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Influenza immunization of Dutch general practitioners: Vaccination rate and attitudes towards vaccination

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ABSTRACT

With effect from the 2008/2009 season, yearly influenza immunization will be recommended to all Dutch general practitioners (GPs). For successful implementation of this recommendation, knowledge about the current vaccination rate and attitudes towards vaccination is necessary. In February 2008, a questionnaire was mailed to a random sample ($n = 730$) of practicing GPs. Vaccination rate was determined and the factors associated with not being vaccinated were assessed using multivariate logistic regression. Reasons for being vaccinated or not were also recorded. Of the 730 questionnaires sent out, 698 (96%) were completed and returned. In total, 248 GPs (36%) had been immunized against influenza. Independent factors related to not being vaccinated were female gender and age <40 years. Having no medical indication for an influenza vaccination and the conviction that one is protected against influenza because of frequent professional exposure to the virus were the most frequently reported reasons for not being vaccinated. The most frequently reported motives for being vaccinated were personal protection against influenza and a lower risk of transmitting the virus to patients. Education of GPs about the effects of vaccination is needed to ensure their compliance to the current recommendation of yearly influenza immunization.

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1. Introduction

Influenza is a major respiratory tract infection that can cause substantial morbidity and mortality, especially in frail elderly individuals [1,2]. Vaccination against the influenza virus is considered the best preventive measure. However, the immune response of the elderly (especially those with comorbidities) to the influenza vaccine is reduced, and results in decreased clinical protection [3–6]. Another protective measure is to reduce exposure to the influenza virus. Since healthcare workers are often in contact with influenza patients, they are considered a potential source of transmission. Therefore, vaccinating healthcare workers is advocated in order to prevent transmission of the virus to vulnerable patients [7,8]. Moreover, vaccination gives healthcare workers personal protection against influenza, thus reducing absenteeism from work, especially during influenza epidemics.

In accordance with international guidelines, yearly influenza vaccinations will be actively recommended for Dutch general practitioners (GPs) starting in the 2008/2009 season [9]. For successful implementation of this recommendation, however, knowledge

about the current vaccination rate and attitudes towards vaccination is necessary. To gain this knowledge, we conducted a questionnaire study among GPs to obtain insight into their present vaccination status and their reasons for (not) being vaccinated.

2. Methods

2.1. Setting and study subjects

In February 2008, a questionnaire was mailed to a random sample of 10% of all practicing members of the Dutch College of General Practitioners (DCGP). A reminder was sent 3 weeks later, regardless of the response to the first mailing. The DCGP is the scientific association of GPs that is engaged in the development and implementation of professional guidelines for GPs. Approximately 85% of all practicing Dutch GPs are members of this association.

2.2. Questionnaire

In an anonymous questionnaire, GPs were asked to report whether or not they had been vaccinated against influenza during the 2007/2008 season and their reasons for (not) being vaccinated. The questionnaire had a multiple-choice design with pre-formulated reasons for vaccination and reasons why they were

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Table 1
Characteristics of respondents compared with national figures

	Respondents (n = 698)	All Dutch GPs ¹⁰ (N = 8673)
GP characteristics	Number (%)	Number (%)
Gender (male) ^a	273 (39.5)	3066 (35.4)
Age groups ^b		
<40	174 (25.5)	1,789 (20.6)
40–49	227 (33.2)	2,820 (32.5)
>49	282 (41.3)	4,064 (46.9)
Employment ^c		
≤0.6 fte	181 (25.9)	24.6%
>0.6 fte	509 (72.9)	75.4%
Working in a ^d		
Solo practice	152 (21.9)	22%
Non-solo practice	542 (78.1)	78%

^a 6 missing values among the respondents.^b 15 missing values among the respondents.^c 8 missing values among respondents.^d 4 missing values among respondents.

not vaccinated. The respondents could tick one or more alternatives. They could also write down their reason if it was not covered by the given options.

Some additional questions about demography (age, gender) and practice-related characteristics (percentage of full-time employment [\leq or >0.6 fte]; solo or group practice) were included in the questionnaire.

2.3. Outcome measures

There were two outcome measures in this study: (1) the actual vaccination status of the GPs and (2) the assessment of the determinants and the reasons for (not) being vaccinated against influenza.

2.4. Data analysis

In order to assess the determinants related to not being vaccinated, we first excluded those GPs who mentioned a medical indication for their influenza vaccination ($n=42$). Then, we categorized age into three almost equal-sized age groups (<40 years; 40–49 years; >49 years) and assessed the univariate associations of the demographic and practice-related determinants of not being vaccinated. All determinants with a p value <0.1 in the univariate analysis were then used to determine the multivariate associations.

Table 2
Distribution, risk ratio, and adjusted risk ratio of the potential determinants for not being vaccinated against influenza ($n=638^a$)

Non-vaccinated/number of GPs (%)	Risk ratio (95% CI)			
		Unadjusted univariate	Adjusted multivariate	P value
GP characteristics				
Gender				
Female	209/266 (78.6)	1.26 (1.14–1.40)	1.20 (1.07–1.34)	0.001
Male ^b	240/386 (62.2)	–	–	
Age				0.026
<40	135/167 (80.8)	1.31 (1.16–1.48)	1.20 (1.05–1.37)	0.005
40–49	145/217 (66.8)	1.08 (0.94–1.23)	1.02 (0.89–1.17)	0.733
>49 ^b	162/260 (62.3)	–	–	
Employment				
≤0.6 fte	133/171 (77.8)	1.19 (1.07–1.32)		
>0.6 fte ^b	314/480 (65.4)			
Working in a				
Non-solo practice	371/518 (71.6)	1.24 (1.06–1.45)		
Solo practice ^b	78/135 (57.8)	–		

^a The study participants included in the multivariate model are only those with complete data.^b Reference category in each variable.

Finally, all determinants with a p value ≤ 0.05 were used in the final multivariate logistic regression model. Risk ratios (RR) and their 95% confidence intervals (95% CI) were reported as measures of association. We also calculated the frequencies of the reasons for (not) being vaccinated. These were reported as percentages. Data were analyzed using SPSS for Windows (version 12.0).

3. Results

3.1. Response rate to the questionnaire

Of the 730 questionnaires sent out, 698 (96%) were completed and returned. While the distributions of both the demographic and practice-related characteristics were comparable with national figures (Table 1), [10] our study sample contained slightly more females (40% vs. 35%) and young GPs (<40 years: 26% vs. 21%; >49 years: 41% vs. 47%).

3.2. Vaccination rates

In total, 248 (36%) GPs were vaccinated against influenza during the 2007/2008 season, 42 (6%) of whom because of a medical indication. The vaccination rate of the GPs without a medical indication was 31% (206/656). Fewer females (57/266, 21%) than males (146/386, 38%) were vaccinated. Moreover, fewer GPs with part-time employment (≤ 0.6 fte) and those working in a non-solo practice were vaccinated than GPs with a larger employment and those working single-handed (Table 2).

3.3. Determinants of not being vaccinated

In the univariate analysis, female gender (RR 1.26; 95% CI 1.14–1.40), age <40 years (RR 1.31; 95% CI 1.16–1.48), part-time (≤ 0.6 fte) employment (RR 1.19; 95% CI 1.07–1.32), and working in a group practice (i.e. not solo) (RR 1.24; 95% CI 1.06–1.45) were associated with not being vaccinated against influenza. Although not statistically significant, age between 40 and 49 years was also associated with no vaccination. In the final multivariate logistic regression model, only female gender (adjusted RR 1.20; 95% CI 1.07–1.34) and age <40 years (adjusted RR 1.20; 95% CI 1.05–1.37) were significantly associated with no influenza vaccination. Employment and practice profile were not independent determinants of not being vaccinated in the final multivariate model (Table 2).

Table 3Reasons for not being vaccinated against influenza among non-vaccinated GPs ($n = 450$); the respondents could give more than one reason

Reason for not being vaccinated	Number (%)
I have no medical indication for vaccination	235 (52)
I am protected against influenza by frequent professional exposure to the virus	125 (28)
I doubt whether vaccination will be effective	73 (16)
I forgot the vaccination	61 (14)
I fear adverse effects from vaccination	28 (6)

Table 4Reasons for being vaccinated against influenza among vaccinated GPs ($n = 248$); the respondents could give more than one reason

Reason for being vaccinated	Number (%)
Vaccination will reduce the risk of getting influenza	184 (74)
Vaccination will reduce the risk of transmitting the virus to patients	88 (36)
I have a medical indication for vaccination	42 (17)
There were some vaccines left in the practice	18 (7)
Other motives	8 (3)

3.4. Reasons reported for (not) being vaccinated

Having no medical indication for influenza vaccination (52%) and the conviction of being protected against influenza because of frequent professional exposure to the virus (28%) were the most frequently mentioned reasons for not being vaccinated (Table 3). The most frequently reported reasons for being vaccinated were personal protection against influenza (74%) and a lower risk of transmitting the virus to patients (36%) (Table 4). Males reported doubt about the vaccine's effectiveness more frequently than females as the reason for not being vaccinated (M 20% vs. F 12%), whereas females mentioned fear of adverse effects more often (M 3% vs. F 10%). There were no differences in the frequencies of the reported reasons across age groups (data not shown).

4. Discussion

Our study showed that 64% of the Dutch GPs had not been vaccinated against influenza during the 2007/2008 season. Independent determinants of not being vaccinated were female gender and age <40 years. Having no medical indication for influenza vaccination and the conviction of being protected against influenza because of frequent professional exposure to the virus were the most frequently reported reasons for not being vaccinated. The most frequently reported reasons for vaccination of GPs who did not mention a medical indication were personal protection against influenza and the lower risk of transmitting the virus to patients.

Some possible limitations need to be addressed in order to appreciate the results of our study. First, since not all practicing Dutch GPs are members of the DCGP, our random study sample could entail selection. However, since the distribution of the demographic and practice-related characteristics roughly corresponded with national figures (Table 1) and the response rate to the questionnaire was high (96%), we think that our findings can be generalized to the entire population of Dutch GPs. Second, because of the questionnaire's design (short and easy to complete), vaccinated GPs were presented a different set of pre-formulated reasons for being vaccinated than their colleagues who had not been vaccinated. Consequently, these reasons could not be entered into the multivariate model and we were unable to assess their independent contribution to the decision about vaccination.

This is first study to assess the rate of influenza vaccination among Dutch GPs. Because females and young GPs were slightly over-represented in our study sample, the rate of influenza vaccination among all Dutch GPs may be a little higher. The observed vaccination rate exceeds the reported rate among Dutch nursing-home healthcare workers (11% [11]), but is considerably lower than the previously reported vaccination rates among institution-based physicians (e.g., 48% [12], 69% [13], 82% [14]). Although GPs were informed about the advisability of influenza vaccination through recent publications in Dutch medical journals [15,16], the recommendation was not included in the DCGP guidelines for the 2007/2008 season. Since vaccination is now included in the recommendations for the 2008/2009 season, an increase of the vaccination rate can be expected.

Similar inquiries have been preformed in three other countries. A study performed in Israel showed an influenza vaccination rate among GPs of 40% (comparable to our study), but only 94 GPs (with a response rate of 72%) had been included in this study [17]. Semaille et al. studied the attitude towards various vaccinations in a large sample of Belgian GPs [18]. They recorded an influenza vaccination rate of 67%, but only specifically addressed reasons for not being vaccinated. Cowan et al. (United States) showed a high influenza vaccination rate among GPs (87%), but the low response rate (38%) was a potential for response bias [19].

In our study, about 35% of the non-vaccinated GPs were convinced that they were protected against influenza because of their frequent professional exposure to the virus. Indeed, GPs probably have higher basic antibody titres against influenza than healthy adults [20,21]. Recent research, however, has shown that this basic immunity is suboptimal, with reported seroprotection rates of 42% and 80% in non-vaccinated GPs [21]. Vaccination has been shown to increase these rates and to prevent both respiratory tract infections in general and proven influenza during an influenza epidemic, especially in young GPs [22].

The risk of getting influenza is only partly determined by professional contacts. GPs are liable to become infected at home by family members suffering from influenza. Children, in particular, are very contagious [22,23]. In our study, younger age (<40 years) was an independent determinant for not being vaccinated against influenza. This is plausible as most young GPs are healthy and may feel that they can withstand a minor illness like flu. However, as a member of a young family, they are very prone to come in contact with and thus spread the influenza virus. Young GPs should, therefore, be the first to be vaccinated against influenza [22].

A reduction in the risk of getting influenza was the most frequently reported reason for being vaccinated. This suggests that GPs predominantly use vaccination to reduce absenteeism due to influenza. Several studies have confirmed this result [24-26]. Although the reported reduction in influenza-related sick leave is estimated to be rather small (0.4 [25]-2.0 [26] days), the collective benefits may be considerable during an influenza epidemic.

Only a minority of the vaccinated GPs reported a reduction in the transmission of the virus to patients as a motive for vaccination. GPs might either be unaware of this rationale or not convinced by the evidence for it. Indeed, evidence for this motive was not conclusive until recently [27]. A recent randomized controlled trial in British nursing homes demonstrated that vaccinating nursing-home staff against influenza reduced the mortality of residents during periods of moderate influenza activity [28]. This effectiveness has not yet been assessed in general practice; however, since GPs frequently have intensive contact with vulnerable patients and these patients are incompletely protected by vaccination, vaccinating GPs against influenza is regarded worthwhile [7,8,29].

The response rate to our questionnaire was 96%. The simplicity and conciseness of our questionnaire probably contributed to this

remarkably high response. It could also be indicative of GP interest in the important issue of influenza and influenza vaccination.

In conclusion, this study showed that the influenza vaccination rate among Dutch GPs is suboptimal. Education of GPs about the effects of vaccination is needed to ensure their compliance to the recently launched recommendation of yearly influenza vaccination.

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