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Parental vaccine hesitancy in Italy – Results from a national survey

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ABSTRACT

In Italy, in 2016, we conducted a cross-sectional survey to estimate vaccine hesitancy and investigate its determinants among parents of children aged 16–36 months.

Data on parental attitudes and beliefs about vaccinations were collected through a questionnaire administered online or self-administered at pediatricians' offices and nurseries. Parents were classified as pro-vaccine, vaccine-hesitant or anti-vaccine, according to self-reported tetanus and measles vaccination status of their child. Multivariable logistic regression was used to investigate factors associated with hesitancy.

A total of 3130 questionnaires were analysed: 83.7% of parents were pro-vaccine, 15.6% vaccine-hesitant and 0.7% anti-vaccine. Safety concerns are the main reported reason for refusing (38.1%) or interrupting (42.4%) vaccination. Anti-vaccine and hesitant parents are significantly more afraid than pro-vaccine parents of short-term (85.7 and 79.7% vs 60.4%) and long-term (95.2 and 72.3% vs 43.7%) vaccine adverse reactions. Most pro-vaccine and hesitant parents agree about the benefits of vaccinations. Family pediatricians are considered a reliable source of information by most pro-vaccine and hesitant parents (96.9 and 83.3% respectively), against 45% of anti-vaccine parents. The main factors associated with hesitancy were found to be: not having received from a paediatrician a recommendation to fully vaccinate their child [adjusted odds ratio (AOR): 3.21, 95% CI: 2.14–4.79], having received discordant opinions on vaccinations (AOR: 1.64, 95% CI: 1.11–2.43), having met parents of children who experienced serious adverse reactions (AOR: 1.49, 95% CI: 1.03–2.15), and mainly using non-traditional medical treatments (AOR: 2.05, 95% CI: 1.31–3.19).

Vaccine safety is perceived as a concern by all parents, although more so by hesitant and anti-vaccine parents. Similarly to pro-vaccine parents, hesitant parents consider vaccination an important prevention tool and trust their family pediatricians, suggesting that they could benefit from appropriate communication interventions. Training health professionals and providing homogenous information about vaccinations, in line with national recommendations, are crucial for responding to their concerns.

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1. Introduction

The World Health Organization (WHO) describes vaccine hesitancy as the “delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place and vaccines. It is influenced by factors such as complacency, convenience and confidence” (page 4163) [1]. This phenomenon is globally increasing in the general population [2–6].

Research has identified several factors associated with parental vaccine refusal and hesitancy [7–9]. In order to map these factors, the WHO SAGE Working Group classifies them under three categories: contextual (due to historical, socio-cultural, environmental, institutional, economic or political factors), individual and group (e.g. personal beliefs and attitudes about prevention or previous experiences with vaccinations), and vaccine/vaccination-specific (e.g. concerns about a new vaccine or formulation or about mode of administration or delivery) [1].

In 2013, staff from the WHO regional offices conducted interviews on reasons for vaccine hesitancy with immunization managers of thirteen countries, representing the six WHO Regions, confirming that causes of vaccine hesitancy varied in the different countries and also through-out the same country. This indicates a need to strengthen the capacity of countries to locally identify the relevant causal factors of vaccine hesitancy and to develop tailored strategies to address them [10].

In Italy, childhood vaccination coverage rates for various vaccine-preventable diseases have been decreasing since 2013. In 2016, the vaccination coverage rate for poliomyelitis in children at 24 months of age was below 95% [11]. This comes at a time when the WHO European Region is at risk for a poliomyelitis outbreak [12,13]. Moreover, in 2016, the vaccination coverage rate for measles in children at 24 months of age was only 87.3% [11] and a large measles epidemic occurred in Italy in 2017, with more than 4885 cases reported from January to December 2017 [14].

We carried out a cross-sectional survey to estimate the degree of parental vaccine hesitancy existing in Italy and investigate its determinants among parents of children aged 16–36 months.

2. Methods

2.1. Study population and data collection

The survey, coordinated by the Italian National Institute of Public Health (Istituto Superiore di Sanità), was conducted in the period December 2015 – June 2016, among parents of children aged 16–36 months. Data were collected: (i) through a Computer/Mobile Assisted Web Interviewing survey performed by an external research company that sampled participants from an online panel of Italian families, stratified to reflect the geographical distribution of the reference population by macro area (Northern, Central and Southern Italy); (ii) among parents attending pediatricians' offices and nurseries in five Italian Regions (Emilia-Romagna, Friuli Venezia Giulia, Marche, Piemonte, Puglia) who voluntarily completed a printed questionnaire.

The development of the questionnaire was informed by a literature review. It was tested within a group of 30 participants to evaluate clarity and appropriateness of questions, and modified accordingly. All participants were informed of the study aims and confidentiality of data. Online participants provided consent through an electronic form, whereas consent was considered implicit in parents who voluntarily and anonymously filled in a paper questionnaire.

2.2. Outcome and exposures

Self-reported vaccination status of children was assessed for tetanus, poliomyelitis, diphtheria, pertussis, *Haemophilus influenzae* type b (Hib), hepatitis B, measles, mumps, and rubella. To define vaccine hesitancy (outcome), measles and tetanus vaccinations were used as proxies of measles-mumps-rubella (MMR) and hexavalent vaccinations, respectively. Parents were classified as: (i) pro-vaccine if their child was vaccinated within the recommended age-intervals for both antigens, (ii) vaccine-hesitant if vaccination was delayed or interrupted for at least one of the two antigens, if their child was unvaccinated for one of the two antigens or if their child was not vaccinated at all but parents were still uncertain about the decision of vaccinating him/her, (iii) anti-vaccine if their child was unvaccinated for both antigens and parents were fully convinced of the decision not to vaccinate him/her. Parents were questioned about the main reason for refusal, delay or interruption. Parents reporting to have interrupted, delayed or refused vaccinations for the presence of one or more contraindications to vaccination were excluded.

The three groups were compared in terms of attitudes, beliefs and sources of information about vaccinations, and other variables (exposures). Attitudes and beliefs were explored through 26 questions on a 5-point agreement scale ranging from “Strongly agree” to “Strongly disagree” and including “I do not know”, regarding parental perceptions, the usefulness and benefits of vaccinations, safety of vaccinations, acceptance of combined and co-administered vaccines, perceptions about the vaccination information received, confidence and opinion on family pediatricians and public immunization services. The use of different vaccination information sources was assessed together with perceived reliability. The latter was measured on a 5-point scale ranging from “Very reliable” to “Not reliable” and including “I do not know”. Other aspects were evaluated: (i) whether parents had had any doubts about vaccinating their child; (ii) which advice on vaccinations was given to them by the family pediatrician, (iii) whether they had received discordant opinions on vaccinations from different health care professionals, (iv) whether they had met parents of children that had experienced serious reactions following vaccination, (v) which kind of treatments (traditional medicine/homeopathy/naturopathy or other types of non-traditional treatments) they principally used when their child was ill. Information on parental socio-demographic characteristics (nationality, geographical area of residence, educational level, employment status, employment in health care) were also collected. The complete questionnaire used for the survey is presented in [supplementary file 1](#).

2.3. Statistical analysis

A sample size of at least 2646 individuals was determined necessary to detect as statistically significant at least a 1.5-fold increase in the proportion of hesitant parents in the exposed group compared to unexposed group, with a sufficient statistical power ($\geq 80\%$). The sample size calculation was based on the following assumptions: α -level equal to 0.05; expected percentage of hesitant parents (outcome) in the unexposed group $\geq 10\%$; and ratio of unexposed to exposed subjects ≤ 6 .

We conducted a descriptive analysis of questionnaire responses using absolute frequencies with percentages (categorical variables) and means with standard deviation (SD) (continuous variables). The association between vaccine hesitancy and exposure variables was evaluated using the chi-square test. Exposure variables measured on a 5-point-scale were analysed excluding respondents who did not express an opinion and pooling them in two categories (e.g., “strongly agree or agree” and “disagree or strongly disagree”).

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