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The intention to get vaccinated against influenza and actual vaccination uptake of Dutch healthcare personnel

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ABSTRACT

Health Authorities recommend annual vaccination of healthcare personnel (HCP) against influenza to protect vulnerable patients. Nevertheless, vaccination rates have been low among European HCP. Here we report on a longitudinal survey study to identify social cognitive predictors of the motivation to obtain influenza vaccination, and to test whether intention is a good predictor of actual vaccination behaviour. Dutch HCP ($N = 1370$) were invited to participate in a survey (baseline). To link intention to behaviour, participants who completed the first survey ($N = 556$) were sent a second survey after vaccinations were offered (follow-up). Multinominal regression analysis showed that HCP with a positive attitude and a higher frequency of past vaccinations were more likely to have a high intention to get vaccinated. A negative attitude, high feelings of autonomy in the decision whether to get vaccinated, a preference of inaction over vaccination, a lesser sense of personal responsibility, and high self-protection motives increased the probability of no intention to get vaccinated. Social cognitive predictors were identified that explain the intention to get vaccinated against influenza of HCP, which in turn proved to be a good predictor of behaviour. Future interventions should focus on these variables to increase vaccination coverage rates.

1. Introduction

Influenza vaccination of healthcare personnel (HCP) reduces all-cause morbidity and mortality especially of those at high risk for influenza complications: young children, people above the age of 65 and high-risk patients [1–4]. Focusing on Europe, all HCP are advised by Health Authorities to get vaccinated against influenza annually [5,6]. Unfortunately, with vaccination coverage rates ranging from 6.4–26.3% among European HCP [7,8], the recommendations have not had their intended impact, and recent intervention programs developed to increase vaccination rates show at most small effects [9–13].

In order to identify the social cognitive variables that predict influenza vaccination uptake by HCP, a detailed analysis is needed. As suggested by Kok et al. [14], systematic approaches (i.e. Intervention Mapping) have the potential to eventually lead to the successful development and implementation of programs to increase vaccination coverage rates among HCP. We therefore developed an online survey instrument, which assessed a combination of social cognitive variables from the Reasoned Action Approach (RAA) [15], and previous research [16]. The purpose of the present study was to replicate results of one of our previous cross-sectional studies that had shown that the utilized social cognitive variables contribute largely to the explanation of HCP's motivation to get vaccinated against influenza [17]. However, this time we additionally conducted a follow-up survey to test whether the intention to get vaccinated, as well as the measured social cognitive variables, are good predictors of the actual vaccination behaviour of HCP.

The RAA is a social cognition model that specifies potentially modifiable antecedents of health behaviours [15]. The basic assumption of this model is that the motivation to perform a certain behaviour is reflected in people's *intention*, which is determined by *attitude*, *perceived norms*, and *perceived behavioural control*. We further included measures of risk-perception, which includes the constructs of *perceived susceptibility* to experience negative consequences if one does not perform the behaviour under consideration and the *perceived severity* of those consequences. Moreover, the survey includes questions covering possible motivating factors for vaccination uptake (i.e. feelings of personal responsibility to protect

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others, self-protection motives), and inhibiting factors for vaccination uptake (i.e. the disbelief in the scientific evidence of the effectiveness of influenza vaccination and its relevance) that have been described in previous research [10,18–23]. Next to these concepts, measures of three additional beliefs were included that had been identified in a qualitative study we recently conducted [16]. Some people had indicated that they favour risking an illness instead of performing a behaviour that might prevent illness such as vaccination, when the performance of the behaviour itself is believed to entail risk. We called this phenomenon *omission bias*, taking over Asch and colleagues' definition of the preference of inaction over action, even though inaction is more likely to result in a harmful outcome [24]. Another commonly stated reason for non-immunization was the belief that vaccination weakens the natural immune system, which will be referred to as *naturalistic beliefs*. Finally, *prevention beliefs* constitute the opinion that other means of prevention (i.e. regular hand disinfection, staying at home when ill) are more effective in preventing influenza than vaccination [26].

The aim of this longitudinal study was to test with a survey whether the intention to get vaccinated, as well as the measured social cognitive variables, are good predictors of the actual vaccination behaviour of HCP. The social cognitive variables that will be identified to predict actual vaccination uptake can serve as reference points for the systematic development of a program to increase influenza vaccination uptake of HCP.

2. Methods

2.1. Participants and procedure

Dutch HCP belonging to an online panel ($N = 1370$) were invited in the last week of September 2013 to participate in a longitudinal survey about the factors that influence the decision to get vaccinated against influenza (baseline). HCP in the Netherlands commonly get offered influenza vaccination between October and November. Participants who got vaccinated before the last week of September were excluded from the sample ($N = 23$), as were HCP that indicated that they did not have direct patient contact ($N = 199$). In total, 556 participants were included in the baseline measure (response rate 40.6%). To link intention to actual vaccination behaviour, participants who completed the first questionnaire were sent a second questionnaire in the last week of November 2013 (follow-up). The follow-up survey was completed by 458 (82%) participants.

2.2. The questionnaires

The first online questionnaire consisted of 42 questions targeting social cognitive variables and additional beliefs about annual influenza vaccination, past behaviour, and socio-demographics. Variables were measured on 7-point Likert scales ranging from 1 = totally disagree to 7 = totally agree, unless otherwise indicated. Items measuring the same underlying theoretical construct were averaged into one single construct when internal consistency was sufficient (Cronbach's alpha $\alpha > .60$ or Pearson correlation coefficient $r > .40$). Table 1 provides an overview of the constructs and their internal consistency. In addition, past behaviour was measured with two questions ('In past years I got vaccinated against influenza, when it was offered to me: 1 = always; 7 = never.'; 'Did you get vaccinated against influenza this year (season 2012/2013)? yes/no.'). Past experience with influenza was measured with two questions ('How often did you have influenza in the past? 1 = never; 7 = more than 10 times.'; 'Did you have influenza last winter? no/yes, once/yes, more than once.'). These items measured own experiences of influenza-like illness (ILI) instead of laboratory confirmed influenza. Demographic measures assessed profession (physician/nursing staff/other HCP), gender and age.

The follow-up questionnaire consisted of five questions. Behaviour was measured with one question ('Did you get vaccinated against influenza in the past three months? yes/no'). Participants who indicated that they got vaccinated against influenza were asked about the vaccination location and experiences with the vaccination ('Where did you get vaccinated against influenza? At work/at my general practitioner/other, namely'; How would you describe your vaccination experience? 1 = very good; 7 = very bad, 1 = very pleasant; 7 = very unpleasant, 1 = very painful;7 = not at all painful; Did you experience a reaction or side-effects from the vaccine? Specify.'). Participants who indicated that they did not get vaccinated were asked to specify their reasons for non-immunization ('Specify shortly why you did not get vaccinated against influenza.').

2.3. Data analysis

SPSS 20.0 was used to analyse the data. Following a descriptive analysis of the sample (frequencies), univariate associations between intention and social cognitive variables were analysed with Pearson correlation coefficients. Intention was shown to be distributed *U*-shaped and to best be classified into three groups; no intention to get vaccinated against influenza (0 = 1.0–2.0), not having made a clear decision about vaccination (1 = 2.5–5.5), and a high intention to get vaccinated (2 = 6.0–7.0). Therefore, multinominal logistic regression was used to show the effect of the independent variables on the probability of (1) having no intention to get vaccinated vs. not having made a clear decision and (2) having a high intention to get vaccinated vs. not having made a clear decision. A logistic regression that included only HCP who participated in

Table 1
Overview of constructs measured by the online survey.

Variable	Number of items	Reliability	Example questions
Intention	2	$r = .92$	I intend to get vaccinated against influenza annually
Attitude	6	$\alpha = .90$	Getting vaccinated against influenza annually is: very good – very bad; comforting – frightening
Subjective norm	4	$\alpha = .77$	Most of my colleagues get vaccinated against influenza annually
Perceived susceptibility	2	$r = .40$	I am healthy, therefore I don't need to get vaccinated against influenza annually
Perceived severity	2	$r = .48$	Influenza is a serious infection that can lead to complications
Autonomy	1	n.a.	Getting vaccinated against influenza annually is completely up to me
Capacity	1	n.a.	I am confident that I could get vaccinated against influenza annually (if I want to)
Omission bias	1	n.a.	I prefer to get influenza, instead of getting vaccinated against influenza
Naturalistic beliefs	3	$\alpha = .87$	I think that it is better to undergo influenza, then to get vaccinated against influenza annually
Disbelief science	2	$r = .70$	As far as I know, there is insufficient scientific evidence that influenza vaccination is effective in preventing influenza
Disbelief relevance	3	$\alpha = .81$	I think that the relevance of the annual influenza vaccination is overestimated
Prevention beliefs	3	$\alpha = .65$	By staying at home when I am ill, I can sufficiently protect patients from getting influenza
Personal responsibility	4	$\alpha = .72$	I think it is part of the responsibilities as a HCW to get vaccinated against influenza annually
Self-protection	1	n.a.	If I would get vaccinated against influenza annually, I would do it to protect myself