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Prevalence and factors associated with influenza vaccination of persons over 65 years old in Spain (2009–2014)

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ABSTRACT

Background: Influenza is a major public health problem. Achieving 65% coverage in people over 65 years old is a health policy priority in Spain.
Objective: To determine the coverage of influenza vaccination in Spain in 2014 for people over 65 years and to analyze the factors associated with coverage and its progression between 2009 and 2014.
Methods: A descriptive cross-sectional study was conducted that included 18,442 non-institutionalized individuals over 65 years who had participated in the National Health Survey in Spain in 2011 and in the European Health Survey in Spain in 2009 and 2014. Socio-demographic variables, health variables, and influenza vaccination data were used. A logistic regression analysis was performed to determine the variables associated with anti-influenza vaccination.
Results: Influenza vaccination coverage has declined from 2009 (74.5%) to 2014 (57.4%). There are significant differences in the vaccination coverage among the different Spanish autonomous communities in the different years studied. Influenza vaccination was associated with males, low social class, and low level of education. There is greater participation in other preventive measures, such as assessing blood pressure, blood glucose, and cholesterol, than in influenza vaccination.
Conclusions: Fewer people over 65 years old than recommended by the WHO participated in the influenza vaccination campaign in Spain in 2014. This coverage declined progressively from 2009 to 2014.

1. Introduction

Influenza is a major public health problem that can lead to mortality (directly or indirectly), high economic and social costs, and numerous repercussions and complications. Globally, influenza epidemics cause 3–5 million cases of serious illness and 250,000 to 500,000 deaths annually [1].

In industrialized countries, most influenza-related deaths occur in those older than 65 years old [2]. Each year in the USA, influenza is associated with approximately 30,000 deaths, 1250,000 hospitalizations, and billions of dollars in healthcare costs [3].

In a study estimating the worldwide mortality associated with the influenza pandemic in 2009, there were reported 201,000 deaths from respiratory causes and 83,330 cardiovascular deaths. 80% of these deaths, both respiratory and cardiovascular, occurred in people over 65 years old [4].

In Spain, according to the Influenza Surveillance Report [5] of the 2015/16 season, 3101 confirmed severe hospitalizations for influenza were reported, of which 1071 (35%) were admitted to the ICU and 352 (11.4%) died. The highest proportion of hospitalized cases were concentrated in people over 65 years old (40%), as were cases of death (59%). Notably, more than half (59%) of the patients recommended for vaccination had not received the influenza vaccine that season.

The most effective way to prevent influenza and its serious consequences is through vaccination [6]. In fact, safe and effective vaccines have been used to combat influenza for more than 60 years. The main objective of this immunization is to reduce the mortality

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and morbidity associated with influenza and the impact of its consequences on the community [7]. To achieve this objective, the persons at greatest risk should be protected.

One of the priorities in the use of influenza vaccines is increased coverage in the population 65 years old or older. In Spain, the objective is to reach 65% coverage in this group and to become closer to the goal established by the World Health Organization (WHO) and the European Commission of achieving coverage of at least 75% in this elderly population [8]. Many countries have currently implemented vaccination programs, and the influenza vaccine is included in the *Catalog of Benefits of the National Health System for Primary Care* in Spain that guarantees free and open access at the point of service.

Vaccination against influenza in the elderly prevents between 30 and 40% of all hospital admissions and deaths from diseases related to this viral infection in developed countries [9]. In the USA, the seasonal influenza vaccine prevented more than 40,000 influenza-related deaths over a 9-year period from 2005–2006 through 2013–2014 [10]. Therefore, it is essential to continue working on the awareness of citizens and health professionals regarding the importance of influenza vaccination.

Despite the different studies on the benefits of influenza vaccine, a considerable proportion of people over 65 years old remain unvaccinated every year, with the negative consequences that this entails, as detailed in the previous sections.

Furthermore, previous studies [11–13] that have assessed the beliefs and attitudes of populations older than 65 years old regarding influenza vaccination emphasized that the subjects reject influenza vaccination for the following reasons: they do not consider themselves susceptible to infection (22%), they fear adverse vaccination events (18%), or they believe that alternative treatments are more effective than vaccination for preventing the disease.

Therefore, the objectives of the present study were to identify the coverage of influenza vaccination in Spain in 2014 for people over 65 years old, to analyze the factors associated with influenza vaccination, and to analyze its progression from 2009 to 2014.

2. Methods

2.1. Design

Cross-sectional descriptive study

2.2. Source of information, scope of study, and sample

Data were obtained from the records of the National Health Survey in Spain (*Encuesta Nacional de Salud en España – ENSE*) of 2011/12 [14] and the European Health Survey in Spain (*Encuesta Europea de Salud en España – EESE*) of 2009 [15] and 2014 [16] (the institutional latest records published). The ENSE and EESE were performed in a representative manner (each participant was assigned a weighting coefficient to ensure representativeness) by the National Institute of Statistics (*Instituto Nacional de Estadística – INE*) and the Ministry of Health, Social Services and Equality (*Ministerio de Sanidad, Servicios Sociales e Igualdad – MSSI*). These surveys were conducted in a non-institutionalized population residing in Spain, with representation from all the autonomous communities to constitute representative samples of the population. The sampling design was multistage stratified cluster sampling with the proportional probability of selection of primary sampling units (municipalities), and the secondary (sections) and third (individuals) units by random routes and sex and age quotas.

For the current study, all the records corresponding to people older than 65 years old were selected. The final sample constituted a total of 18,442 records; 6026, 5896, and 6520 for the years 2009, 2011, and 2014, respectively.

2.3. Variables

The independent variables included in the study were year of the survey, sociodemographic variables (autonomous community, age, gender, marital status, educational level, current domestic situation, and social class), and health-related variables (chronic or long-term illness, perception of health status, degree of limitation, blood pressure (BP) taken by a healthcare professional in the last year, blood cholesterol level measurement in the last year, measurement of blood glucose level in the last year, body mass index (BMI), and who recommended influenza vaccination). The dependent variable was the response (“yes” or “no”) to the question *have you been vaccinated for influenza in the last year*.

2.4. Procedure

Anonymized microdata files were downloaded from the INE website, which is publicly accessible and does not require special permission for downloading. After the download, the database was debugged, transferred, and processed using the IBM SPSS Statistics 22 program for analysis. For the purpose of this study we only used the records from people over 65 years using the subpopulation command in SPSS. Regarding the inter-annual comparability of the surveys, the question of *have you been vaccinated against influenza in the last year* was identical (and therefore comparable) in the surveys of 2009, 2011/12, and 2014.

2.5. Data analysis

For the statistical analysis, the coverage of influenza vaccination in the three periods studied was estimated by calculating counts (n) and percentages (%) for the qualitative variables and by calculating the mean (m) and standard deviation (SD) for the quantitative variables. We also compared proportions of categorical variables using chi-square tests for contingency tables. In addition, a multiple logistic regression was performed to identify how the independent variables influenced participation in vaccination campaigns. Participation was assessed using the Wald statistic, in which the variables with $p \geq .15$ were eliminated one by one from the model. Significant values were those whose confidence level was 95% ($p < .05$); all contrasts of hypotheses were bilateral.

3. Results

A total of 18,442 records of people aged 65 and older who participated in the ENSE 2011 and EESE 2009 and 2014 (6026 in 2009, 5896 in 2011, and 6520 in 2014) were analyzed.

More than 99.98% of the subjects responded to the question on influenza vaccination in the three surveys analyzed.

The profile of subjects who claimed to have been vaccinated against influenza (n = 11,663) had the following characteristics: predominantly female sex (60.2%) and a mean age of 75.78 years (SD ± 7.43). In terms of marital status, 49.4% were married, and 40.2% were widowed. A total of 38.5% had completed primary education, and 39.3% considered their health status normal in a subjective question on the topic. Additionally, 85.3% of subjects answered affirmatively that they had a chronic or long-term disease, and 56.3% had some degree of limitation (85.3% had a physical limitation) in the last 6 months. The social class of the person of reference who had been vaccinated against influenza was also assessed, and 37.5% belonged to social class V (qualified workers in the primary sector and other semi-skilled workers) [14–16].

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