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HPV vaccination and sexual health in France: Empowering girls to decide

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ABSTRACT

Objective: Vaccination coverage against HPV in France is among the lowest in the industrialized world, although the public authorities have recently become aware of this issue. Few studies have looked at teenaged girls' representations of this vaccination, even though they are the most concerned by it. This qualitative study explored the experiences and representations of HPV vaccination by adolescent girls seeing doctors at least occasionally.
Study Design: We used a written essay question to explore this issue among 101 adolescent girls at six urban medical centers and a semi-structured interview to discuss it in further depth with five of them. The analysis was lexicometric (ALCESTE®) and phenomenological (Interpretative Phenomenological Analysis).
Results: These results are organized around four superordinate themes: the teenage girls' factual knowledge about this vaccine, their motives for and obstacles to vaccination, their involvement in this decision, and finally the need for information about and solutions to this issue.
Conclusions: Teenage girls know little about this vaccine and are more sensitive to the emotional discourse that surrounds it than to rational knowledge about it. The requirement for parental authorization for this vaccine reinforces the girls' lack of investment. Vaccination programs should integrate the HPV vaccine more thoroughly into general prevention concerning sexual health and should send a strong signal by offering minors anonymous vaccination free of charge, as is already the case in France for requests for contraception, the morning-after pill, elective abortion, and screening and treatment of sexually transmitted infections.

1. Background

Forty serotypes of human papilloma virus (HPV) are associated with the risk of genital infection and around 15 with the risk of cervical cancer [1]. This virus responsible for 2800 cases of cervical cancer and more than 1000 deaths in France each year [2] and for 630,000 new cases of cancer worldwide per year [3]. Vaccination against it is, together with cervical screening, the means of preventing most of these cancers [4]. HPV vaccination has been available since 2007 for the prevention of cervical and other genital cancers in France. The two vaccines (HPV 4, 2) available at the time of our study protect against serotypes 16 and 18, which are linked to 70% of these cancers [5]. In August 2018, a third vaccine — HPV 9, a nonavalent vaccine protecting against an additional five serotypes – became available in France. It thus covers seven serotypes responsible for over 90% of cervical cancers [6].

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Health policies and legislation about vaccination and vaccine access vary quite substantially between high income countries. Consequently, coverage rates range from very low (<20%) to very high (>85%). Countries with a national vaccination program most often at least reach the minimum rate of 50%, while countries offering so-called "opportunistic" vaccination (a very limited number of mandatory vaccinations, with physician encouragement about other recommended vaccines whenever the opportunity arises) most often have rates substantially below that [7–11]. French HPV vaccination coverage is extremely low (<20%), especially because of the paradoxical role of doctors who must defend the benefits of vaccination about which they are not entirely convinced [12].

Teenage girls today are increasingly involved in the medical care that concerns them, and it appears useful to ask what they know about this vaccine. Few studies in France or elsewhere have examined this question [13–17]. All of them, however, report a lack of knowledge and information about the risk of this infection and the effectiveness and safety of the vaccine, even in countries with high vaccination coverage [15,17–19]. Girls most often appear to be relatively unconcerned about access to either information or the vaccine, even though they are directly involved [20,21]. Finally, in France they are paradoxically excluded from the decision about this vaccination, given the requirement for parental authorization, even though they can obtain contraceptives and an elective abortion, as well as treatment for sexually transmitted infections, without their parents' agreement [22]. In this French context, which is paradoxical at several levels, an in-depth exploration of adolescent girls' experiences with this vaccination appears useful to improving our understanding of their role in the decision about whether or not to be vaccinated.

2. Method

We conducted a multicenter qualitative study in six medical centers specialized in adolescent care (Corbeil, Créteil, Paris 14, Paris 16, Poissy, and Toulouse). An appropriate ethics review board approved the protocol.

2.1. Participants

We included adolescent girls who consented to participate, with their parents' consent. They could be inpatients or outpatients and were aged from 11 through 19 years. Because our goal was to explore rather than test their knowledge about this vaccination, we chose a clinical population, assuming that they were better informed and more involved in medical care than the general population. Accordingly, they would have more explicit positions, which would facilitate our exploration.

2.2. Data extraction

The girls and their parents received information about our research project and provided written consent. We then asked the girls to answer one yes/no question ("have you been vaccinated against HPV?") and to respond to the following essay question: *"What do you know about vaccination against HPV? What is it for? Depending on whether or not you are vaccinated, what was your decision based on? What might have made this choice complicated? Write what you know about this subject for the next 20 min. Our researchers will study what you wrote to enable them to have a better understanding of teenage girls' point of view about this vaccination*". The relatively long response period should have allowed the teens to draft a text of at least several lines. When the text was particularly relevant because of an original perspective, broad knowledge on the topic, or an interesting suggestion, we recontacted the teenage girl to conduct an individual free interview to explore the relevant points raised in her writing. All five girls asked to participate agreed. One researcher trained in semi-structured interviews conducted all the interviews (SS). The interviews lasted one hour, took place in the medical unit, and were recorded. All the data – interviews, and handwritten responses– were transcribed verbatim and included in the qualitative analysis.

2.3. Data Analysis

We conducted two different types of qualitative analyses: the first applied the principles of interpretative phenomenological analysis (IPA) [23], using no computer assistance, while the second used ALCESTE® software (Analyse des Lexèmes Co-occurents dans un Ensemble de Segments de Textes, or Analysis of Co-occurring Lexemes in a Set of Text Segments) [24].

We began with IPA and constructed a thematic framework from independent analyses by two researchers (HL and JL). The entire research team met repeatedly to discuss these results. The entire dataset, that is, the transcripts of all essays and all interviews, was repeatedly read and then coded to identify initial themes, which were annotated in the margins. Recurrent themes were then identified across transcripts. This stage involved a more analytical ordering, as we tried to make sense of the connections between themes. Some of the themes tended to cluster. The process was dynamic and cyclic, with each transcript leading to the collection and analysis of further data, which could modify previous results. The aim was to recognize ways in which narratives from the participants were similar but also different. The last stage was to produce a coherent ordered table of the themes [23].

Next we analyzed the textual data, using the statistical clustering procedures encoded in ALCESTE® software. ALCESTE is not hypothesis-driven. It constructs an overview of patterns found in the text (classes) according to how often roots and word forms appear together, for example, by performing different types of hierarchical descending classifications. It does not quantify the text, but simply counts repetitions of associations of words sufficiently close together and thus enabled us to construct groups of words to be interpreted as themes by the researchers.

Finally, the results of each analysis were compared, and the ALCESTE-assisted findings were used to refine the IPA-generated categories. Classes were connected to themes when it made sense, and themes were reorganized to consider the additional or new meaning provided by the software analysis. If no theme could be connected to a text class, a new theme could be constructed.

3. Results

3.1. Characteristics of the adolescent girls

In all, 101 teenage girls (80% of those asked to participate) completed the essay question. Their mean age was 15.5 years (range: 11–19). Half were receiving outpatient care, and half were inpatients. In all, 24% reported they had been vaccinated against HPV. Five girls were enrolled in a semi-structured interview (Table1).

3.2. ALCESTE analysis

A total of 10,216 words were analyzed, corresponding to 1292 unique shapes distributed in 284 elementary contextual units (ECU). The software classified 76% of the corpus into four lexical classes. Two different hierarchical descending analyses revealed a dendrogram containing four classes (Fig. 1). Classes 3 ("active decision") and 4 ("factual knowledge") were closely linked together;

Table 1
Characteristics of the young women interviewed.

ID	Age	School level	Rural/Urban	Actual care (inpatient/outpatient)	Main diagnosis
ITW 1	14.5	8th grade	urban	oupatient	Obesity
ITW 2	18	12th grade	urban	outpatient	Chronic pain
ITW 3	17.5	11th grade	urban	inpatient	Eating disorder
ITW 4	15.5	10th grade	urban	inpatient	Diabetes mellitus
ITW 5	19	12th grade	rural	inpatient	Eating disorder

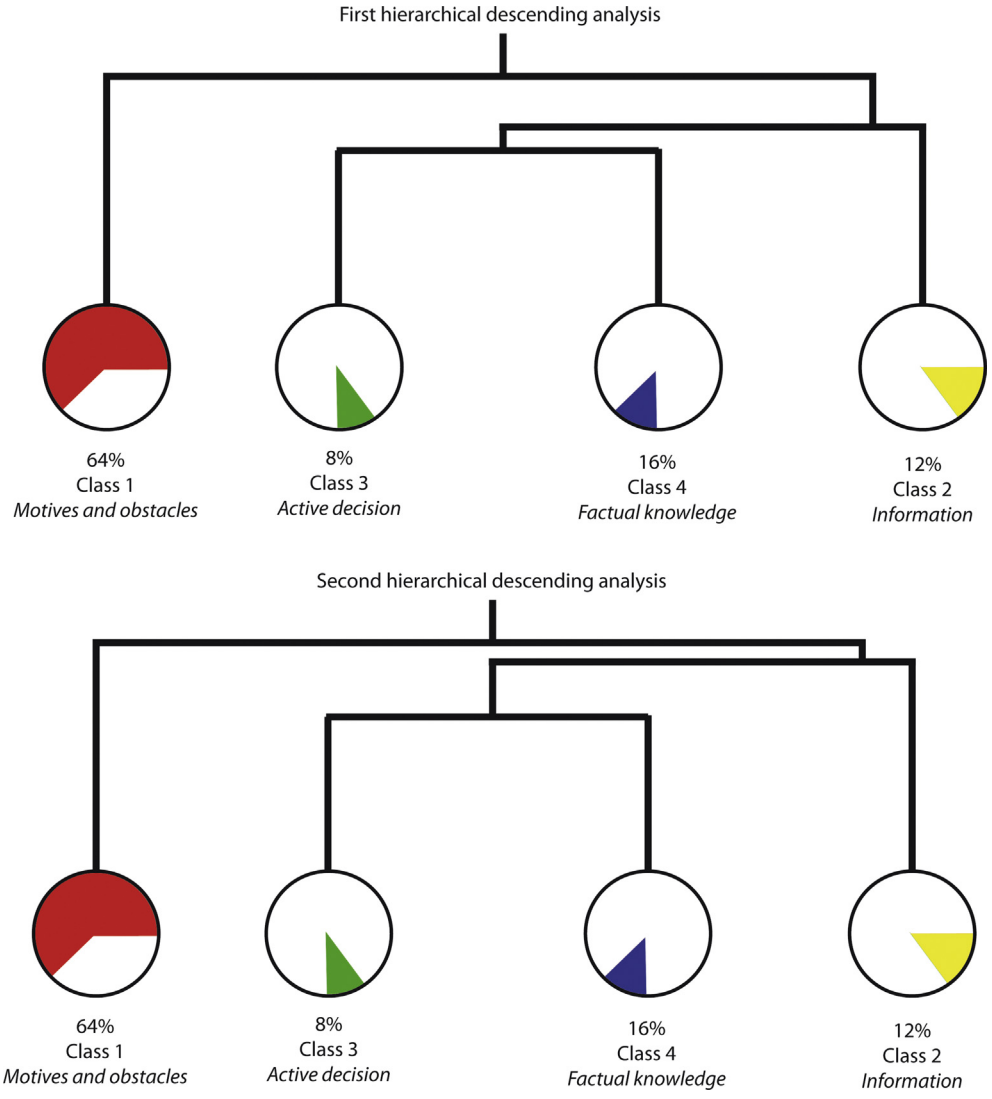

Fig. 1. Dendrogram of the classification of ECUs: two descending hierarchical classification with the percentage of ECUs classified and created by ALCESTE software.

they were also linked, but less closely, with Class 2 ("information"). Class 1 ("motives and obstacles") was separate from the others. These different classes made it possible to confirm and reinforce the themes constructed in the phenomenological analysis (Table 2).

3.3. Thematic analysis

We decided to organize our results around four superordinate themes: *The teenage girls' factual knowledge about vaccination, their motives for and obstacles to vaccination, their involvement in the decision about vaccination, and finally the need for information about and solutions to this issue* (Table 3).

3.3.1. Adolescents' factual knowledge about vaccination

The main thing that the girls knew about vaccination against HPV was its principal indication: prevention of the risk of cervical cancer. Some adolescents associated this risk more precisely with that of an infection that occurs during sexual intercourse and is prevented by vaccine immunization against HPV. They are aware of its recommended — and therefore not mandatory — nature as well as that the indication is reserved for girls, and they never questioned this point. Their knowledge was otherwise more vague about the type of cancer associated with HPV, the vaccination schedule, and the mode of transmission. The mode of HPV transmission or the indication for vaccination against it were sometimes described by somewhat fantastical remarks: quite often, the girls

Table 2
Classes descriptions and associated themes.

	Title	% of the Classified ECUs	Typical words (χ^2)	Antitypical words	Description of the class and association with the theme	Associated theme
Class 4	Factual knowledge	15.96	Anti-papillomavirus (66), uterus (56), cervix (54), cancer (48), serve (46), adolescent (32), vaccinate (31), allow (27), prevent (26), woman (24), protect (22), sexual (19)	Parents, doctors, think	The vocabulary/lexicon is very impersonal, exterior to the subject: the vocabulary here is medical: vaccinate, cervical cancer, uterus.The verbs are action verbs but are attributed to exterior objects: the vaccine allows, protects, prevents. The so-called factual knowledge about the vaccine is intellectualized. Absence of the teen's emotional involvement.	Adolescents' factual knowledge about vaccination
Class 1	Motives and obstacles	63.85	Go (10), do (8), see (7), thing (5), desire (5), take (5), important (5), friend (4), sick (4), school (3), middle school (3), campaign (3), effective (3), mandatory (3)	Anti-papillomavirus, uterus, cancer, cervix, vaccinate	The principal grammatical categories are markers of a temporal or deductive or logical relation, or of intensity. It is the mark of a discourse intended to convince, explain, and show how a personal position can evolve over time. It is also the only class where "I or me" appears, which shows the personal or intimate value of the words. The emotional involvement is stronger and testifies to a reflective pathway that will conclude by a choice (class 3).	Motives for **and** obstacles to vaccination
Class 3	Active decision	8.45	Complicate (1 0 2), choice (55), know (14), think (13), negative (9), positive (9)	Do, talk, go	The vocabulary associates choice/decision with know, think, and complicate, in discussing both positive and negative choices. The grammatical categories represented most often are verbs and function words, which show the active side of the discourse. The decision is thus an active choice, underlying the teen's involvement.	Adolescents' involvement in the vaccination decision
Class 2	The information	11.74	Hear (59), not much (23), talk (20), act (16), accept (16), say (9), hesitate (9), youth (4), parents (4), doctor (4)	Do, disease, mother	The vocabulary brings together the verbs say, hear, talk to not say much and people who talk about it, doctors, parents, and young people. The markers of modelling are most present in this class. The observation of lack of information lead the researcher and teen to design solutions for better information	The need for information **and** solutions

knew nothing about the virus or the vaccine, regardless of their vaccination status.

3.3.2. Motives for and obstacles to vaccination

The principal reasons in favor of vaccination against HPV were adolescent girls' general interest in their health and the prevention of the risk of HPV transmission during sexual relations as well as of its risks of cancer, and death. The non-mandatory nature of this vaccination requires that individuals develop their own personal reasons to have it.

Numerous obstacles to vaccination against HPV were described, most often loaded with emotions and worries.

Many interviewees mentioned the link between HPV and sex. Sex is a taboo subject that is difficult to raise with one's parents. Discussion of this vaccine implicitly assumes sexual activity to come, which nonetheless remains essentially hypothetical for the girls and frightening for the parents. The presumed association between HPV infection and at-risk sex makes the need for the vaccine still more hypothetical.

Teenaged girls clearly feared side effects associated with the HPV vaccine: these complications were sometimes described as serious and could cause them to be worried or even to oppose vaccination. Some adolescents considered that side effects are uncertain, but they have heard rumors, and they feel that prudence requires them to step back from this vaccine perceived as too recent.

Finally, the girls mentioned the fear of injections and their pain, complicated family contexts – including family history of autoimmune or degenerative neurological diseases –, or even the cost of the vaccine.

3.3.3. Adolescents' involvement in the vaccination decision

Decision-making about vaccination always involves an active choice by the girl, whether it is positive or negative, complicated or simpler. While the choice most often responds to the parents' expectations or the doctor's recommendation, girls looking for autonomy, independence, actively appropriate the decision. This active position therefore appears at a later point, most often after passive indifference and submission to the choice imposed by the parents. Vaccinated girls were more involved in the decision and more frequently shared arguments for or against HPV vaccination than nonvaccinated girls.

3.3.4. The need for information and solutions

The teenage girl's lack of involvement at the time of the decision is associated in her discourse with lack of personal knowledge about vaccination. Doctors are the principal source of information, but they do not always routinely offer vaccination and what they have to say is not always sufficient to answer girls' questions.

Table 3
Direct quotations from participants' interviews and questionnaires.

Adolescents' factual knowledge about vaccination	
More or less specific knowledge	"I know that it's a vaccination against cervical cancer." *ITW3*
	"I don't know if I remember right if it's related to the uterus or the vagina." *Essay question*
	"[This vaccination] isn't mandatory, but it is recommended." *Essay question*
	"I think you need to have boosters for this vaccine several times over your lifetime." *Essay question*
	"I know that the papillomavirus is a contagious virus and it is also sexually transmissible." *Essay question*
	"It's a sexually transmitted diseases that girls get." *ITW4*
Fantastical ideas	"It's a preventive vaccine just in case a dangerous butterfly stings you and you catch a virus." *Essay question*
	"An important vaccine since you can catch these bacteria very easily in dirty toilets, for example." *Essay question*
No knowledge	"I've never heard of it." *Essay question*
	"I didn't even know there was a vaccine against that." *Essay question*
	"We're not really super-informed about vaccines, so we don't talk about it too much." *ITW3*
Motives for and obstacles to vaccination	
Personal and family motives/reasons	"All adolescents think about their health." *Essay question*
	"Sexual relations are not rare in adolescence and it's better to be protected." *Essay question*
	"Yes, I'd like to save my life, so yes, I'd like to be vaccinated!" *ITW2*
	"It's reassuring to tell yourself you're vaccinated because that reduces the risks of a dangerous disease that can prevent women from experiencing the happiness of being a mother." *Essay question*
	"My mother has talked to me about this vaccine a lot because she has papillomavirus." *Essay question*
The association between HPV and sex	"I think that at a certain age, these are thing we don't talk about. It's a little taboo, I think, so we talk less freely." *ITW3*
	"Because this cancer is essentially due to frequent sexual activity, not necessarily healthy and not considering myself promiscuous, I don't think it's necessary." *Essay question*
Fear of side effects	"Moreover, many girls . . ./. . . have become sterile or paralyzed." *Essay question*
	"All the people I know who have done it had, for example, toe necrosis." *Essay question*
	"They told me it might have permanent effects on the body. . ." *Essay question*
	"[My friends] say the vaccine is more dangerous than the disease." *Essay question*
	"I think we have to wait at least 3 generations to see if it's effective, and it's necessary to verify that the person who was vaccinated had children and that it didn't have any effects on the children." *ITW5*
Adolescents' involvement in the vaccination decision	
A decision imposed by the parents or physician	"My mother decided to have me vaccinated." *Essay question*
	"I'm not the one who made this decision." *Essay question*
	"My parents made this decision on the doctor's advice." *Essay question*
	"My mother talked to me about it and made me do it." *Essay question*
	"No, I didn't really have a choice *Essay question*
Adolescents' passivity in the face of the parents' decision	"I agreed, but I'm not really sure why." *Essay question*
	"My parents refused, I didn't really worry about it." *Essay question*
	"My GP and my parents were for it, so I agreed very easily without really know exactly what it was." *Essay question*
Active re-appropriation by the adolescent	"I trust my mother and my doctor, who I've known a long time." *Essay question*
	"I'm against it, as is my doctor." *Essay question*
	"I decided not to be vaccinated." *Essay question*
The need for information and solutions	
The doctor, principal source of information	"My pediatrician talked about a vaccine against cervical cancer." *Essay question*
	"My pediatrician explained a little bit to me about the papillomavirus vaccine." *ITW4*
The need to provide better information	"Everyone says that you need to be vaccinated, without explaining why or what that might involve." *Essay question*
	"It might be better to inform women about the beneficial effects of the vaccine, with real proof, that would be reassuring." *Essay question*
	"They explain what puberty is, what periods are, they talk about sexually transmitted infections, but more about AIDS than about papillomavirus." *ITW1*
Information in schools	"It would be good to inform young people more about this vaccine, in more depth, especially in high schools, and do what's necessary to make high school students interested in this subject." *Essay question*
	"To start with, they need more interventions in schools and middle schools." *ITW4*
Criticisms and proposals	"There are posters sometimes in doctors' waiting rooms, but we don't necessarily look at them!" *ITW2*
	"Maybe make an ad campaign on TV, like advertising but with messages about vaccination." *ITW3*
	"Why not make a character or mascot based on HPV; that would be not bad at all!" *ITW2*

Many teenage girls formulated requests for information about vaccination generally and that against HPV in particular, so that they could form their own opinion about how the vaccine was discovered, its indication, effectiveness, and risks. This should enable them to participate in the decision about whether or not to be vaccinated.

They thus made suggestions to improve the information they receive, pointing first to the school setting (teachers and preventive medicine). They underlined the feeble impact of poster campaigns in health centers or mail campaigns. They asked for information via media addressed to young people (television, internet) and at meeting places at vaccination sites.

4. Discussion

Our study looked at the perspectives about HPV vaccination of adolescent girls receiving medical care as out- or in-patients at a French hospital. The principal finding is the girls' lack of knowledge about this vaccination. The knowledge that some of them have is insufficient to allow them to be involved in an individual decision for which they can assume responsibility.

Numerous countries with high vaccination coverage against HPV organize mandatory vaccination programs, most often in school settings [14]. The question of individual choice here gives way to the collective benefit. In this case, if the information is not always judged sufficient, vaccination appears nonetheless a normative process: vaccination becomes the rule. Contrary to other vaccinations that France made mandatory for infants in 2018 [25], the government continued its opportunistic vaccination system for HPV, based on individual decisions and, for those younger than 18 years, subject to parental authorization. This system requires that the person concerned or the decision-maker have sufficient individual motivation. Two issues are thus presented: the first is that of the girl herself. Well-informed, she can play an active role in the vaccination

decision [13,15,17]. The other is the role of the parents, who currently must agree to their daughter's vaccination [14,26,27].

The difficulties in providing information on the subject of this vaccine are well known [17,20]. Societal suspicion, taboos about sex, prejudices about the association between infection and (at-risk) sex, or the fear of side effects in today's climate of vaccination controversies [19,28–30] — all these can become confused with the fear of injection or of the pain associated with vaccination, or even its cost for families without supplementary health insurance [15,17,18]. These factors are all part of the *emotional discourse* around vaccination, which guides decisions much more than *rational discourse* does [31,32]. To counter emotions, information should be repeated and brought closer to these girls' preoccupations. The young people questioned proposed that more systematic, more regular information be organized, in appropriate settings, such as schools or vaccination centers. Its pedagogical content must focus on this virus, the disease pathogenesis, and the possible methods of prevention. The information should allow girls to develop their own opinion in middle school, according to their own rhythms, and to feel more concerned by the issue. It appears useful to integrate the discourse about HPV vaccination with the general discourse about sexual health – prevention of sexually transmitted disease as well as discourse about sexual health [33]. This would make it possible to move away from talking about the prevention of a hypothetical and distant cancer that does not correspond at all to the concerns of adolescents, which are much more short-term, set as they are in the immediate or near future.

This raises the question of parental involvement in the vaccination decision. Parental fears have been identified as one of the principal obstacles to vaccination [14,27,28,34]. The vaccine is recommended at an age where adolescents are becoming increasingly involved in the medical decisions that concern them [17,26]. It is noteworthy that HPV vaccination for girls in France younger than 18 years requires parental approval, although the girls can make a substantial number of the decisions about their sexual health without parental accord: contraception and morning-after pills, elective abortions, and screening and treatment of sexually transmitted infections. Moreover, these types of care can be performed for minors both anonymously and free of charge. We propose that vaccination against HPV be added to the list of potential rights for young girls guaranteed by French law. The laws about decisions and access to care related to adolescent sexual health differ from country to country and within subdivisions of countries; they are often more restrictive than in France [35]. Many countries are more permissive about minor girls making the decision about HPV vaccination, although agreement with parents is most often sought. We hope that legislative progress will allow young girls to be more deeply involved in these decisions. If girls are well-informed and participate actively in the decision, it becomes possible to envision individual awareness that will progressively lead to protection of the entire community.

5. Strengths and limitations of the study

We questioned more than 100 French adolescent girls about vaccination against HPV. This was a clinical population, seeing doctors regularly, and possibly better informed about this vaccination. Nonetheless, these French teenage girls with a chronic disease did not have optimal vaccination coverage, although their rate of complete vaccination is higher than in the general population [36]. Finally, even though the representativeness of the general population is not an aspect defining rigor in qualitative research, our sample is representative of the different theoretical positions, with variability of age, vaccination status, and social and demographic backgrounds.

6. Conclusion

Teenage girls are more sensitive to the emotional discourse that surrounds HPV vaccination than to rational knowledge about it. The requirement for parental authorization to be vaccinated reinforces the girls' lack of investment. Vaccination programs should integrate the HPV vaccine into sexual health education and send a strong signal by offering vaccination that is anonymous and free of charge, as already possible in France for requests for other sexual health care.

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Competing interest

All authors have completed the ICMJE uniform disclosure form at www.icmje.org/coi_disclosure.pdf and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years; no other relationships or activities that could appear to have influenced the submitted work.

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Authors' Contributions

Conceived and designed the experiments: HL, SR, AT, RDT, CF, AC, MD, MRM, JL.

Conducted the literature review: SS, NI.

Performed the experiments: HL, SS, NI, SR, AT, RDT, CF, AC, MD.

Wrote the paper: HL, SS, MRM, JL (the entire paper), SR, AT, RDT, CF, AC, MD (results and discussion), NI (introduction and discussion).

Final Approval: HL, SS, NI, SR, AT, RDT, CF, AC, MD, MRM, and JL.

All authors had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

The manuscript is an honest, accurate, and transparent account of the study being reported; no important aspects of the study have been omitted; and any discrepancies from the study as planned have been explained.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.vaccine.2019.02.020.

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