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Assessing determinants of the intention to accept a pertussis cocooning vaccination: A survey among Dutch parents

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ABSTRACT

Introduction: Pertussis cocooning is one of the strategies aiming to prevent the potential harm of pertussis in infants by vaccinating (among others) their parents. Several countries adopted this strategy, but uptake is a problem. Determinants of parental uptake are important in the design of an effective vaccination programme. Therefore, this study aims to assess parents' intention to accept a pertussis cocooning vaccination and its determinants.
Methods: A 98 item questionnaire was developed based on a theoretical framework, assessing parents' intention to accept a pertussis cocooning vaccination and its personal and psychosocial determinants. In addition, beliefs underlying parents' attitude towards pertussis cocooning vaccination were assessed. Both logistic and linear regression analysis were used to assess univariate and multivariate associations amongst study variables.
Results: Parents returned 282 questionnaires. The majority of the parents (78%) reported a positive intention to accept a pertussis cocooning vaccination. Attitude (OR 6.6, $p < .001$), anticipated negative affect in response to non acceptance (OR 1.65, $p < .001$), anticipated negative affect in response to acceptance (OR 0.55, p .040) and decisional uncertainty (OR 0.52, p .002) were significantly associated with intention. General vaccination beliefs (β 0.58, $p < .001$), moral norm (β 0.22, $p < .001$), perceived susceptibility of pertussis in children (β 0.10, p.004), and efficacy outcome expectations (β 0.15, p.011) were significant correlates of attitude towards pertussis cocooning vaccination.
Conclusion: The parental intention to accept a pertussis cocooning vaccination in this study is rather high. Targeting the identified determinants of parents' acceptance in a pertussis cocooning vaccination programme is crucial to secure that intention is translated into actual vaccination uptake.

1. Introduction

Despite longstanding vaccination programmes with high coverage, a resurgence of pertussis has been reported in the last decades [1,2], causing an increased risk of pertussis infection among young infants, who are too young to be (fully) protected by vaccination. For them, pertussis potentially runs a detrimental clinical course putting them at great risk of severe complications (e.g. apnea, convulsions, death) [3–5].

In addition to the regular child immunisation programmes, several strategies have been designed in high income countries to protect vulnerable infants from pertussis, such as maternal vaccination during pregnancy and cocooning [6–8]. In pertussis cocooning, pertussis vaccination is offered to individuals surrounding an infant aiming to prevent transmission to the baby. Parents are an important target group in this strategy [9]. Several models based on transmission rates suggest that this strategy has the

Abbreviations: CWC, Child Welfare Centre; NIP, National Immunization Program; RAA, Reasoned Action Approach; TPB, Theory of Planned Behaviour; TRA, Theory of Reasoned Action.

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potential to decrease the disease burden of pertussis in new-borns [10–12].

So far, introduction of pertussis cocooning has led to a problematic uptake in various countries [13–15]. Insight in parents' possible barriers and facilitators of acceptance is crucial, since interventions carefully considering these determinants within a coherent theoretical base assure optimal acceptance [16–19]. Therefore, the aim of this study is to assess parents' intention to accept a pertussis cocooning vaccination and its determinants.

2. Methods

2.1. Study design and population

We performed a cross-sectional questionnaire study among parents of newborns less than 2 months of age in the Netherlands. This specific group would also be the target group of a future parental pertussis cocooning vaccination programme.

2.2. Questionnaire development

A 98-item Dutch questionnaire was developed based on the results of a literature review and our previous qualitative study [20–27]. In the qualitative study we performed 13 focus groups and 6 individual interviews to explore the determinants of pertussis cocooning vaccination acceptance in both parents and various groups of healthcare workers. Upon evaluation of the results of this previous study in relation to the psychosocial literature on this topic, we noted similarities with the Reasoned Action Approach (RAA) [27,28]. The RAA argues that behaviour (e.g., vaccine acceptance) is determined by the intention to perform this behaviour. Intention in turn is determined by the attitude towards the behaviour (e.g., how does a person feel about accepting a vaccination), the perceived social norm towards the behaviour (e.g., how does a person think important others feel about accepting a vaccination), and the control people perceive to have over the behaviour (e.g., does a person think he is able to get vaccinated and does he think he is the one who has the autonomy to decide). In addition to the psychosocial determinants of the RAA, our qualitative study showed the importance of anticipated negative affect (e.g., does a person foresee any negative feelings as a result of the acceptance or non-acceptance of the vaccination?) and decisional uncertainty (e.g., does a person find it easy to decide whether to accept a vaccination or not?). We therefore added these psychosocial determinants to the potential determinants of intention in the theoretical framework for this study. Furthermore, various factors came forward from both the previous study and literature that seemed to influence parental attitude. In the RAA these factors are called attitudinal beliefs and we added them to the theoretical framework as potential determinants of attitude. Fig. 1 shows the final theoretical framework on which the questionnaire was based.

2.3. Variables

The primary outcome measure in the questionnaire was parents' intention to accept a pertussis vaccination if offered in the context of a cocooning strategy (Fig. 1). Furthermore, we measured both personal and psychosocial determinants that potentially influence the parental intention to accept vaccination as well as potential determinants of attitude. Fig. 1 shows an overview of the measures within psychosocial determinants of intention and the determinants of attitude. Personal determinants of intention included personal data (age, gender, education, income, etc.), vaccination data (own vaccination status within the National Immunisation Programme (NIP), etc.), and pertussis experience (experience with adults with pertussis, etc.). They were measured using 16 multiple-choice items, adapted to the Netherlands serosurveillance project PIENTER 2 (National institute for Public Health and the Environment, RIVM website accessed September 2012).

The primary outcome measure (intention), the psychosocial determinants of intention, and the determinants of attitude were measured with 7-point Likert-scales. Items were combined based on content and when internal consistency proved sufficient (Cronbach's Alpha $\alpha > 0.70$ or Pearson correlation $r > 0.60$). For each participant these items were then merged into one single measure by calculating the average score, but only if the participant answered at least 60% of the items within the measure.

2.4. Data collection

In November 2012, we asked the medical advisors of the five NIP coordination regions in the Netherlands to invite organisations in their region that carry out child welfare services to participate in the study. Eight organisations that were dispersed over three of the five coordination regions cooperated. In total, these organisations received 900 sets of questionnaires for dissemination among their Child Welfare Centres (CWC's) in December 2012. These CWC's asked their personnel to further distribute them among the target group. In the research period, most CWC's handed the questionnaires to all parents during their first well-visit at the centre, four weeks post partum. One CWC arranged for the parents to receive the questionnaires in the first week postpartum, through health care workers visiting at home for the infants' newborn screening. With the questionnaire all parents received a leaflet with information regarding the purpose of the study, and a short introduction to the pertussis cocooning strategy comparable to regular public health information provided in the NIP. In the letter it was also made clear that completing the questionnaire was voluntary, had no consequences regarding the care of the CWC and consent was implied by questionnaire completion. Parents could opt for an online (Limesurvey) or a paper questionnaire. Data was processed in SPSS for MS Windows (version 20). All finished online questionnaires had no missing items, as this was a requirement for completion. None of the returned paper questionnaires were excluded. Uncompleted items in the questionnaires were entered as 'missing'.

2.5. Data analysis

First, descriptive analyses on intention, determinants of intention, and determinants of attitude were performed (frequencies). Those measures for which more than 90% of the respondents filled in the same answering option were not included in further analysis, because of low variability. Since intention showed a non-normal distribution (skewness −1.43, SE 0.15, kurtosis 1.66, SE 0.29), the intention measure was dichotomized ($\geqslant$5.0 positive intention, <5.0 negative intention). Univariate and multivariate logistic regression analysis were used to assess the association between intention and its personal and psychosocial determinants. The Nagelkerke index was chosen to express a pseudo R^2, in order to approximate the explained variance of the multivariate logistic model.

To assess the contribution of the attitudinal beliefs in explaining attitude, a univariate and multivariate linear regression analysis was used. For the multivariate linear model the R^2 was used to express the explained variance. Those determinants that showed a significant bivariate association ($p < 0.3$) with the outcome variable (intention or attitude) in the univariate analyses were entered simultaneously in the multivariate model to assess their unique contribution to the explanation of the outcome variable. A final multivariate regression model was built by backwards eliminating