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A survey about the degree of information and awareness of adolescents regarding vaccination in a Province of Central Italy

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Key words: Adolescents, Vaccine Knowledge, Awareness, Vaccine literacy
Parole chiave: Adolescenti, Conoscenza dei vaccini, Consapevolezza, Alfabetizzazione vaccinale

Abstract

Background. *Understanding the level of awareness in adolescents on the value of vaccination is kay to developing a proper culture of prevention to counter vaccine hesitancy and the decrease in vaccination coverages.*
Study design. *The aim of the survey was to evaluate awareness, attitudes, opinions, skills and knowledge about vaccines in a group of Italian adolescents through a paper-and-pencil questionnaire.*
Methods. *The questionnaire was administered to adolescents who had appointments in two vaccination centers of the Public Health Authority of Latina (Latium, Italy), between August 2018 and January 2019.*
Results. *In total, 391 forms were completed by teenagers (median age 16 years, 52% females), Results showed that 53% of participants were not aware of their vaccination status. Knowledge, assessed through questions about vaccines and preventable diseases, was generally poor. However, 89% of adolescents had a positive opinion about vaccinations. Spontaneous searches for vaccine information was low (28.7% had looked for information), despite the medium to high interest expressed. The participants usually sought information on vaccines on generic websites (52.8%) compared to getting information from paediatricians (20.4%) or other physicians (3.7%). However, participants recognized paediatricians/GPs (47%) and schools (46.2%) as the most reliable sources of information.*
Conclusions. *Findings are in agreement with previous published data and can be useful to school and health educators in order to teach adolescents about the value of prevention, providing them with the support necessary to improve their abilities and knowledge.*

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Introduction

Immunization programs are among the most effective and safe public health interventions for the primary prevention of communicable diseases. The success of vaccine programs that have significantly reduced the incidence of potentially fatal diseases has led to a consequent decrease in the perception of the severity of communicable diseases, generating complacency and "vaccine hesitancy". This phenomenon is recognised by WHO as one of the main causes of failing to achieve vaccination coverages (1, 2).

While vaccination status in children depends exclusively on their parents, teenagers have the opportunity to make decisions themselves. Adolescence is a critical moment for the administration of different vaccines such as Diphtheria-Tetanus-Pertussis-Polio (DTPa-IPV), Measles-Mumps-Rubella (MMR), Varicella, Human Papillomavirus (HPV), Meningococcus (3). Several studies have been conducted to assess the knowledge and interest of adolescents about vaccinations, and the sources that they use and prefer to search for information (4, 5). In general, adolescents understand the importance of vaccinations and have a positive opinion of them, but they have little awareness of their own vaccination status and there is a lack of knowledge regarding disease risk among parents and adolescents, and this can contribute to low vaccine uptake (6). For these reasons, understanding the levels of knowledge and awareness about vaccinations in adolescents, as well as their abilities to collect, comprehend, and use health information including vaccination (i.e. their health literacy and 'vaccine literacy' skills), it is important to counter vaccine hesitancy and the decrease in vaccination coverages (7, 8).

Thus, the aim of the current survey was to evaluate the awareness, attitudes, opinions, knowledge and the information-seeking skills about vaccination of a group of Italian adolescents, and to assess the association of these variables with socio-demographic factors.

Methods

1. Study population

The survey was coordinated and carried out by two Vaccination Centres (Latina and Aprilia) from the Public Health Authority of Latina (Italy) among adolescents aged 14-18 years who were vaccinated between August 2018 and January 2019 at these centres (total population of the Public Health Unit of Latina n = 563,271 – population 14-18 years of age n = 26,495, as of 1st January, 2019).

2. Data collection/questionnaire

Data were collected through an anonymous, self-administered questionnaire, which assessed the level of participants' awareness and knowledge on the vaccinations that they were about to receive and those that they would receive in the near future.

The questionnaire was conceived by the Public Health Department on the basis of surveys previously published (2, 5, 8), and it was validated through a process of internal face validity by the staff of the Vaccination Centres. The form was available in the waiting rooms of the two Vaccination Centres. Adolescents were asked to complete the form before being vaccinated and leave it in a box, but participation was entirely voluntary. Participants were instructed to complete the test independently and honestly, without consulting their vaccine documents/certificates, or other sources, or asking their parents or other accompanying persons for information.

The questionnaire consisted of 14 closed (precoded) and one open questions (Table 1), as well as socio-demographic status (age, sex, number of siblings, type of school attended, and parents' nationality and education). In

particular, the questions were about:

- awareness of the respondents on their own vaccination status (main endpoint); we assessed awareness of vaccination history by asking participants to report whether they had been vaccinated against specific diseases (responses: I am vaccinated, I am not vaccinated, I don't know/can't remember), and which vaccination they were due to receive the day of the visit;
- their motivation and capability to obtain and understand information about vaccines from their parents or other sources (teachers, paediatricians or other doctors, vaccination centre, web, institutional sites, social networks, books, TV/radio); we consider that these capabilities correspond to the so called 'vaccine health literacy' or 'vaccine literacy' (8);
- opinion and knowledge about vaccinations recommended in adolescence and vaccines in general. The knowledge on vaccinations and some specific aspects of preventable diseases was assessed asking answers (true, false, don't know) to 14 statements about vaccines and preventable diseases, and giving a mean score, from 0 to 14, adding up the correct replies (correct reply=1; wrong reply, don't know=0).

The study was performed following the Declaration of Helsinki as revised in 2013.

3. Statistical analysis

Collected data were entered in a Microsoft Excel worksheet and analysed in terms of absolute numbers, frequencies and mean ± standard deviations, according to the variable type (Table 1).

Internal consistency was assessed through Cronbach's alpha, calculated from the replies about the awareness of vaccines received and on the knowledge about vaccination. The associations between the demographic variables and those related to the awareness, abilities, and knowledge about vaccines were evaluated using the chi-squared and the Kruskal-Wallis tests for nominal and ordinal/continuous variables, respectively (Statistical software: MedCalc version 18.2.1) (9).

Considering the expected frequency of the main endpoint (level of awareness) equal to 50%, with an error of 5%, the sample size calculated was equal to 374 valid questionnaires to be collected to obtain representative data from the adolescent population.

Results

The Cronbach's coefficient value, calculated from the replies about awareness of vaccines received and knowledge about vaccination, was acceptable (alpha = 0.8772 and 0.7601, respectively).

1. Characteristics of the study population

In total, 391 questionnaires – of which 378 evaluable by sex - were collected during the period August 2018 - January 2019; 291 (74.4%) from the Latina vaccination center and 100 (25.6%) from the Aprilia vaccination centre.

The socio-demographic information is summarized in table 2.

The median age of the sample was 16 years (Mean age 15.7 ± 0.9). The number of females and males were similar, with a small majority of girls. About 64% of them attended high school, most had younger (38%) or older (38%) siblings. The majority had both parents with Italian nationality and a diploma as a degree.

Table 3 reports the association of socio-demographic variables with awareness, knowledge about vaccines and replies to some vaccine literacy questions.

2. Awareness of their own vaccination status

The first question assessed the participants' awareness of which vaccination they were due to receive that day. About 57% of males and the half of females were not aware of which vaccine they would receive. Even though

Table 1 - Questions, variables and domains included in the questionnaire administered to adolescents visiting the vaccination centres in Latina and Aprilia

	Question	**Variable**	**Measure**	**Domain**	**Analysis**
1	Which vaccination did you come here for, today?	Nominal	Don't' know For the following; …	Awareness,	Chi-squared test
2	Have you conversed with your parents in the last few days about the today's vaccination?	Nominal	Yes No	Vaccine Health Literacy (*)	Chi-squared test
3	Have you conversed with your doctor about the today's vaccination?	Nominal	Yes No	Vaccine Health Literacy	Chi-squared test
4	Have you been vaccinated against one of the following diseases?	List of recommended vaccinations	Multiple choice: • DTP • Polio • MMR • HPV • Meningo ACWY • Meningo B	Awareness	Descriptive
5	What do you think the main function of vaccines is?	List of possible replies	Multiple choice: • prevent disease • treat disease • prevent severe disease • don't know	Opinion/ knowledge	Descriptive
6	Do you think it's important to get vaccinated?	List of possible replies	Multiple choice: • Yes, all individuals should receive all vaccines • Yes, only against important diseases • No, vaccines are useless • No, vaccines are unsafe • Don't know	Opinion	Descriptive
7	How important are the following vaccinations for you?	Ordinal	5-point Likert scale List of recommended vaccines (see question # 4)	Opinion	Descriptive
8	Have you ever talked about vaccinations with your doctor?	Nominal	• Yes • No	Vaccine Health Literacy	Chi-squared test
9	Did they ever talk to you at school about vaccines?	Nominal	• Yes • No/Just mentioned	Vaccine Health Literacy	Chi-squared test

10	Have you ever looked for information about vaccines?	Nominal	• Yes • No	Vaccine Health Literacy	Chi-squared test
11	If so, where did you look for?	List of possible replies	**Multiple choice:** • Different information sources	Vaccine Health Literacy	Descriptive
12	How much you are interested in information about vaccines	List of topics about recommended vaccinations	• Multiple choice: • List of recommended vaccines (see question # 4)	Vaccine Health Literacy	Descriptive
13	From whom would you like to receive information about vaccinations?	List of possible sources	**Multiple choice:** Different information sources	Vaccine Health Literacy	Descriptive
14	Reply to 14 statements about vaccines:	Continuous (Score 0-14)	**True/False /Don't know** • If vaccination is stopped rare infectious diseases could return • Meningitis is transmitted by respiratory route • You can die from meningitis • No one has died of measles in decades • There is no vaccine for meningitis • Vaccines can cause autism • Doing a healthy diet and sports does not need to be vaccinated • Tetanus is a dangerous infection that affects muscles • Tetanus can be taken through wounds • HPV infection is transmitted sexually • HPV infection is very rare • HPV infection can cause cervical cancer • Only girls can get HPV infection • Both boys and girls can be vaccinated for HPV	Knowledge	Kruskal-Wallis test
15	Do you have any doubts you would like to be clarified about vaccinations?	Open reply	**Comment/question**	Knowledge, Vaccine Health Literacy	Descriptive

(*) Vaccine Health Literacy = the combination of motivation, knowledge and capability to access, understand and use information about vaccines (8).

Table 2 - Socio-demographic characteristics of the sample

	N°	%
Gender		
Female mean age 15,8 ±0.9	196	51.8%
Male mean age 15,6 ±1.0	182	48.2%
Type of school		
Middle school	5	1.3%
High school	251	64.4%
Technical Institute	76	19.5%
Professional Institute	54	13.8%
Others	5	1.0%
Siblings		
No	62	15.9%
Yes, younger	149	38.3%
Yes, older	149	38.3%
Yes, younger and older	29	7.5%
Parents' nationality		
Both Italian parents	338	92.3%
One Italian and one foreign parent	9	2.5%
Both foreign parent	19	5.2%
Parents' education		
Both parents with middle school diploma or lower title	75	19.2%
One parent with high school diploma (and the other one with diploma or lower qualification)	211	54.1%
One or more parents with a university degree	104	26.6%

the rest of respondents answered "for the following vaccination…" it was not possible to confirm if the vaccination reported was accurate. They also often indicated vague and imprecise vaccinations (eg: tetravalent, recall, etc.) so, possibly, the percentage is overestimated and some adolescents incorrectly reported that they knew which vaccination they were due to receive. About 63% of participants had spoken to their parents regarding vaccinations they were due to receive and very few had talked to their doctor (10.4%), although females had significantly conversed more.

Regarding awareness of vaccination status, we found no association between groups with different number of siblings, parents' education and type of school. On the contrary, differences were observed by the age groups (Fig. 1 - P= 0.005, chi-squared test), but they were not significantly related to the increase by age (P= 0.547, chi-squared test for trend), showing that there was no increase in vaccination awareness with higher age.

In particular, regarding specific vaccinations, many participants were unaware of whether they had received Meningococcal ACWY (47.1%) and Meningococcal B (43.7%) vaccines. However, the majority were aware of their immunization status against Measles-Mumps-Rubella (MMR) (74.2%), Diphtheria-Tetanus-Pertussis (dTaP) (73.9%) and HPV (73.7%).

3. Opinion about vaccinations

As shown in Table 3, only 20.3% of the teenagers had spoken in detail to their doctor about vaccinations, and only 23.6% had discussed it in depth at school.

Most (n=315, 82.5%) adolescents

Table 3 - Association of the socio-demographic variables with awareness, knowledge about vaccines and replies to some vaccine literacy questions: chi-squared (χ^2) and Kruskal-Wallis (KW) test

Question	Variable	Total (n=378)		Males (n=182)		Females (n=196)		Males / Females	Sibling Y/N	Mother's education	Father's education	Type of school attended	Higher Age
		n	%	n	%	n	%						
Which vaccination did you come here for today?	1= Don't know	201	*53,2*	104	*57,1*	97	*49,5*	P = 0.137 χ^2	P = 0.056 χ^2	P = 0.437 χ^2	P = 0.124 χ^2	P = 0.224 χ^2	P = **0.005** (for trend P = 0.547) χ^2
	2= For the following…	177	*46,8*	78	*42,9*	99	*50,5*						
Have you conversed with your parents in the last few days about the today's vaccination	Yes	235	*63,3*	105	*58,7*	130	*67,7*	P = 0.071 χ^2	P = 0.629 χ^2	P = 0.409 χ^2	P = 0.707 χ^2	P = 0.423 χ^2	P = 0.426 χ^2
	No	136	*36,7*	74	*41,3*	62	*32,3*						
Have you conversed with your doctor about the today's vaccination	Yes	38	*10.4*	10	*5,7*	28	*14,6*	**P = 0.006** χ^2	P = 0.147 χ^2	P = 0.324 χ^2	P = 0.115 χ^2	P = 0.946 χ^2	P = 0.368 χ^2
	No	328	*89,6*	164	*94,3*	164	*85,4*						
Have you ever talked about vaccinations with your doctor?	Yes, in detail	74	*20,3*	37	*21,1*	37	*19,5*	P = 0.692 χ^2	P = 0.156 χ^2	P = 0.775 χ^2	P = 0.077 χ^2	P = 0.394 χ^2	P = 0.095 χ^2
	No/ A little	291	*79,7*	138	*78.9*	153	*80,5*						
Did they ever talk to you at school about vaccines?	Yes, in detail	86	*23,6*	40	*23,0*	46	*24,1*	P = 0.806 χ^2	P = 0.416 χ^2	P = 0.282 χ^2	P = 0.951 χ^2	P = 0.758 χ^2	P = **0.010** (for trend P = **0.004**) χ^{22}
	No/ A little	279	*76,4*	134	*77.0*	145	*75,9*						
Have you ever looked for information about vaccines?	Yes	104	*28,6*	46	*26,7*	58	*30,2*	P = 0.466 χ^2	P = 0.558 χ^2	P = 0.282 χ^2	P = 0.951 χ^2	P = 0.248 χ^2	P = **0.018** (for trend P = **0.006**) χ^2
	No	260	*71,4*	126	*73,3*	134	*69,8*						
Knowledge about vaccines	Score 0-14	Mean=6.51 ±3.40		Mean=6.35 ±3.57		Mean=6.60 ±3.20		P = 0.513 KW	P = 0.637 KW	P = **0.026** KW	P = **0.016** KW	P = 0.251 KW	P = 0.350 KW

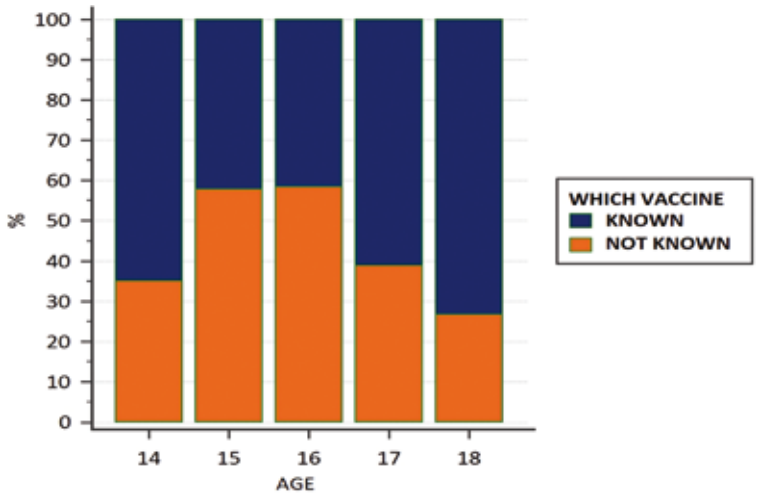

Fig. 1 - Participants' awareness (%) of which vaccine they were due to receive during the visit to the clinic, according to their age (years)

answered correctly that the main purpose of vaccines is to prevent infectious diseases. Only 2.6% believed that vaccines are used to treat diseases and none believed that they are dangerous; 343 (89%) of them believed that all individuals should receive recommended vaccines.

Vaccination against tetanus was indicated as the most important (63.5%), followed by HPV (57.9%). Vaccination for MMR was considered less important (51.0%) than the others (Table 4).

4. Adolescents' major sources of knowledge on vaccinations

We assessed the information used and preferred by adolescents by asking participants whether they had ever looked for information on vaccines and where. Most (n=260 or 71.4%) had never looked for information on vaccines. For those who did, the primary source was the Internet, on sites such as Wikipedia or generic search engines (53.8%), followed by conversations with friends, acquaintances, or relatives (41.7%), institutional websites (Ministry of Health, Italian Medicines Agency - AIFA, Nat. Institute of Health-ISS, etc) (21.3%), and social networks (13.9%). Only 7.4% of adolescents had turned to the vaccination service to request information on vaccines and 47% would have liked to receive more information from their paediatrician and / or primary care physician, and to attend meetings with experts at school.

Table 4 - Adolescents' opinions about the importance of six vaccinations

Vaccines	Very important		Important enough		Not very important		Not important		Don't know	
	N	%	N	%	N	%	N	%	N	%
HPV	213	57.9%	84	22.8%	9	2.5%	2	0.5%	60	16.3%
MMR	190	51.0%	138	37.0%	10	2.8%	0	0.0%	34	9.2%
Meningitis B	209	56.3%	113	30.5%	7	1.9%	0	0.0%	42	11.3%
Meningitis ACWY	209	56.6%	103	28.0%	5	1.4%	0	0.0%	52	14.0%
Tetanus	235	63.5%	97	26.2%	3	0.8%	0	0.0%	35	9.5%
Polio	198	53.4%	100	27.0%	4	1.1%	0	0.0%	69	18.5%

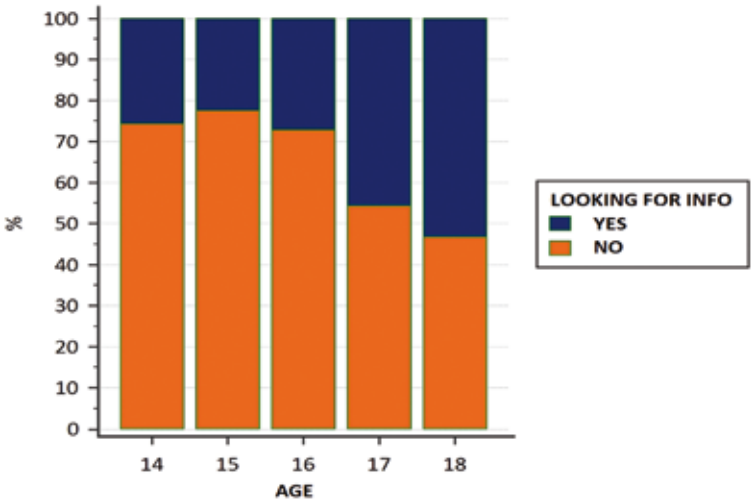

Fig. 2 - Participants' motivation (%) in looking for information about vaccine (by age)

5. Interest about vaccines

The interest in vaccinations recommended for adolescents by the National Vaccine Prevention Plan (PNPV) 2017/2019 was high: many of the adolescents (n=272, 70%) believed that it is very or fairly important to receive information, and this increased with increasing age (Fig. 2).

6. Knowledge and doubts about vaccination

We assessed participants' knowledge on vaccinations and some specific aspects of preventable diseases asking answers (true, false, don't know) to 14 statements about vaccination: adding up the correct replies a score was given, from 0 to 14: the mean score was 6.51 (±3.40), with no significant differences between genders (Table 3).

In detail, most participants did not know how diseases like meningitis were transmitted (n=271, 76%) or the serious consequences of HPV infection (n=220, 62%). However, more than 88% were aware of how important is to be vaccinated in order to prevent eradicated diseases from re-emerging.

Some participants (n= 132, 37%) did not know how to respond regarding whether or not there was an association between vaccines and autism spectrum disorders, while 11.8% (n= 42) thought that vaccines may cause autism; 72.8% (n= 259) of adolescents knew that tetanus can be contracted through injuries, but 27.2% (n= 96) did not know that this disease can be extremely severe and that it affects the muscles.

About seventy-six percent of them (n=271) were not aware of how meningitis is transmitted, but n= 272 (75%) knew that this disease can be fatal and that a vaccine is available. Sixty-two percent (n=220) of the respondents did not know that the HPV virus causes cervical cancer: a low general knowledge about the transmission modalities emerged, as well as about the vaccines. About 28% did not know that measles can still be a fatal disease.

Finally, adolescents were asked if they had any doubts about vaccinations through an open question with which they could express themselves. Only 13.5% expressed doubts about vaccinations and many were concerned by the adverse effects of vaccines

(27%). This shows a discrepancy between the expressed and the real interest.

Discussion

Vaccination is an effective primary prevention intervention, especially in children and adolescents. Nevertheless, in recent years, misinformation and the spread of fake news about adverse effects of vaccines has led to a high rate of "vaccine hesitancy". This phenomenon consists in the indecision or refusal of vaccines, even when these are actively offered by health services. Vaccine hesitancy is recognized as being a main cause of the decrease in vaccination coverage (1, 2).

While in childhood vaccination coverage depends exclusively on parents' decisions, adolescents have the chance to choose for themselves. However, they need to be adequately provided with information that is useful to understand the value of immunization and to consciously participate in decisions, thus increasing their "Vaccine health literacy" (i.e., a person's knowledge, motivation, and skills to find, understand and use information to as about vaccination - 8).

1. Main findings and comparison to other research

Regarding the main objective of the study, our survey has shown that participants' awareness about vaccination status and which vaccination they were due to receive was quite low (<50%): moreover, it was not possible to confirm if among respondents providing a positive reply the vaccination reported was accurate. They also often indicated vague and imprecise vaccinations so, possibly, the participants' awareness is even overestimated.

Despite their low awareness, participants had a positive opinion about vaccines: 89% of them believed that all individuals should receive recommended vaccines, and no one considered them dangerous. These data confirm the results of another survey conducted in Italy (10) where 95% of adolescents thought that vaccines are useful for protecting against important infectious diseases, although 10.4% considered them unsafe, while a survey of the Italian Society of Paediatrics (SIP) (11) reported that the majority of adolescents (89.3%) agreed that everyone should receive the recommended vaccines. These findings suggest that Italian adolescents seem to have confidence in vaccinations compared to data from other countries, such as the United States where almost a third of adolescents (31%) considered vaccines unsafe (12).

Concerning socio-demographic variables, our results do not show significant sex differences in vaccine knowledge and awareness, although higher in females. Further, responses did not vary according to other demographic variables such as type of school attended, presence of siblings, and parents' education. However, some age differences were found; younger adolescents were significantly less open to looking for information on vaccines and appeared to have less knowledge about vaccinations, which is an expected finding.

Most of the participants had good general vaccine knowledge as 82.5% knew that the main function of vaccines is to prevent infectious diseases; these data also confirm the observations in the SIP study (11). However, adding up the correct replies to the 14 statements about vaccination the mean score was quite low (mean score = 6,50, on a maximum of 14): indeed, despite the positive opinion and good general knowledge on vaccination, specific knowledge was limited, especially regarding the HPV and meningococcal vaccines, for which teenagers are the primary target. For example, 62.1% of the participants did not know that HPV can cause cervical cancer; more than half were unaware that the infection can also

affect males and that vaccination is also recommended for them. Similar findings were reported from a study in India (13), which showed that only a small percentage (about 32%) of adolescents (both male and female) were aware of the association between HPV infection and cancer.

In addition, about three quarters (76%) of the participants did not know that meningitis is transmitted by the respiratory route, similar to another study conducted in Italy (14) in which only 30.3% knew how meningitis is transmitted. Regarding the awareness of the availability of a vaccine for meningitis, our results were comparable with those of two other studies (14, 15) where 71.6% and 76% of adolescents, respectively, knew that meningitis can be prevented by the vaccination. Our study showed that 75.4% of teenagers know that meningitis can be fatal, which suggest that they correctly perceive the seriousness of the disease and, therefore, the usefulness of immunization.

Regarding the interest in information about vaccines, only 28.7% of the interviewees had looked for information independently, similarly to the SIP study (11) (where 25.4% had searched for information on their own), while a large proportion group (>70%) expressed a medium-high interest in receiving more information. Our survey also showed that the internet is one of the most common information sources for adolescents (52.8%), while paediatricians (20.4%) or other trusted doctors (3.7%) were less common. These figures are in line with current trends: adolescents have easy and frequent access to the internet. However, these data differ from other studies in which high percentages of adolescents, 43.6%, 81% and 53.6% (10, 15, 16) respectively, frequently contacted their own or other doctors for information. Indeed, our participants recognized their paediatrician and general practitioner (47%) or the school (46.2%) as the most reliable sources of information, but they rarely consulted them. This represents a discrepancy between the expressed and the real interest, but could be due to practical reasons, such as access difficulties. Two studies carried out in an Italian macro-area (2, 17) on parents' beliefs and vaccine hesitancy showed that the majority of pro-vaccine parents considered paediatricians (90%) (2) and other trusted doctors (40,6%) (17) a very reliable source of information on vaccinations.

Finally, although the interest on the topic of vaccinations was medium to high, many respondents answered "I don't know" to the survey questions and few interviewees (13.5%) expressed doubts about vaccines, most of which were related to side effects.

2. Limitations and strengths of the study

As the survey was anonymous and not linked to clinical vaccine records from the Public Health Units, we were not able to verify the accuracy of some answers, such as which vaccine the participant was due to receive. In addition, it was not possible to evaluate the number of adolescents who had an appointment at the vaccination centre during the study period and, thus we could not assess the participation rate or evaluate potential selection bias. Moreover, although the survey instructions specifically asked participants to complete the form independently, without consulting the internet or their parents, it is possible that the adolescents could have used help or may have completed the forms after their vaccination appointment. Finally, our survey was conducted before the COVID-19 pandemic. The 'infodemic' generated by this emergency is likely to produce a psychological impact among Italian adolescents (18) and influence their knowledge and attitudes about prevention of infectious diseases and the value of immunization. Future studies will be able to assess this risk and the current results help to provide a picture of their pre-pandemic vaccination awareness and knowledge.

Despite the study limitations, our results and those of other studies conducted in Italy and other countries may be relevant for planning health education interventions aimed to increase vaccine literacy among adolescents. Our survey highlights areas where knowledge and awareness need to be increased and could provide effective guides to schools and health educators in terms of both providing information, but also helping and stimulating them to look for, understand, and use it properly. Healthcare professionals involved in this process have a critical role and must be at the forefront because adolescents have shown the willingness and need to be adequately informed by qualified persons, who could be an important filter between them and the internet, which may have inaccurate or alarmist information. It is essential to stimulate adolescents and develop the motivation and skills to correctly interpret health information.

3. Future research

Future research is needed to explore which vaccine-related topics are the most interesting to adolescents and identify effective communication strategies. Improving knowledge about vaccination and vaccine literacy skills of teenagers should focus on providing new generations with important tools for understanding the value of communicable disease prevention and for managing their own health.

Conclusions

Adolescents who have appointments at vaccination centres are often not aware of their vaccination history or which vaccine they are due to receive. Yet, they have positive opinions on vaccination and believe that vaccines are useful and safe. No significant differences were found according to socio-demographic characteristics. Teenagers seek online information on vaccines on generic websites, although they believe that receiving information from the vaccination service or the general practitioner or paediatrician is more reliable, although more difficult to obtain. However, spontaneous information searches were rare despite the medium to high interest expressed. Adolescents would like to receive more information from teachers or from external experts.

Authors' contribution: G. Fadda drafted the study protocol and the manuscript and collected the result; L.R. Biasio performed the statistical analysis and reviewed the manuscript; T. Mariani contributed to the preparation of the questionnaire and to the study design; C. Giambi conceived and supervised the study. All authors discussed the results and contributed to the final manuscript.
The authors declare that they have no competing interests.

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Riassunto

Indagine sul grado d'informazione e consapevolezza degli adolescenti riguardo le vaccinazioni in una Provincia dell'Italia Centrale

Premessa. Comprendere il livello di consapevolezza degli adolescenti sul valore dei vaccini è importante per promuovere lo sviluppo di un'adeguata cultura della prevenzione, migliorare gli esiti di salute di tutta la popolazione e contrastare l'esitazione vaccinale e la riduzione delle coperture vaccinali.

Disegno dello studio. L'indagine mirava a valutare la consapevolezza, le attitudini, le opinioni, le competenze e le conoscenze sui vaccini di un gruppo di adolescenti italiani, attraverso la somministrazione di uno specifico questionario cartaceo.

Metodo. Il questionario è stato somministrato ad adolescenti che si recavano in due centri di vaccinazione dell'Unità Sanitaria Locale di Latina (Lazio), tra i mesi di agosto 2018 e gennaio 2019.

Risultati. Sono stati raccolti 391 questionari, compilati da adolescenti di età media 16 anni (52% femmine). I

risultati hanno mostrato che il 53% dei partecipanti non era a conoscenza del proprio stato vaccinale. Le conoscenze, valutate attraverso domande sui vaccini e sulle malattie prevenibili, erano in generale scarse. Tuttavia, l'89% degli adolescenti aveva un'opinione positiva sulle vaccinazioni. La ricerca spontanea di informazioni era scarsa (28.7% avevano cercato informazioni), nonostante l'elevato interesse espresso. In genere gli adolescenti cercavano informazioni sui vaccini su siti web generici (52.8%), mentre il pediatra (20.4%) o altro medico di fiducia (3.7%) hanno registrato percentuali inferiori. Tuttavia, i partecipanti riconoscevano il pediatra/medico curante (47%) o la scuola (46.2%) come fonte di informazione più affidabile.

Conclusioni. I risultati sono in accordo con precedenti dati pubblicati e possono essere utili alle scuole e agli educatori sanitari al fine di insegnare agli adolescenti il valore della prevenzione, fornendo loro il supporto necessario per migliorare le loro capacità e conoscenze.

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