

Patient's perceptions and information provided by the public health service are predictors for influenza vaccine uptake

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The objective of this study is to determine whether a patient's perception about, and information received from health services can be seen as predictive tools in regard to vaccination coverage against influenza.

Individual data from 7,341 adults included in the Madrid City Health Survey conducted in 2005 were used. With the objective of discovering the level of satisfaction with the public health system in mind, the question "In your opinion, does the public health care system in the city of Madrid work properly?" was asked to the population so as to obtain an affirmative/negative answer with respect to public health services. Overall influenza vaccination coverage was 24%. Logistic regression models indicate that the population more satisfied with as well as those who believe they are sufficiently informed by the health services are more likely to receive the vaccine against influenza (OR = 1.23, 95% CI = 1.06–1.43). Visits to a physician also constitute a statistically significant association.

Improving the perception with the public health system and the information provided to the population may help to increase influenza vaccination uptake.

Introduction

The efficacy of influenza vaccination has been demonstrated by means of clinical trials and observational studies.¹⁻³ Said vaccine reduces the occurrence of this disease in healthy subjects under 65, as well as decreasing related complications, hospitalizations and death in subjects over 65 and in subjects who suffer underlying medical processes regardless of their age.^{2,3}

However, vaccination coverage in Spain among subjects for whom this vaccine is necessary is not as high as it should be, although it is recommended and funded by our National Health System. The health authorities in Spain have—as in the USA and most other developed countries—been recommending annual influenza vaccination for all subjects above the age of 64 years, younger subjects with chronic diseases that render sufferers susceptible to influenza-related complications, and health care workers (HCWs). In all such cases vaccination is administered free of charge.⁴

Over the last decade, patient satisfaction has become an indicator of quality and efficiency of health services.^{5,6} A direct relationship was found between such satisfaction and adherence, by the population, to certain preventive measures such as vaccination.⁷ There is substantial evidence demonstrating that the information received by the patient from the primary health care systems, improves vaccination rates in developed countries.⁸

Different studies suggest that proper transmission of this information acts as an efficient tool to increase influenza vaccination rates amongst the adult population.⁹⁻¹¹

In this context, our study has the objective of determining whether satisfaction with our public health system and the information received by the patient from the health care services act as predictive tools with respect to vaccination coverage against influenza in adults living in Madrid (Spain).

Results

For study purposes, we used data on 7,318 subjects aged 16 years and over who answered the question on having received a flu shot in the latest campaign. The initial response rate for the Madrid City Health Survey (*Encuesta de Salud de la ciudad de Madrid-ESCM 05*) was 40%, with the main reasons for replacement being "repeated absence" (43.6%) and "refusal to participate" (25.2%). Details on the evaluation of non-respondents can be found elsewhere.¹²

Overall influenza vaccination coverage for the total sample was 24%. **Table 1** shows the results of the analysis of influenza vaccination coverage according to satisfaction with the public health system, knowledge about preventive measures, perception of information received and other variables with socio-demographic characteristics and comorbidity.

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Table 1. Influenza vaccination coverage according to subjects' socio-demographic variables and patient satisfaction and perception of information received

		Influenza vaccination status (% and 95% CI)		
		Vaccinated	Unvaccinated	TOTAL
Satisfaction with public health system	Satisfied	54.8 (52.2–57.3)	44.3 (42.8–45.8)	46.8 (45.6–48.1)
	Unsatisfied	45.2 (42.7–47.8)	55.7 (54.2–57.1)	53.2 (51.9–54.4)
Knowledge of preventive measures	Sufficient	75.1 (72.8–77.2)	70.9 (69.5–72.2)	71.9 (70.7–73.0)
	Insufficient	24.9 (22.8–27.2)	29.1 (27.8–30.5)	28.1 (27.0–29.3)
Perception of information received	Sufficient	52.0 (49.3–54.6)	44.0 (42.5–45.6)	45.9 (44.6–47.2)
	Insufficient	48.0 (45.4–50.7)	56.0 (54.4–57.5)	54.1 (52.7–55.4)
Medical consultation	No	60.8 (58.3–63.1)	77.5 (76.3–78.7)	73.5 (72.4–74.6)
	Yes	39.2 (36.8–41.7)	22.5 (21.3–23.7)	26.5 (25.4–27.6)
Age	16–49	24.7 (22.5–26.9)	69.8 (68.5–71.1)	59.0 (57.8–60.2)
	50–64	17.6 (15.8–19.5)	19.9 (18.8–21.0)	19.3 (18.4–20.3)
	≥65	57.7 (55.3–60.2)	10.3 (9.5–11.1)	21.7 (20.7–22.7)
Sex	Male	57.8 (55.4–60.3)	52.5 (51.0–53.9)	53.7 (52.5–55.0)
	Female	42.1 (39.7–44.6)	47.5 (46.1–49.0)	46.3 (45.0–47.5)
Educational Level	Junior school	41.7 (39.3–44.2)	17.5 (16.4–18.6)	23.3 (22.3–24.3)
	High school	36.7 (34.3–39.1)	51.9 (50.5–53.3)	48.2 (47.0–49.5)
	University and higher education	21.6 (19.6–23.7)	30.6 (29.3–32.0)	28.5 (27.4–29.6)
Nationality	Indigenous	93.9 (92.6–95.0)	84.8 (83.8–85.9)	87.0 (86.1–87.9)
	Immigrants	6.1 (5.0–7.4)	15.2 (14.1–16.2)	13.0 (12.1–13.9)
Comorbidity*	No	32.1 (29.8–34.5)	84.5 (83.4–85.5)	71.9 (70.8–73.0)
	Yes	67.9 (65.5–70.2)	15.5 (14.5–16.5)	28.1 (27.0–29.2)
TOTAL		24.0 (22.9–25.0)	76.0 (75.0–77.1)	

*Chronic conditions that indicate the advisability of influenza vaccination: Diabetes, asthma, chronic bronchitis and heart or brain disease.

The logistic regression model (Table 2) indicates that the population perceiving to be satisfied with the public health system show a significantly higher probability of receiving the vaccine against influenza (OR = 1.23, 95% CI = 1.06–1.43) than those who indicate that they are not satisfied.

Our results also show an association between influenza vaccination and the population who perceive that they are receiving enough information from the primary health care services, and with those people who have visited their physician in the 2 weeks prior to the interview.

Other variables associated with a probability of having received the influenza vaccine were: higher age (OR = 4.21, 95% CI = 3.22–5.50) and presence of an associated chronic disease.

Discussion

Our results show vaccination coverage values of 24% for the study population, an amount similar to that obtained in a recent study performed on the adult Spanish population.¹³

The results of this study indicate that satisfaction with the public health care system acts as a predictive factor in regard to the vaccination against influenza. Patient satisfaction can be used to assess the process of care by the health care system: a greater satisfaction level could be associated with the execution of preventive measures. Steven et al.⁵ performed a study by means of a questionnaire. In that study, patients who were more satisfied

claimed to be receiving a greater number of preventive measures than patients who were unsatisfied. In the same vein, and coinciding with our results, the North American study of Weingarten et al.⁷ found a statistically significant relationship between vaccination against influenza and satisfaction with the preventive measures received ($p = 0.001$).

There is substantial evidence to support the fact that the information received by the patient is an efficient tool in order to increase rates of vaccination against influenza amongst the adult population.^{8–10} In our context, the population who report that they are receiving enough information from the physician and/or nurse has a greater probability of having received the vaccine against influenza. These results coincide with those obtained in a recent investigation, the objective of which was to assess the efficacy of a system of reminders received by the patient on the improvement of immunization rates. A statistically significant association was found for influenza vaccination in adults (OR = 1.66, 95% CI = 1.30–2.09).⁸ In relation with all this, and in agreement with other investigations,¹⁴ visits to the physician also act as a predictive tool in regard to influenza vaccination. However, we have no way of knowing if the visit to the physician was a visit to their regular physician or not. There are studies pointing out that having a regular physician increases the probability of receiving preventive measures such as the influenza vaccine. Blewett et al.¹⁵ suggest that adults who are 50–64 years old and regularly visit their physician were 2.8 times more likely to have received the

influenza vaccine in the last year, when compared to those who had no regular physician.

In the multivariate analysis, advanced age and presence of concomitant chronic diseases are associated with influenza vaccination. These circumstances are logical, as these are indications for the administration of this vaccine in Spain. Yet, despite the fact that the vaccination coverage among the elderly living in Madrid is acceptable and similar to that in other European countries. Different authors agree with this observation.^{1,3,13}

There are a number of limitations to our study. Firstly, the use of unvalidated self-reported data on vaccination could entail possible bias. Secondly, any information obtained within an interview context may be subject to recall error or the tendency of interviewees to give socially desirable responses. In this sense, we should bear in mind that both satisfaction with and perception of information received have an important subjective component. Lastly, the type of information received by the interviewed population remains unknown, as it is not recorded in the survey. However in Spain, campaigns targeting all persons at risk of suffering influenza-related complications are conducted every year, and include television, radio and newspaper advertising as well as notices at health centres. Similarly, campaigns have also targeted health-care professionals with the aim of enhancing their knowledge about influenza vaccine recommendations and effectiveness.

To finalize, we can conclude that both the satisfaction of public health system users and the fact of perceiving themselves as properly informed by the health care services is consistent with the idea that increase the probability of receiving the influenza vaccine among the population of Madrid (Spain).

These circumstances should be taken into account by the health care authorities in order to promote, amongst the population, the practice of preventive measures such as influenza vaccination, thus improving current vaccination coverage. This should be done without detriment to the quality of the information received by the citizens regarding health care questions. Some other strategies that have demonstrated their effectiveness in enhancing vaccination coverages, and should thus also be considered and recommended, include: lowering the age at which the influenza vaccination recommendation becomes universal; telephoning or mailing personal reminders; compliance monitoring; using computerised systems to identify high-risk patients; improving medical records; empowering nurses to vaccinate patients directly; and drawing up purpose-made influenza-vaccination timetables.

Materials and Methods

A descriptive, cross-sectional study was conducted on influenza vaccination coverage among adult subjects (ages 16 years and over) living in Madrid, Spain's capital city, with a population of approximately 3.2 million.¹²

Our study was based on individual data drawn from the Madrid City Health Survey (*Encuesta de Salud de la ciudad de Madrid-ESCM 05*). This survey was undertaken by the Madrid City Council from November 2004 to June 2005 on a

Table 2. Adjusted odds ratios (OR) and 95% confidence interval, for variables associated with influenza vaccination

		Adjusted OR	95% CI
Patient satisfaction	Unsatisfied	1	-
	Satisfied	1.23	(1.06–1.43)
Perception of information received	Insufficient	1	-
	Sufficient	1.16	(1.00–1.35)
Medical consultation	No	1	-
	Yes	1.55	(1.32–1.81)
Age	16–49	1	-
	50–64	1.97	(1.63–2.38)
	≥65	4.21	(3.22–5.50)
Comorbidity*	No	1	-
	Yes	3.90	(3.06–4.96)

*Chronic conditions that indicate the advisability of influenza vaccination: Diabetes, asthma, chronic bronchitis and heart or brain disease.

representative sample of the non-institutionalized population of the city of Madrid. The sampling procedure was conducted in two stages, with stratification by clusters. The survey covered a total of 7,341 adults, and the estimated overall sample error was +/- 0.7%.

Information was collected through personal, home-based interviews using a structured questionnaire. Details of *ESCM 05* methodology,¹² as well as the results regarding vaccination coverage according to socio-demographic characteristics and risk factors,⁴ are described elsewhere.

In order to assess influenza vaccination status, we considered the response (yes or no) to the question, “Did you have a flu shot in the latest campaign?”

With the objective of discovering the level of satisfaction with the public health system in mind, the question “*In your opinion, does the public health care system in the city of Madrid work properly?*” was asked to the population so as to obtain an affirmative answer (very good and good, its satisfied) or a negative answer (very bad, bad or regular its unsatisfied) with respect to public health services. In regard to knowledge about preventive measures, we have analyzed the answers to the question “*Do you feel sufficiently informed about disease prevention programs and healthy habits?*” (with *sufficiently informed* or *not sufficiently informed* as possible answers). The information received was assessed by the question “*According to your point of view, has the primary health care physician and/or nurse given you enough information in this respect?*” (with *sufficiently informed* or *not sufficiently informed* as possible answers). The population was also asked about visits to the physician in the 2 weeks prior to the interview.

The following independent variables: age; sex; nationality (immigrant or indigenous), and presence of any associated chronic conditions that indicate the advisability of influenza vaccination (diabetes, asthma, chronic bronchitis and heart or brain disease) were analyzed for adjustment. The dichotomous (yes/no) variable, “comorbidity”, was created on the basis of self-reported presence of any of the chronic diseases analyzed.

Anti-influenza coverage was calculated by estimating the proportion of individuals who were vaccinated against influenza, and their corresponding 95% confidence intervals (95% CI). Influenza coverage was described and compared according to the study variables.

Multivariate logistic regression models were generated so that, using influenza vaccination as the dependent variable, we could then determine whether satisfaction with the public health system and the information received by the patient were independently associated with influenza vaccination, after adjusting for the other socio-demographic and comorbidity variables.

Estimates were made using the “svy” (survey commands) functions of the STATA program, which enabled us to

incorporate the sampling design and weights into all of our statistical calculations (descriptive, confidence intervals, logistic regression). Statistical significance was set at $p < 0.05$ (p values are two-tailed).

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