addressed to achieve an efficient and successful HPV vaccination programme and help reduce the incidence of cervical cancer in the country.

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