Population-based survey of school nurses’ attitudes and experiences regarding the human papillomavirus vaccination programme in Sweden

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Abstract

Background: Sweden introduced a school-based human papillomavirus (HPV) vaccination programme in 2012. School nurses are responsible for managing the vaccinations. An efficient vaccination programme is important for achieving high coverage. The aim of the present study was to investigate the attitudes and experiences of school nurses regarding the school-based HPV vaccination programme one year after its implementation.

Methods: Data were collected using a web-based questionnaire in the spring of 2013, and 83.1% (851/1024) of nurses responded.

Results: A favourable attitude towards the HPV vaccination programme was associated with perceived knowledge of, and education about, HPV (both \( p < 0.001 \)). Respondents who worked at schools that received financial support from the Government as compensation for the additional costs of the vaccination programme also had a favourable attitude \( (p = 0.023) \). The majority agreed totally \( (60.8\%, n = 517) \) or partially \( (28.1\%, n = 239) \) that HPV vaccinations should be the responsibility of school nurses, and most also agreed totally \( (41.4\%, n = 352) \) or partially \( (40.1\%, n = 341) \) that boys should also be offered the vaccine. In addition, 66.9% \( (n = 570) \) stated that they had experienced difficulties with vaccinations, and 59.1% \( (n = 337) \) of these considered the task to be time-consuming. Furthermore, 76.1% \( (n = 648) \) had been contacted by parents with questions about the vaccine, which were related mostly to side-effects.

Conclusions: The majority of school nurses were in favour of the school-based HPV vaccination programme. The nurses required adequate knowledge, education, skills and time to address the questions and concerns of parents, as well as information regarding HPV. Strategic financial support is required because HPV vaccination is a complex and time-consuming task.
Keywords: attitude, experience, human papillomavirus, school health, school nurse, vaccination

Background

Human papillomavirus (HPV) vaccination programmes for girls aged 9–14 years have been implemented in many countries worldwide [1, 2]. The vaccination uptake rate for three doses differs between countries, but it is highest where school-based vaccination programmes have been implemented [3, 4], varying from about 70% in Australia [5] to 84% in the UK [6].

In 2012, the quadrivalent HPV vaccine was introduced in a Swedish school-based vaccination programme for girls aged 10–12 years. The first-year coverage for at least one dose was 79% [7]. All of the school-based vaccinations are free of charge, but the parents have to give consent [8]. School nurses are responsible for managing all aspects of the vaccination, including the logistics, providing information to parents and girls, and the administration of the vaccine. The information distributed to parents is standardised by the National Board of Health and Welfare, which ensures that all parents receive equal and uniform information [8]. It is recommended that school nurses work in pairs during vaccination to facilitate the management of adverse reactions. After receiving the injection, the girls are observed for at least 15 minutes. To compensate the School Health Services for this increased workload, the Swedish Government has provided extra financial support to the municipalities. The principal of each school is responsible for the distribution of funding.

The perceptions of Swedish school nurses regarding the HPV vaccination programme were explored during focus group interviews before its implementation [9]. The school nurses considered that the vaccine would be beneficial, but they had doubts about its safety. They were also concerned about their work-load, as well as how they would inform parents about
HPV and obtain informed consent. In general, the school nurses supported the implementation, and they believed that it would decrease inequalities between families with differences in their socio-economic status [9]. In the UK, where the school-based vaccination programme started in 2008, school nurses believed that HPV vaccination was a way to minimise health inequalities, although the procedure gave them less time for other crucial responsibilities such as supporting vulnerable pupils [10, 11].

Recently, we explored parents’ experiences of the school-based HPV vaccination programme [12, 13]. Parents who gave their consent for their daughters to be vaccinated believed that the provision of the vaccine within the School Health Service was convenient and reliable [12]. By contrast, parents who did not give consent had less trust in the Government recommendation and believed that this was a complex decision, which they preferred to postpone. They also considered that the information provided by the School Health Service was insufficient, and they believed that the daughters needed a more individual and considerate treatment than was possible by mass vaccination [13].

An efficient vaccination programme is important for achieving high coverage, and school nurses play a key role in the success of school-based HPV vaccination programmes. Thus, the aim of the present study was to investigate the attitudes and experiences of school nurses regarding the school-based HPV vaccination programme one year after its implementation in Sweden.

**Hypothesis**

The hypothesis was that there would be associations between the favourable attitudes of school nurses regarding the HPV vaccination programme and: (i) their perceived knowledge of HPV vaccinations, (ii) the education they received about HPV and (iii) the financial support given to the School Health Services.
Methods

Design

A cross-sectional web-based survey was carried out in Sweden between March and May 2013. The school nurses eligible for inclusion were those who participated in the school-based HPV vaccination programme. At the time of the study, there were 2438 registered school nurses in Sweden, and 1024 participated in the school-based HPV vaccination programme.

Procedure

Nurses were recruited via the official website of the Swedish Association of School Nurses. One of the researchers (CS) sent an email explaining the study’s aim and procedure to all of the heads of the School Health Services, as well as a request to inform the school nurses in each municipality about the study and to invite them to participate. More information was available on the website, including a statement that participation in the study was voluntary and confidential. Those who agreed to participate were asked to complete the web-based questionnaire. Reminders were sent by email to the heads of the School Health Services on two occasions; i.e., two and four weeks after the first invitation. The study was approved by the Regional Ethical Review Board in Uppsala, Sweden.

Questionnaire

The questionnaire was based on previous studies [9, 14] and clinical experience. The first part captured background demographic data, with questions about age, gender, years of experience as a school nurse, responsible school authority (public or private) and geographical area (rural, semi-urban or urban). The main part of the questionnaire comprised questions about
the education and support given to nurses before the implementation, information provided to families by the school nurse and the school nurse’s perceived knowledge of, and attitude towards, HPV vaccination. The questions had multiple choice alternatives, which were rated using four-point verbal scales that ranged from “totally agree” to “totally disagree”. The face and content validity [15] were tested using a group of 10 school nurses, who were asked to assess the relevance of the questionnaire and to indicate whether they experienced any difficulties or ambiguity during its completion. Some revisions were made, and the final version comprised 26 questions, including two open-ended questions that asked participants to state the most common question asked by parents and to describe their perceived difficulties with HPV vaccinations. These open-ended questions were analysed by systematically organising and categorising the answers.

In the present study, the definition of a favourable attitude towards HPV vaccination was that the school nurse agreed, totally or partially, that the introduction of HPV vaccinations into the general childhood vaccination programme was appropriate and that school nurses should be responsible for these vaccinations.

**Statistical analyses**

Categorical and ordinal data were expressed as frequencies (n) and percentages (%), whereas continuous data were expressed as the means and ranges. Associations between ordinal variables were tested with Spearman’s ρ, and the associations between categorical and ordinal variables were examined using Mann–Whitney and Kruskal–Wallis tests. In all analyses, two-sided p-values < 0.05 were considered statistically significant. The statistical analyses were performed using IBM SPSS Statistics version 20.0.
Results

In total, 83.1% (n = 851/1024) of the school nurses from all of the counties in Sweden completed the web-based questionnaire. The background characteristics of the participants are presented in Table 1.

Attitudes to HPV vaccination

Table 2 shows that the majority of nurses totally or partially agreed that it was appropriate that HPV vaccinations were introduced into the general childhood vaccination programme and that school nurses should be responsible for the vaccinations. Most participants agreed, totally or partially, that boys should also be offered the HPV vaccine in the school-based vaccination programme. One out of 10 believed that a provider other than the School Health Services, such as primary care 8.7% (n = 74) or a vaccination agency 1.3% (n = 11), would be more appropriate.

In addition, 67.5% (n = 574) of school nurses considered that it was appropriate to vaccinate girls aged 10–12 years, whereas 28.0% (n = 238) thought that 13–14 years was a more suitable age, and 4.5% (n = 39) stated that the vaccine should be given at ≥ 15 years.

In their answers to the open-ended question, 67% (n = 570) of the participants reported difficulties with the HPV vaccinations, including some who had encountered more than one difficulty. We found that 32.4% (n = 276) of the school nurses had doubts about vaccination at such a young age, while 59.1% (n = 337) considered that the HPV vaccination programme was time-consuming, and 20.2% (n = 115) believed that their work-load had increased. They believed that it would be easier to motivate parents and to provide information to girls if it was offered later because most Swedish girls are not sexually active before the age of 15.

Fears of needles and pain were highlighted by 26.0% (n = 148) of nurses, and 14.9% (n = 85)
of the respondents reported logistical problems with the time intervals between the three doses. One school nurse expressed her difficulties as follows: “The HPV vaccinations increase our work-load, because they are very time-consuming and require a lot of planning. Therefore, it is challenging to find time for other preventive efforts”.

Educational experiences of school nurses and information received about HPV vaccination

Table 3 shows the school nurses’ preparedness and perceived knowledge about HPV vaccination. There was a positive correlation between the nurses’ perceived knowledge about the vaccine and a favourable attitude towards vaccination ($\rho = 0.191; p < 0.001$). There was also a positive correlation between the education that they received before the implementation and a favourable attitude ($\rho = 0.025; p < 0.001$).

In total, 75.5% (n = 643) of the respondents were educated about HPV before the implementation at a local level; i.e., education organised by their employer. In addition, 66.4% (n = 565) obtained information themselves, and 22.6% (n = 192) participated in education organised by The National Board of Health and Welfare or other national education programmes. However, 5.5% (n = 47) of the nurses received no education about HPV. The majority (92.6%, n = 788) were content with both the Government’s information and the information provided by the drug companies.

Most of the school nurses (97.3%, n = 828), sent standardised written information to the parents, and 20.6% (n = 175) also provided information at parental meetings. In addition, 34.1% (n = 290) of the school nurses provided information by email or telephone if they were contacted by the parents. We found that 54.7% (n = 466) informed the girls separately before the vaccination, whereas 30.8% (n = 262) informed both girls and boys together, and 14.5% (n = 123) did not inform the pupils verbally before the vaccination. The majority of the school
nurses (76.1%, n = 648) were contacted by parents who had questions about the vaccine. Most of these questions (54.8%, n = 355) were related to the side-effects of the vaccine, while the other queries raised by parents were concerned with vaccination at such a young age (18.8%, n = 122) and the long-term effects of the vaccine (13.1%, n = 85). Moreover, 13.3% (n = 86) were contacted by parents for advice about the vaccination. One school nurse illustrated a parent’s concerns as follows: “Is the vaccine reliable, and what are the common side-effects? Is it necessary to vaccinate a girl aged 10–12 or is it possible to wait until she is older?”

Financial support from the Government

There was a statistically significant ($p = 0.023$) correlation between financial support from the Swedish Government and a favourable attitude towards vaccination, provided that the financial support had been used to fund an extra nurse or additional work time. The nurses who worked at the schools that used the money to fund the costs of an additional school nurse had a significantly ($p = 0.015$) more favourable attitude towards HPV vaccination compared with those who worked at schools where the money was not used to compensate for the additional expenditure incurred by the vaccinations. The majority of the participants (76.6%, n = 652) reported that as far as they knew, the financial support had not been used to cover the extra expenses incurred by HPV vaccinations.

Discussion

To the best of our knowledge, this is the first study to examine the attitudes and experiences of school nurses regarding a HPV vaccination programme at the population level. The main findings of the present survey, which was performed one year after the implementation of the Swedish school-based HPV vaccination programme, were positive correlations between the
school nurses’ favourable attitudes towards the programme and: (i) perceived knowledge of HPV, (ii) education received about HPV, and (iii) financial support being used to cover the additional expenditure incurred by the vaccinations.

An encouraging finding was that most of the school nurses considered that they had adequate knowledge to conduct the vaccination procedure. School nurses have a key role in the success of the implementation of vaccination programmes [10, 11], so they need adequate knowledge and skills to ensure that they feel comfortable with all the procedures related to the vaccinations. Education and knowledge were associated with a favourable attitude towards the vaccination programme. Thus, the nurses who favoured the HPV vaccinations and were confident with their training were probably more at ease when providing information to parents and children, managing their concerns and obtaining informed consent.

It was surprising that almost eight out of 10 school nurses had been contacted by parents who had additional questions about the vaccine, especially about its side-effects. The extensive debate in Sweden about the risk of narcolepsy after vaccination against influenza (A) H1N1 may have contributed to their concerns [16]. In our previous studies [12, 13] of the parental reasons for accepting or declining HPV vaccination, we found that a fear of side-effects after swine flu vaccination was a reason for declining [13]. The safety profile of the HPV vaccine is well established, and no severe adverse effects have been found [17]. Thus, if this information is highlighted more clearly in the written information provided to parents, some of their concerns may be alleviated. This would also make the task of obtaining informed consent easier for school nurses.

The school nurses perceived that they had an increased work-load and had less time for other preventive tasks. This was also reported in studies from the UK [10, 11, 18]. The majority of the school nurses stated that the Swedish Government’s financial support for the implementation of the HPV vaccination programme had not reached the School Health
Service. Thus, it was not surprising that approximately three-fifths of the respondents reported
difficulties with implementing the programme because of time constraints. Thus, it is
important to identify strategies that provide financial support to cover the additional
expenditure incurred by the vaccinations directly, thereby ensuring the continued success of
the HPV vaccination programme.

School nurses have a unique position in preserving and creating equitable health [9, 11].
This might have been reflected in the finding that the majority agreed that boys should also be
vaccinated. Other childhood vaccinations are offered to both boys and girls, so the exclusion
of boys may be viewed as an ethical dilemma, which has also been noted by Malmqvist et al
[19, 20]. Another consideration was the attitude to the age of girls when they received the
vaccination, where one-third believed that girls should be slightly older because it would have
been easier to provide them with suitable information about HPV. Six out of 10 school nurses
also believed that parents who did not consent should be offered the option of having their
daughter vaccinated at a later time. This agreed with our previous findings about parents not
consenting to vaccination [13]. Therefore, we suggest that the School Health Service should
adopt a more flexible approach to improve the uptake of the vaccination. However, it is
important to emphasise that the vaccine is prophylactic, and parents should be informed that it
needs to be received before exposure to HPV; i.e., before sexual debut.

Strengths and limitations

A major advantage of this study was the high response rate. School nurses participated from
all of the counties in Sweden, which means that the results may be generalised to the whole
population of school nurses involved in the HPV vaccination programme. The use of a web-
based survey allowed many nurses to participate and to respond within a short period. A
possible limitation is that we cannot prove that only school nurses answered the
questionnaires. The national official web page was directed exclusively to school nurses, but personal identification was not required before completing the questionnaire. To overcome this limitation, we checked all of the demographic data to ensure that no school nurses had responded more than once. Another possible limitation is the lack of information about non-responders.

It would have been interesting to investigate whether the attitudes of the school nurses correlated with the coverage rate, but this was not feasible because of the lack of reliable information. Since January 2013, it has been mandatory to report all vaccinations to the National Vaccination Registry in Sweden, and we intend to repeat this study in the near future.

Conclusions

The majority of the school nurses were in favour of the school-based HPV vaccination programme, despite the increased work-load that it incurred. However, school nurses need adequate resources so that they can provide information to parents and answer their questions and concerns. HPV vaccination is a complex and time-consuming task, which demands knowledge, skills, time and, ultimately, financial support.

Abbreviations

HPV: human papillomavirus

Acknowledgements

The authors wish to thank the Swedish Association of School Nurses, who gave their permission to publish the questionnaire on their web site. Special thanks are also given to all of the school nurses who participated by completing the questionnaire.
Funding

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Competing interest

The authors declare that they have no competing interests.

Authors’ contributions

All authors are responsible for reported research. All authors have participated in the concept and design; analysis and interpretation of data; drafting or revising of the manuscript. MG composed the initial manuscript, revised and submitted the final manuscript. Statistical analyses were initially performed by CS and AR. All authors have approved the final manuscript.

References

coverage in low- and middle-income countries. *Bull World Health Organ* 2011, 89:821–30B.


Content/immunise-hpv].


7. Swedish Institute for Communicable Disease Control [Smittskyddsinstitutet]. *Statistics for HPV vaccinations.* [http://www.smittskyddsinstitutet.se/nyhetsarkiv/2013/stor-

andel-flickor-vaccinerade-sig-mot-hpv/].

lakemedel/vacciner/samtyckesblankett].


Table 1 Demographic and professional characteristics of the participating school nurses (n = 851)

<table>
<thead>
<tr>
<th>Demographic variable</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>52</td>
<td>25–66</td>
</tr>
<tr>
<td>Years as a school nurse</td>
<td>9</td>
<td>1–42</td>
</tr>
<tr>
<td><strong>Frequency (n)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>840</td>
<td>98.7</td>
</tr>
<tr>
<td>Men</td>
<td>11</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Employment</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public school</td>
<td>781</td>
<td>91.8</td>
</tr>
<tr>
<td>Private school</td>
<td>70</td>
<td>8.2</td>
</tr>
<tr>
<td><strong>Geographical area of the school</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>209</td>
<td>24.6</td>
</tr>
<tr>
<td>Semi-urban</td>
<td>296</td>
<td>34.8</td>
</tr>
<tr>
<td>Urban</td>
<td>346</td>
<td>40.6</td>
</tr>
</tbody>
</table>
**Table 2** School nurses’ attitudes towards human papillomavirus (HPV) vaccination (n = 851)

<table>
<thead>
<tr>
<th></th>
<th>Totally agree n (%)</th>
<th>Partially agree n (%)</th>
<th>Partially disagree n (%)</th>
<th>Totally disagree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>It is appropriate that HPV vaccination was introduced into the general childhood vaccination program.</td>
<td>544 (63.9)</td>
<td>239 (28.6)</td>
<td>54 (6.2)</td>
<td>11 (1.3)</td>
</tr>
<tr>
<td>The school nurse should be responsible for the HPV vaccinations.</td>
<td>517 (60.8)</td>
<td>239 (28.1)</td>
<td>68 (8.0)</td>
<td>27 (3.2)</td>
</tr>
<tr>
<td>Boys should also be offered the HPV vaccine in the school-based vaccination program.</td>
<td>352 (41.4)</td>
<td>341 (40.1)</td>
<td>113 (13.3)</td>
<td>45 (5.3)</td>
</tr>
<tr>
<td>HPV vaccination is more painful than other vaccinations.</td>
<td>232 (27.3)</td>
<td>302 (35.5)</td>
<td>172 (20.2)</td>
<td>145 (17.0)</td>
</tr>
<tr>
<td>Fear of needles is a problem.</td>
<td>198 (23.3)</td>
<td>375 (44.1)</td>
<td>176 (20.7)</td>
<td>102 (12.0)</td>
</tr>
<tr>
<td>Those who decline vaccination should be offered the vaccination later.</td>
<td>271 (31.8)</td>
<td>238 (28.0)</td>
<td>184 (21.6)</td>
<td>158 (18.6)</td>
</tr>
<tr>
<td>I have sufficient confidence in the authorities’ decisions about HPV vaccination.</td>
<td>393 (46.2)</td>
<td>356 (41.8)</td>
<td>81 (9.5)</td>
<td>21 (2.5)</td>
</tr>
<tr>
<td>HPV vaccination may result in decreased condom use.</td>
<td>54 (6.3)</td>
<td>377 (44.3)</td>
<td>257 (30.2)</td>
<td>163 (19.2)</td>
</tr>
<tr>
<td>HPV vaccination may result in an increased number of sexual partners.</td>
<td>31 (3.6)</td>
<td>167 (19.6)</td>
<td>335 (39.4)</td>
<td>318 (37.4)</td>
</tr>
<tr>
<td>HPV vaccination may improve the awareness of sexually transmitted infections.</td>
<td>199 (23.4)</td>
<td>527 (61.9)</td>
<td>95 (11.2)</td>
<td>30 (3.5)</td>
</tr>
<tr>
<td>HPV vaccination may reduce participation in Pap smear tests.</td>
<td>72 (8.5)</td>
<td>466 (54.8)</td>
<td>227 (26.7)</td>
<td>86 (10.1)</td>
</tr>
</tbody>
</table>
Table 3 School nurses’ preparedness and perceived knowledge about human papillomavirus (HPV) vaccination (n = 851)

<table>
<thead>
<tr>
<th></th>
<th>Totally agree n (%)</th>
<th>Partially agree n (%)</th>
<th>Partially disagree n (%)</th>
<th>Totally disagree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have read the Government’s information about HPV.</td>
<td>661 (77.7)</td>
<td>136 (16.0)</td>
<td>54 (6.3)</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>I have read the drug company’s information about HPV.</td>
<td>476 (55.9)</td>
<td>299 (35.1)</td>
<td>70 (8.2)</td>
<td>6 (0.7)</td>
</tr>
<tr>
<td>I have adequate perceived knowledge to inform parents.</td>
<td>481 (56.5)</td>
<td>296 (34.8)</td>
<td>61 (7.2)</td>
<td>13 (1.5)</td>
</tr>
<tr>
<td>I have adequate perceived knowledge to inform girls.</td>
<td>529 (62.2)</td>
<td>226 (26.6)</td>
<td>96 (11.3)</td>
<td>0 (0.0)</td>
</tr>
</tbody>
</table>