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RESEARCH

# INFLUENZA VACCINATION IN 65 AND OVER AGE ADULTS IN ANTALYA/TURKEY

## ABSTRACT

***Introduction:*** Influenza is a health threat to the elderly as it may lead to serious complications. Studies demonstrated that influenza vaccination is safe and effective in preventing and controlling infection among the elderly. The aim of the study was to determine the vaccination status against influenza in the over 65 year-old age group in Antalya.

***Materials and Method:*** A total of 2383 individuals were surveyed during the 2005-2006 influenza season in Antalya, a city in the south of Turkey. The survey form included 14 questions about influenza vaccine.

***Results:*** Of the study sample, 55.7% were aware of the influenza vaccine. However, it was determined that only 15.0% had received an influenza vaccine.

***Conclusion:*** The study found that rate of influenza vaccination was low among adults aged sixty-five and over in Antalya. Physicians need to recommend the influenza vaccine especially to the elderly and public awareness should be increased. Influenza vaccine should be covered by health insurance.

***Key Words:*** Influenza Vaccines; Influenza, Human; Aged; Immunization.

ARAŞTIRMA

# ANTALYA'DA 65 YAŞ VE ÜZERİNDEKİ BİREYLERDE GRİP AŞISI İLE BAĞIŞIKLANMA DURUMU

## ÖZ

***Giriş:*** Grip, ciddi komplikasyonlara yol açabildiği için özellikle yaşlılarda bir sağlık tehdididir. Grip aşısının yaşlılarda infeksiyonun önlenmesinde ve kontrol edilmesinde güvenli ve etkili olduğunu çalışmalar da göstermiştir. Çalışmamızda Antalya'da 65 ve üzeri yaş grubunda grip aşısı ile bağışıklanma durumunun saptanması amaçlanmıştır.

***Gereç ve Yöntem:*** 2005-2006 yıllarında grip mevsimi boyunca Türkiye'nin güneyinde bir şehir olan Antalya'da toplam 2383 kişiye ulaşıldı. Araştırma formunda grip aşısıyla ilgili 14 soru vardı.

***Bulgular:*** Araştırma grubundakilerin %55.7'sinin grip aşısını duyduğu ve bildiği belirlendi. Ancak sadece gurubun %15'inin grip aşısı yaptırdığı saptandı.

***Sonuç:*** Antalya'da 65 yaş ve üzeri bireylerde grip aşısı yaptırma oranının düşük olduğu belirlenmiştir. Bu oranın artılması için doktorların özellikle yaşlılarda grip aşısını önermesi, halkın da bu konuda bilinçlendirilmesi ve grip aşısının sağlık sigortası kapsamına alınması gerekmektedir.

***Anahtar Sözcükler:*** Grip Aşısı; Grip; Yaşlılık; Bağışıklama.

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## Introduction

People over 65 years of age are considered as elder according to the World Health Organization (WHO). In 1950, there were about 200 million people over 65 around the world. By 2025, this number is expected to reach 1.2 billion. The trend is similar in Turkey. The proportion of elders in the total population is 6.9% and the number of the elderly will increase to 20 million (1).

Influenza is a health threat to the elderly as serious complications may result from infection (2). The annual winter outbreak of influenza is one of the major causes of morbidity and mortality among frail elderly people (3). Observational studies demonstrated that influenza vaccination is safe and effective in preventing and controlling infection among the elderly (4,5). Health authorities in a number of countries recommend older people to uptake influenza vaccination. The reported prevalence of influenza vaccination among community-dwelling elderly in some developed countries ranged from 51% to 78% (6,7). Efficacy and cost-effectiveness for the prevention of influenza in the elderly population have been documented (3,7).

The lack of adequate health records and insufficient number of research studies conducted in society are obstacles to the knowledge of the dimensions of influenza in Turkey. There are limited number of studies conducted in Turkey on the incidence of influenza and the administration of influenza vaccine. There are no detailed studies conducted to reflect the situation in Antalya. Based on this information in this cross-sectional study, the aim of this study was to determine the vaccination status against influenza in the over 65 year old age group.

## Materials and Method

The research population comprised of a total of 42,466 people over the age of 65 years who lived in 132 neighborhoods and were registered at one of the neighborhood primary health care clinics within the city limits of Antalya Municipality. Formulas were created [$n=(N \cdot t^2 \cdot p \cdot q)/(D^2 (N-1) + t^2 \cdot p \cdot q)$] while calculating the size of the samples, t-value was taken as 2.33, alpha error was taken as 0.02 level in the t-table and, therefore, a total of 3000 individuals took the survey in 150 clusters each one consisting of 20 people. From every cluster, 20 individuals were taken for a total of 3000 individuals who were administered the survey according to the plan. However, a total of 2383 individuals were reached for the study in Antalya, a city in the south of Turkey. The participation rate was 79.4%. There was no possibility of returning to the same area, so those who did not agree to be interviewed and those who were not at home were not included.

The survey form had 14 questions designed based on the researchers' opinions. The questions included descriptive information about the participants (age, gender, marital status, education status, health insurance) and whether or not they had been given the influenza vaccine in the current year. Because the individuals can distinguish between people for influenza and other upper respiratory tract infections, Influenza-like symptoms were defined as sudden onset of fever (<39ºC), overstrain, muscle and headache, dry cough, runny nose and congestion.

The surveys were completed in March, 2006. Three of the authors completed data by a self-administered questionnaire. Elderly people were visited in their own settings. The dates were determined prior to the interviewing process. In order to define the beginning address of each cluster, information was derived from primary health care units. The names and population of 132 quarters were listed and according to cluster range (cluster range=population of space/number of clusters=42466/150=283), 150 addresses were chosen systematically. After administering the survey in an address, the next one was arranged in the nearest house and when the number exceeded 20, the cluster was ended.

In the study, the dependent variable was influenza immunization status and independent variables were age, gender, marital status, educational status and health insurances. The data obtained were processed on the computer and evaluated using the Statistical Package for Social Sciences - SPSS 13.00 (SPSS Inc., Chicago, IL., USA) program using percentage and Binary Logistic Regression Analysis. A $p<0.05$ was considered statistically significant.

### Ethical Considerations

Before completing the form, the individuals were informed about the purpose and length of the research and they were explained that participation was voluntary and they could quit the study at any time. Oral consent to participate in this study was obtained. After receiving their permission, the researcher read aloud the questions to the participants and wrote their answers down on the questionnaire. The data used in this study were extracted from an aggregated anonymous database and submission to a research ethics committee was not required.

## RESULTS

The vaccination status according to some of the characteristics of the research group is shown in Table 1. The oldest participant was 98 years old and the youngest one was 65 years old. The mean age of the research group was 70.2 ± 5.1 years.

As can be seen in the table, 41.1% of the participants were in the 65-69 year-old age group, 50.6% were male, 71.2% were still married, 38.8% were illiterate and 49.3% were elementary school graduates, and 89.3% had health insurance.

Although 1328 (55.7%) of the participants knew that a vaccination was given for the influenza disease, only 357 (15%) had been vaccinated against influenza (Table 2). Of the entire research group, 705 individuals (29.6%) stated they had had influenza in the last three months. There were 46 individuals (12.9%) who had received the influenza vaccination who had the influenza illness within the last three months. This percentage was 32.5% (659 individuals) for those who had not received the influenza vaccination. The most common facility to have given the vaccination were pharmacies by 37.0% (132 individuals) followed by neighborhood primary health care units by 32.5%. The children of 33.3% of the participants (119 people) had recommended them to get vaccinated. Physicians recommended vaccination to 94 individuals (26.3%) in the research group. The cost of vaccination was paid by 69.5% of the participants themselves (248 people) and the remaining was covered by health insurance institutions (Table 2).

Gender, education and health insurance variables were found to be effective in having or not having the vaccination. According to Table 3, women had vaccination 1.41 times more than men (OR:1,41;P<0,005); educated participants had vaccination 3.20 times more than uneducated participants (OR:3,20;P<0,001); and insured participants had vaccination 3.88 times more than uninsured (OR:3,88;P<0,001).

**Table 1—** Socio-Demographic Characteristics of The Participants (N=2383)

| Characteristics | n | % |
|---|---|---|
| **Age Groups** | | |
| 65 – 69 | 979 | 41.1 |
| 70 – 74 | 702 | 29.5 |
| 75 – 79 | 419 | 17.5 |
| 80 – 84 | 183 | 7.7 |
| 85+ | 100 | 4.2 |
| **Gender** | | |
| Male | 1205 | 50.6 |
| Female | 1178 | 49.4 |
| **Marital Status** | | |
| Married | 1697 | 71.2 |
| Widowed | 686 | 28.8 |
| **Education** | | |
| Illiterate | 923 | 38.8 |
| Elementary school | 1176 | 49.3 |
| High school | 183 | 7.7 |
| University/academy | 101 | 4.2 |
| **Health Insurance** | | |
| Yes | 2129 | 89.3 |
| No | 254 | 10.7 |

**Table 2—** Findings of the Research Group (N:2383)

| Characteristics | n | % |
|---|---|---|
| **Knows That There is a Vaccine Against Influenza Disease** | 1328 | 55.7 |
| Received vaccination (n=357) | 357 | 15.0 |
| Total research group who stated they had had influenza in this year (n=2382) | 705 | 29.6 |
| Received vaccination but also had influenza in last three month (n=357) | 46 | 12.9 |
| Did not receive vaccination and had influenza in last three month (n=2026) | 659 | 32.5 |
| **At What Health Care Facility Did You Receive Your Vaccination? (n=357)** | | |
| At the pharmacy | 132 | 37.0 |
| At the neighborhood primary health care unit | 116 | 32.5 |
| At the hospital | 86 | 24.1 |
| At home | 23 | 6.4 |
| **Who Recommended You to Get Vaccinated? (n=357)** | | |
| My children, grandchildren, etc. | 119 | 33.3 |
| Doctor | 94 | 26.3 |
| Myself | 69 | 19.3 |
| My friends | 28 | 7.9 |
| Pharmacist | 18 | 5.1 |
| TV, newspaper | 15 | 4.2 |
| Primary health care units | 14 | 3.9 |
| **Who Paid for the Vaccination? (n=357)** | | |
| Myself | 248 | 69.5 |
| Health insurance | 109 | 30.5 |

**Table 3—** Binary Logistic Regression Results for Those who Received Vaccination (Antalya, 2006)

| Independent variables | Odds Ratio | p value | 95.0% C.I.for EXP(B) | |
|---|---|---|---|---|
| | | | Lower | Upper |
| **Gender** | | | | |
| Male | 1.00 | | | |
| Female | 1.41 | <0.005 | 1.11 | 1.79 |
| **Education** | | | | |
| Illiterate | 1.00 | | | |
| Others | 3.20 | <0.001 | 2.29 | 4.45 |
| **Health-Insurance** | | | | |
| No | 1.00 | | | |
| Yes | 3.88 | <0.001 | 2.03 | 7.42 |

## DISCUSSION

Influenza is a health threat to the elderly as serious complications may result from infection. Because the frail elderly people are among the groups at highest risk for the serious complications of influenza such as secondary bacterial pneumonia and exacerbations of coexisting chronic conditions, they should be among the persons given the highest priority for annual vaccination. Research indicates that 10-20% of the US population catches influenza per year, 200,000 people are hospitalized with complications of the disease and it is the cause of death in 35,000-50,000 people (8). About 85% of deaths and 63% of hospitalizations attributable to influenza occur in person's ≥65 years of age. About two-thirds of the US elderly have been vaccinated each year since 1997. Furthermore, observational studies of large cohorts have reported that elderly persons who elect to take the influenza vaccine were less likely to die or to be hospitalized during the influenza season than were unvaccinated elderly. Protection rates were estimated at 47% for all wintertime deaths and 22-27% for hospitalization (9). Unfortunately, our country does not have proper information on this issue.

Because of the characteristic of the influenza virus, it is possible to see an incidence of the disease in similar percentages in all countries. However, there is a vaccination against the disease that can have a significant role in its prevention. The most effective method of decreasing the effect of influenza is the vaccination of people at high risks every year (10). The absolute recommendation of vaccination in high risk groups which include those 65 years and older is gaining importance in decreasing the effect of influenza (11). The reported prevalence of influenza vaccination among community-dwelling elderly in some developed countries ranged from 51% to 78% (6,7). Efficacy and cost-effectiveness for the prevention of influenza in the elderly population have been documented (3,7). In Taiwan, influenza vaccination has been found to reduce hospital admissions and length of stay and results in savings in healthcare costs at least three times greater than the costs of vaccination (12).

In the region of Stockholm 100,245 people 65 years old and older were vaccinated in an influenza and pneumonia vaccination campaign. Within one year after the campaign, there was a decrease in incidence of influenza compared to those not vaccinated and a decrease in rate of death from cardiac insufficiency (13). Influenza vaccination in older persons living in long-term care facilities appears to prevent approximately 45 percent of pneumonia cases, hospital admissions, and influenza-related deaths. In older persons living in the community, influenza vaccination prevents about 25 percent of hospitalizations from influenza or respiratory illness (14).

A study conducted with 2383 individuals in Antalya during the 2005-2006 influenza season found that 55.7% of the research group knew and had heard about the influenza vaccine. However, only 15.0% had received the influenza vaccine. Therefore, the prevalence of the influenza vaccine in the elderly population of Antalya (15.0%) may be lower than that of the United States (60–80%) (15) and of Hong Kong (48.1%-31.2%) (2,7).

In a study conducted in Hong Kong with 877 individuals over 65 years old, 63.2% of the research participants had heard about vaccination and 31.2% had been vaccinated (2). In this study a correlation was found between knowing where to get vaccinated and the rate of vaccination. The low rate of vaccination in our study may be related to factors other than knowl-

edge of vaccination. In a similar study conducted with COPD patients, 44.2% of the patients knew about the influenza vaccine (16). Informing the over 65-year-old group about vaccination has gained great importance in having a less severe disease and in preventing its lethal complications (17).

In this study, 15% of the research group had been vaccinated against influenza. Considering the fact that 52.5% of the research group were members of three health insurance coverage plans, the expectation was that at least this level of immunization would be found but only 15% of the total group had received the vaccine. The point that needs to be emphasized here is that the public had not been adequately informed about the recent changes in the law which require social security health insurance institutions to pay for the influenza vaccine, so they paid for it themselves. The public needs to be informed about this situation to raise awareness on this subject.

On the other hand, in a study conducted in Botucatu, Brazil with 365 individuals over 60 years old, the vaccination rate was 63.2% (18). In a study conducted in Japan during the 2003-2004 influenza season with 2301 individuals over 65 years, the immunization rate was found to be 66.6% (19). In comparison with these percentages, the low rate of vaccination in Antalya is even more noteworthy.

In our study, as the educational level increased, the rate of vaccination against influenza significantly increased. A study by Ozol and Ozcakar ( 2005) about influenza immunization status in COPD patients found that the immunization rate increased with an increase in educational level (16).

In a study conducted in Germany, a correlation was identified between physicians' recommending influenza vaccination and high vaccination rates (20). It is natural to expect that physicians and other health care personnel would make recommendations to the public about getting vaccinated against influenza. However, in our study 33.3% of the participants were vaccinated because their children, grandchildren and other relatives recommended it. The physician's recommendation was second. A study conducted in Antalya in 2006 determined that 14.5% of 235 physicians in a hospital that provides health care unit to the public had been vaccinated against influenza (21). This situation shows that all health care personnel, particularly physicians, in Antalya need to be educated on the subject of being vaccinated against influenza. In the next phase, the importance of the efforts of health care personnel in increasing the distribution and coverage of influenza vaccine will gain significance.

This and other studies (7,18) pointed out that the involvement of community centers or health professionals were associated with influenza vaccine uptake. Peer influences may also encourage elderly people to receive influenza vaccine. Health care professionals are often seen as authoritative and a reliable source of information. The results show that family members' influence on the decision for receiving influenza vaccine is also significantly associated with some influenza vaccine outcomes. This has been documented by other studies (22). Promotion of influenza vaccine among elderly people should therefore involve families, community centers, and medical professionals.

Medical providers play a key role in vaccination of adults, and a recommendation from a physician is a strong predictor of vaccine receipt. Provider-based interventions effective in improving vaccine coverage have been identified and standards for adult vaccination practices have been promulgated (23). However, the majority of providers may not have adopted these standards (5).

Another issue related to this subject was that, while it was expected that vaccinations would be given in primary health care units, that is, the neighborhood primary health care units, this became the duty of pharmacies. People went directly to pharmacies without getting a prescription, requested the vaccine from the pharmacist who injected the vaccine to everyone who paid for the medication. The majority (69.5%) of the research participants paid for the vaccine themselves and the remaining was paid for by social health insurance institutions. However, community centers may provide influenza vaccine to the elderly at a lower cost.

In the last three months before the research, 12.9% of the patients who had been vaccinated against influenza stated that they had had influenza. This percentage was 32.5% for those who had not been vaccinated, which is a statistically significant difference. According to a study conducted at Gulhane Military Medical Academy in which a total of 814 students at the Health Non-Commissioned Officer Preparation School were given the influenza vaccine and comparative observations were made in periods before and after the vaccinations were given. It was observed that in the second observation period there was a difference that was statistically significant in the frequency of upper respiratory infections, number of people on sick leave, and total number of sick leave days and in the post vaccination period there was an improvement in these parameters (24).

As this research and other studies show, administering the influenza vaccine at the appropriate time in risk groups pro-

vides "cost-effective" results in the prevention of the disease (2,24).

This research revealed that women had vaccination more than men, well-educated participants had more vaccination than illiterate participants and primary school graduates, and people with health insurance had vaccination more than those without health insurance.

In summary, data obtained in this study about influenza vaccination was representative of Antalya. The over 65-year-old individuals were not adequately informed about the influenza vaccine, physicians did not make recommendations to this risk group to get the vaccination, vaccinations were given in pharmacies instead of primary health care units and individuals paid for the vaccinations themselves rather than social health insurance institutions. Health care personnel have important duties to resolve these negative findings.

In conclusion, education on the subject of the influenza vaccine needs to be given to physicians, nurses and midwives employed in primary health care units and to the public during home visits. Physicians need to recommend the influenza vaccine to patients at risk. Steps need to be taken to prevent the influenza vaccine from being given in pharmacies instead of public health centers. The cost of influenza vaccination is covered by health insurance institutions for individuals in risk groups. The public needs to be educated about this fact so that they can claim their rights and not pay for the vaccination themselves. The results are quite comparable with those obtained in other countries and some general features regarding factors predicting influenza vaccination among elderly people may therefore exist. Finally, program designers should be aware of the possibility that determinants of influenza vaccination behaviors may change over time.

### Study Limitations

The research was planned to reach 3000 individuals but fell short of the target. Some of the 617 individuals who were not reached did not want to be interviewed for the survey and some individuals were not at home. In addition, because the time was limited to only March, when the research had to be completed, it was not possible to go to these homes for a second time.

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