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Research Article

Chronic diseases in older people and influenza vaccination: the guidance of health professionals and the role of the media

Doenças crônicas em idosos e vacinação contra a influenza: orientação dos profissionais de saúde e o papel da mídia

Enfermedades crónicas em adultos mayores y vacunación contra la influenza: la orientación de los profesionales de la salud y el papel de los medios de comunicación

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Abstract

Introduction: Information on the presence of chronic diseases in older adults is not registered during influenza vaccination campaigns, which hinders its identification (proportion) in vaccinated older people. **Objective:** To describe the prevalence of self-reported chronic diseases in older people vaccinated against influenza; to verify the influence of the media in the decision to receive the vaccine; and if older adults received guidance on the importance of the vaccine, according to the type of health professional. **Methods:** This is a descriptive, cross-sectional study with data collected via interviews with older people vaccinated against influenza (n=798) in a Health Center of Campinas (state of São Paulo, Brazil) in 2019. **Results:** Most individuals were women (58.0%), with high school degree or higher education (53.0%), and with health insurance (72.3%). The most prevalent diseases were hypertension (56.9%; 95%CI 53.4-60.3), diabetes (24.7%; 95%CI 21.8-27.8), heart diseases (13.6%; 95%CI 11.4-16.2), and respiratory diseases (5.6%; 95%CI 4.2-7.5). A maioria (58,0%) considerou que a mídia influenciou sua decisão de tomar a vacina. The majority (58.0%) considered that the media influenced the decision to have the vaccine; 21.1% of the older adults received guidance on the importance of vaccination, mainly provided by physicians (67.4%), nurses (18.2%), and health workers (7.0%). **Conclusions:** The main diseases reported by the vaccinated older adults were hypertension, diabetes, heart diseases, and respiratory diseases. The guidance of health professionals was little reported, and most older people mentioned that the media influenced the decision to be vaccinated. The authors emphasize the need and relevance of investing in health communication strategies to inform the population about the importance of influenza vaccination for older adults and those with chronic diseases.

Keywords: Influenza vaccine; Health centers; Aged; Chronic disease; Epidemiology, descriptive.

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Resumo

Introdução: As informações sobre a presença de doenças crônicas nos idosos não são registradas durante as campanhas de vacinação contra influenza, o que dificulta sua identificação (proporção) nos idosos vacinados. **Objetivo:** Descrever a prevalência de doenças crônicas autorreferidas em idosos vacinados contra a influenza; verificar a influência da mídia na decisão de tomar a vacina; e se recebeu orientações sobre a importância dela, segundo o tipo de profissional de saúde. **Métodos:** Estudo transversal descritivo, com dados coletados por meio de entrevistas com idosos vacinados contra influenza (n=798) em um Centro de Saúde de Campinas (SP) em 2019. **Resultados:** Na amostra estudada, a maioria eram mulheres (58,0%), indivíduos com ensino médio completo ou ensino superior (53,0%) e com plano de saúde (72,3%). As doenças mais prevalentes foram hipertensão arterial (56,9%; intervalo de confiança — IC95% 53,4–60,3), diabetes (24,7%; IC95% 21,8–27,8), doenças cardíacas (13,6%; IC95% 11,4–16,2) e respiratórias (5,6%; IC95% 4,2–7,5). A maioria (58,0%) considerou que a mídia influenciou sua decisão de tomar a vacina. Receberam orientações sobre a importância da vacinação 21,1% dos idosos, fornecidas principalmente por médicos/as (67,4%), enfermeiros/as (18,2%) e agentes de saúde (7,0%). **Conclusões:** A investigação mostrou que as principais doenças referidas pelos idosos vacinados foram hipertensão arterial, diabetes, cardiopatias e doenças respiratórias. A orientação de profissionais da saúde foi pouco relatada pelos idosos e a maioria referiu influência da mídia na decisão de vacinar-se. Ressaltam-se a necessidade e a relevância de investir em estratégias de comunicação em saúde, a fim de esclarecer a população sobre a importância da vacinação contra a influenza para as pessoas idosas e com doenças crônicas.

Palavras-chave: Vacinas contra influenza; Centros de Saúde; Idoso; Doença crônica; Epidemiologia descritiva.

Resumen

Introducción: Información sobre la presencia de enfermedades en los adultos mayores no se registra durante las campañas de vacunación antigripal, lo que dificulta la identificación (proporción) en los adultos mayores. **Objetivo:** Describir la prevalencia de enfermedades crónicas en adultos mayores vacunados contra la influenza; verificar la influencia de los medios de comunicación en la decisión de vacunarse y; orientación sobre la importancia de la vacuna, según los profesionales de la salud. **Métodos:** Estudio descriptivo transversal con adultos mayores vacunados contra la influenza (n=798) en un Centro de Salud de Campinas/SP en 2019. **Resultados:** La mayoría era mujeres (58,0%), individuos con educación secundaria completa o superior (53,0%) y seguro de salud (72,3%). Las principales enfermedades fueron hipertensión arterial (56,9%; IC95% 53,4-60,3), diabetes (24,7%; IC95% 21,8-27,8), cardiopatías (13,6%; IC95% 11,4-16,2) y enfermedades respiratorias (5,6%; IC95% 4,2-7,5). La mayoría (58,0%) consideró que los medios de comunicación influyeron en la decisión de recibir la vacuna. El 21,1% de los adultos mayores recibió orientación sobre la importancia de la vacunación, proporcionada principalmente por médicos (67,4%), enfermeras (18,2%), agentes comunitarios de salud (7,0%). **Conclusiones:** La investigación ha demonstrado que las principales enfermedades reportadas fueron hipertensión, diabetes, enfermedades del corazón y respiratorias. La orientación de los profesionales de la salud fue poco mencionada y la mayoría refirió que los medios de comunicación influyeron en la decisión de vacunarse. Se enfatiza la necesidad y relevancia de invertir en estrategias de comunicación en salud con el fin de aclararle a la población sobre la importancia de la vacunación para los adultos mayores y las personas con enfermedades crónicas.

Palabras clave: Vacunas contra la influenza; Centros de salud; Aciano; Enfermedad crónica; Epidemiología descriptiva.

INTRODUCTION

Influenza, a respiratory disease of viral etiology and worldwide distribution, is responsible for thousands of deaths annually and has vaccination as the main public health measure for its prevention.[1] Although the burden of the disease is substantially based on respiratory manifestations, extrapulmonary outcomes constitute the burden of influenza that is not widely recognized.[2,3] Even though pneumonia (primary or secondary) is the most common complication, influenza can cause exacerbation of lung diseases (such as asthma and chronic obstructive pulmonary disease — COPD), metabolic (particularly diabetes), and cardiovascular diseases, it can trigger acute myocardial infarction (AMI) and cerebrovascular accident (CVA), among others.[1,3]

The Brazilian influenza vaccination strategy, carried out mainly within the scope of Primary Health Care (PHC), is directed to the groups most vulnerable to complications of the disease, such as older adults and people with chronic diseases,[3] and it has contributed to the reduction of morbidity and mortality in this subgroup.[4-8,9] It should be noted that, with the rapid aging of the Brazilian population, the prevalence of

chronic diseases tends to increase, and more than half of older adults have two or more chronic diseases, with hypertension being the most prevalent condition.[10] In addition, the presence of chronic diseases and the long-term use of some medications can affect the way the body reacts to the influenza infection, making it more susceptible to its severe types.[1,3,11]

According to the literature, in older adults and individuals with chronic diseases, vaccination reduces the risk of complications, hospitalizations, and deaths due to influenza[4,8-12] and, although the vaccine may be less effective in preventing the disease, it reduces its severity.[4] Even in view of recommendations[1,3] and the benefits for risk groups, many older people with specific chronic diseases still do not receive the vaccine. In 2013, it was estimated that 51.4% of the Brazilian population aged 60 years or older had hypertension; 18.2%, diabetes; 11.8%, heart diseases; 4.7%, CVA; 5.6%, cancer; 5%, asthma; 3.8%, lung diseases or COPD; and 2.7%, kidney failure, but the prevalence of influenza vaccination above the expected coverage (80%) was only observed in those with lung diseases or COPD.[13] The recommendation by health professionals and the media has been positively associated with vaccination, in addition to the presence of some diseases such as hypertension and diabetes.[14-19]

It is noteworthy that the National Immunization Program registers the doses of the vaccine administered to the group with comorbidities considering age groups, but this registration is limited up to 59 years of age,[3] which makes it difficult to identify the percentage of older people (≥ 60 years old) with specific chronic diseases vaccinated during the campaigns. In this context, research on the topic is justified. The present study aimed at describing the prevalence of self-reported chronic diseases in older people vaccinated against influenza; verifying the influence of the media in the decision to receive the vaccine; and if older adults received guidance on the importance of the vaccine, according to the type of health professional.

METHODS

This is a descriptive, cross-sectional study with primary data from older people vaccinated at Jardim Aurélia Health Center in Campinas (state of São Paulo, Brazil), in the 2019 national influenza vaccination campaign. This health center is part of the Norte de Campinas health district and was selected because it has, in its coverage area, one of the highest absolute numbers of older people in the municipality. In 2019, the population aged 60 years or older represented 18.7% of the total population of the coverage area (7,240 older adults).[20]

The period of the vaccination campaign in the city of Campinas followed the national recommendation and, between April 10 and 20, children (aged from six months to <6 years), pregnant women, and puerperal women were mobilized for vaccination. Between April 22 and May 31, all priority groups were mobilized, including older people and individuals with chronic diseases and other special clinical conditions (to prove the recommendation for having the vaccine in this subgroup, a medical prescription or prescription of drugs in use were accepted).[21]

This study included a sample of older adults vaccinated at the Jardim Aurélia Health Center, and the inclusion criteria were aging 60 years or older and living in the city of Campinas, regardless of the neighborhood of residence. The exclusion criteria were age ≤59 years, living in other municipalities, and the presence of conditions or diseases (for example, mental disorders) that prevented the participation of the older adult. Older people who did not want to sign the Informed Consent Form were considered refusals.

The minimum number expected to compose the sample (784 older adults) was estimated considering the situation corresponding to the maximum variability for the frequency of the studied event (p=0.50), with a 95% confidence level (z=1.96), and establishing a sampling error of 3.5 percentage points (d=0.035). At the end of the study, 798 valid interviews were conducted, resulting in a small reduction of the sampling error to 3.47%.

Data collection took place between April 22 and May 4, 2019, through face-to-face interviews with the older adults (who could be assisted by their guardian), based on a structured questionnaire with objective questions. The interviewers (graduate students with experience in field research) were previously trained to apply the instrument, performing simulations and solving doubts with the supervisor, through three meetings in person. A pilot survey was also conducted with 18 older people not included in this study, aiming to assess the clarity and comprehensiveness of the instrument's questions, correct any problems, and adapt the language for better understanding.

First, a meeting was held with the coordinator and the health center teams to present the research and develop strategies for its promotion and development. The research was promoted by the health professionals of the unit themselves, including community health workers, and by the researchers, during the campaign. Older adults were approached on the premises of the health center (in the line or waiting room after receiving the vaccination), according to the availability of the interviewers, and were invited to participate in the research. The interviews took place after the informed consent form was read and signed by the participants.

Data on the following study variables were collected:

a) *sociodemographic*: resident in the area covered by the health center (yes; no), sex (men, women), age group (60—64, 65—69, ≥70 years old), race/skin color (white, nonwhite — black/mixed-race/Asian), marital status (single, married/common-law marriage, separated/divorced, widowed), education level (without formal education/some elementary school, elementary school/high school, some college/college degree), income in minimum wages (BRL 1,039.00, categorized as ≤1, 1—2, 3—4, ≥5), retirement, and health insurance (yes; no).

b) *chronic diseases:* self-reported information obtained as follows: "The following questions are about some diseases, I will mention them and I ask you to please answer which of them has a physician diagnosed you with (yes or no): hypertension, diabetes mellitus, heart diseases (AMI, heart failure, atherosclerosis, angina, or others), respiratory diseases (pulmonary emphysema, chronic bronchitis, or COPD, asthma or asthmatic bronchitis, cystic fibrosis, pulmonary arterial hypertension, bronchopulmonary dysplasia, or others), kidney disorders (patient on dialysis/hemodialysis, nephrotic syndrome, or others), liver disease (cirrhosis, chronic hepatitis, biliary atresia), CVA, and other diseases or health conditions such as: autoimmune diseases (lupus, multiple sclerosis, rheumatoid arthritis, spondyloarthritis, others), cancer, grade III obesity, transplant recipients (solid organs or bone marrow), and human immunodeficiency virus (HIV/AIDS)." In order to minimize possible information bias regarding diseases, the use of medications for the treatment of these conditions was also questioned;

c) *vaccination:* if individuals were vaccinated against influenza in 2017 and 2018 (self-reported information and verified on the vaccination card when available); and if individuals received guidance from health professionals on the importance of the vaccine (yes or no) and, if so, the type of professional (the older adult could refer to guidance from more than one health professional). The influence of the media was verified by the question: "Did advertisements with information about the influenza vaccination campaign (which are broadcasted on the radio, television, and other media) help/influence your decision to have the vaccine?" (yes or no).

Descriptive statistical analysis of the data was performed based on the distribution of absolute and relative frequencies of the studied variables and their 95% confidence intervals (95%CI) using the Stata® program (version 14.0, StataCorp LP, College Station, United States of America) and Microsoft Excel® 2013.

The project was approved by the Research Ethics Committee of the School of Medical Sciences, Universidade Estadual de Campinas (opinion No. 2.783.855, dated July 24, 2018). The anonymized data of the participants were accessed only by the team for research purposes, and the interviewees did not participate in the planning or design of the study.

RESULTS

A total of 798 older adults participated in the study; the recruitment and inclusion process is demonstrated in Figure 1. To reach the number of participants for the estimated sample, it was necessary to invite 862 vaccinated older adults to the study, considering that 48 (5.6%) refused to participate and 13 (1.5%) did not live in Campinas. In addition, three questionnaires were not fully answered and, therefore, were disregarded.

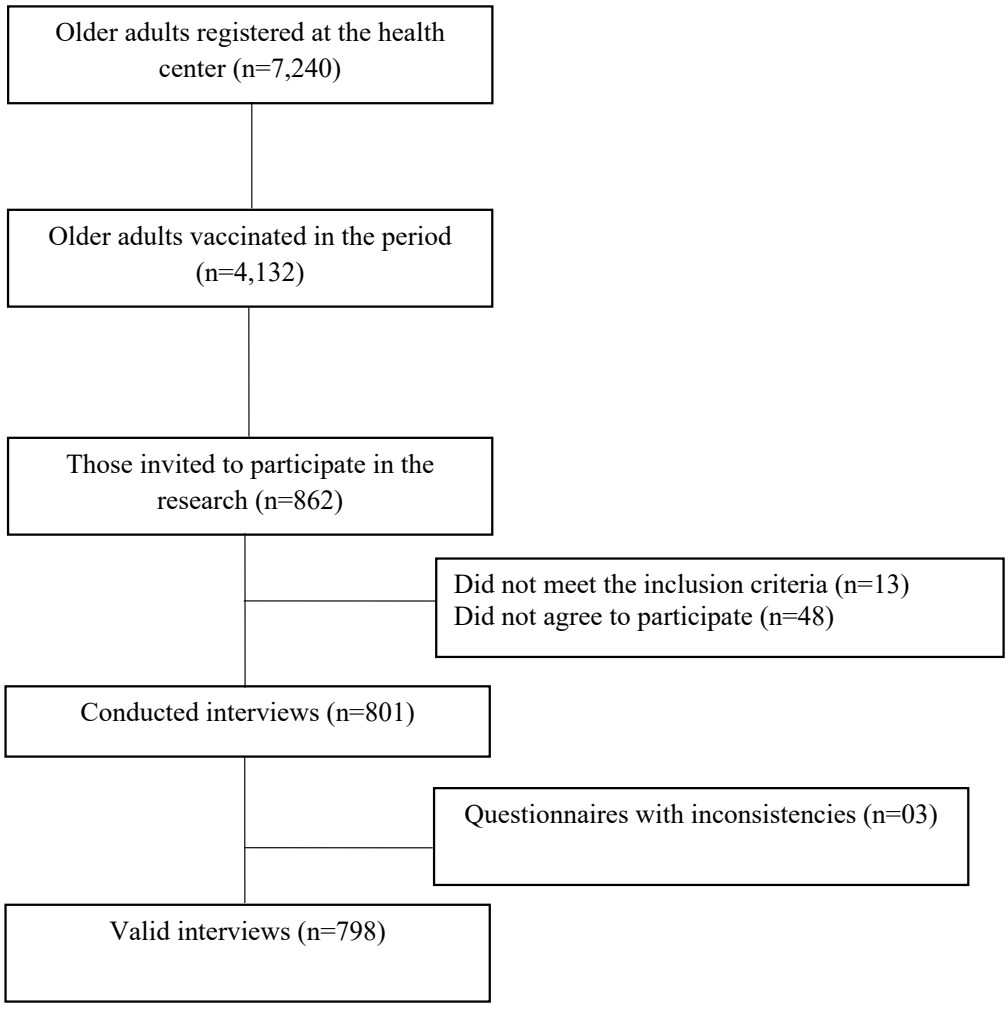


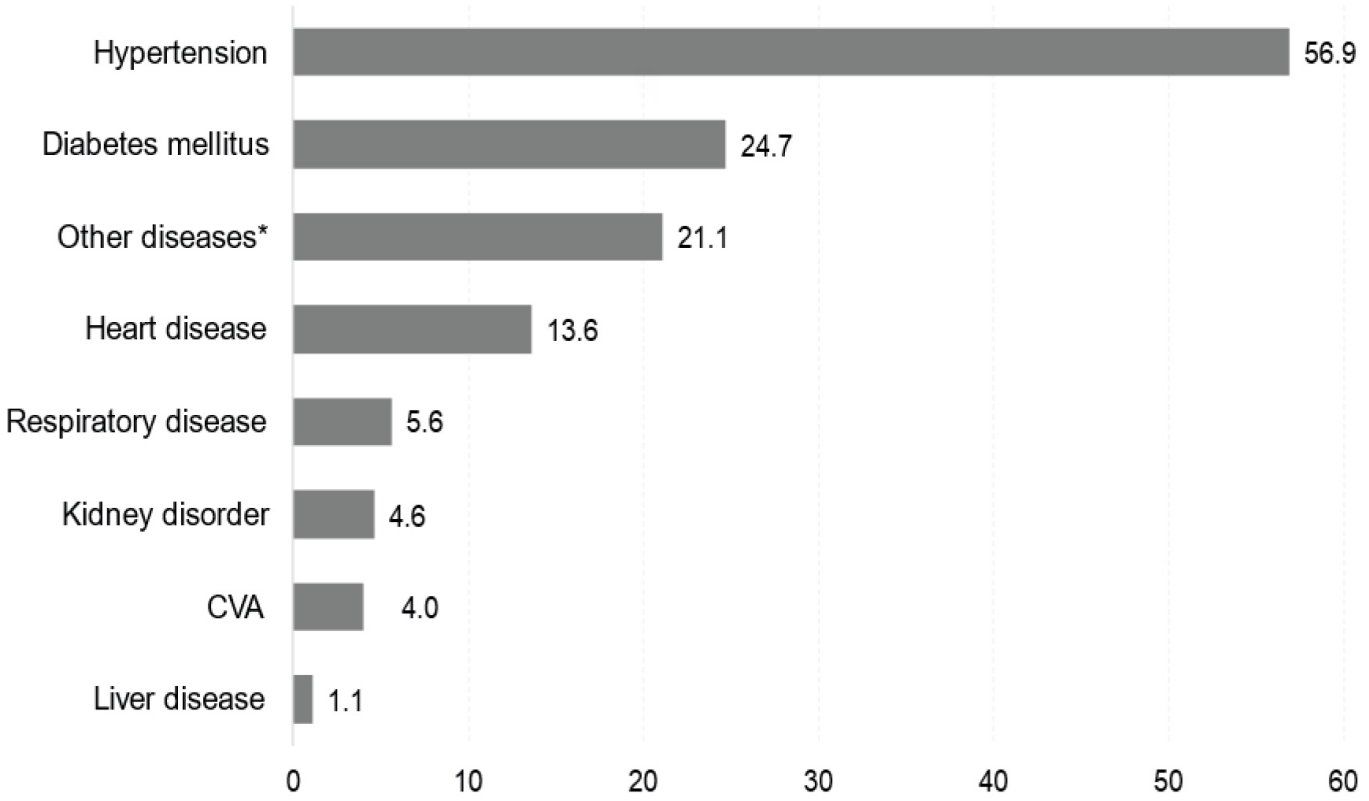
Figure 1. Individuals' recruitment process and inclusion in the study.

Among the participants, 79.7% lived in the coverage area of the Jardim Aurélia Health Center. The mean age was 72.0 years (standard deviation = 8.1), and most were women (58.0%) and aged ≥70 years (56.4%), of which: 19.3% were 80 years old or older; 76.2% self-reported to be white; 61.8 were married/had a common-law marriage; 81.8% were retired; 53% had higher education level (high school or college degree); 53.4% had an income of ≥3 minimum wages; and 72.3% had health insurance (Table 1).

Table 1. Sociodemographic characteristics and those related to influenza vaccination in older adults. Jardim Aurélia Health Center, Campinas (SP), 2019 (n=798).

Variables	Absolute frequency (n)	Relative frequency (%)	Confidence interval (95%CI)
Resident in the area covered by the health center			
Yes	636	79.7	76.7–82.3
No	162	20.3	17.6–23.2
Sex			
Men	335	42.0	38.5–45.4
Women	463	58.0	54.5–61.4
Age group (years)			
60–64	150	18.8	16.2–21.7
65–69	198	24.8	21.9–27.9
70 or older	450	56.4	52.9–59.8
Race/skin color			
White	606	76.2	73.1–79.1
Nonwhite	189	23.8	20.9–26.9
Marital status			
Single	56	7.0	5.4–9.0
Married/Common-law marriage	493	61.8	58.3–65.1
Separated/Divorced	66	8.3	6.5–10.4
Widowed	183	22.9	20.1–25.9
Education level			
Some elementary school	212	26.6	23.6–29.7
High school	312	39.1	35.7–42.5
Some college/College degree	274	34.3	31.1–37.7
Retirement			
Yes	653	81.8	78.9–84.3
No	145	18.2	15.6–21.0
Income (in minimum wages)			
<1	82	10.3	8.4–12.6
1–2	288	36.3	32.9–39.6
3–4	251	31.6	28.5–34.9
≥5	173	21.8	19.0–24.8
Health insurance			
Yes	577	72.3	69.1–75.3
No	221	27.7	24.7–30.9
Advertisements/Media influenced the decision to be vaccinated			
Yes	462	58.0	54.4–61.3
No	335	42.0	38.6–45.4
Received guidance on the importance of vaccination			
Yes	168	21.1	18.4–24.1
No	628	78.9	75.9–81.6

The main chronic diseases reported by the vaccinated older adults were hypertension (56.9%; 95%CI 53.4—60.3), diabetes mellitus (24.7%; 95%CI 21.8—27.8), heart diseases (13.6%; 95%CI 11.4—16.2), and respiratory diseases (5.6%; 95%CI 4.2—7.5) (Figure 2).



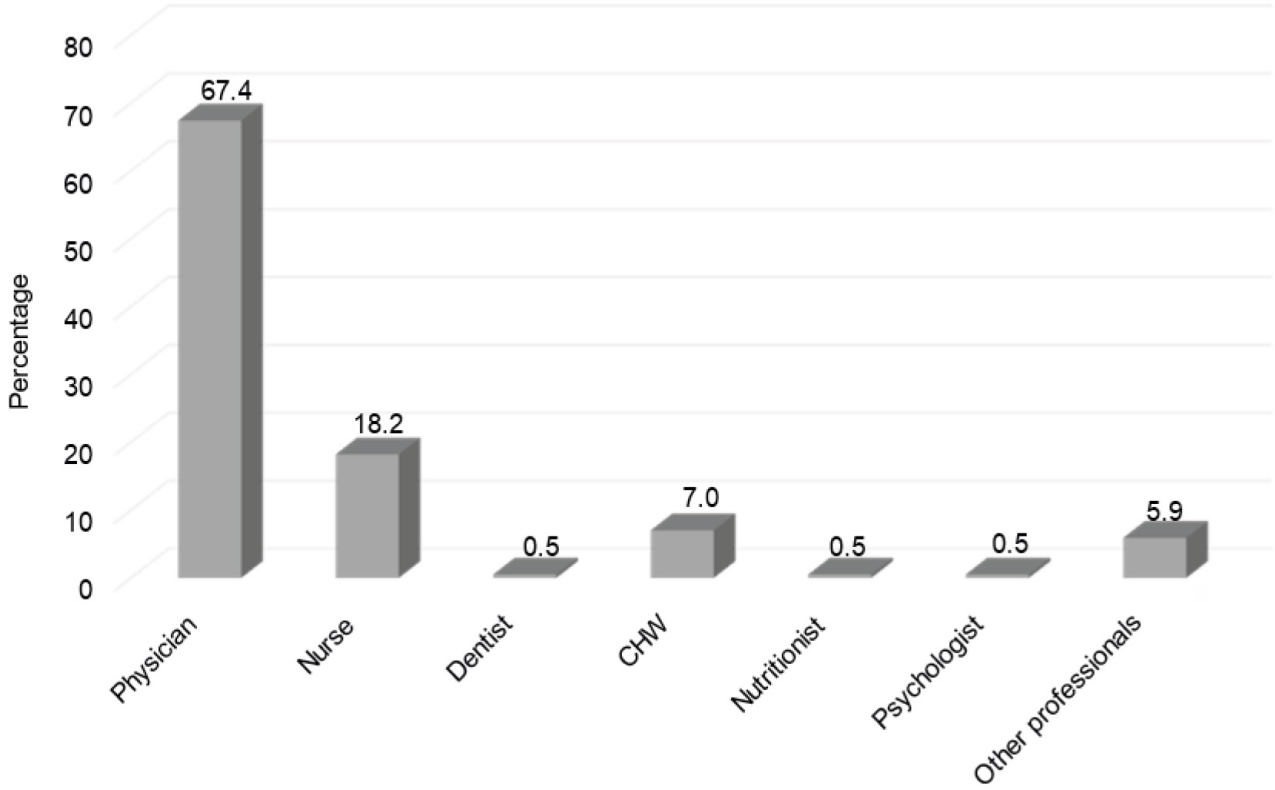
CVA: cerebrovascular accident. *Other diseases: autoimmune diseases (lupus, multiple sclerosis, rheumatoid arthritis, spondyloarthritis, or other); cancer, grade III obesity, transplant recipients (solid organ or bone marrow), and human immunodeficiency virus (HIV/AIDS).

Figure 2. Prevalence of chronic diseases in older adults vaccinated at the Jardim Aurélia Health Center. Campinas (SP), 2019.

Among the heart diseases reported, 39.8% mentioned heart failure; 26.4%, AMI; 17.0%, atherosclerosis; and 13.3%, angina. In the subgroup of respiratory diseases, asthma and COPD (pulmonary emphysema, chronic bronchitis) were the conditions most reported by the older adults, with 73.3 and 20.5%, respectively.

Regarding the previous vaccination, 95.8 and 96.3% were vaccinated in 2017 and 2018, respectively. Most older people (58.0%) considered advertisements with information about influenza vaccination campaigns relevant to vaccination and emphasized the importance of the media to remember the date of the beginning of the campaigns (Table 1).

As for the guidance of health professionals on influenza vaccination, 78.9% reported not having received any guidance. As for those who received guidance (only 21.1%), the most cited professionals were: physicians (67.4%), nurses (18.2%), and community health workers (7.0%) (Figure 3).



CHW: community health worker. Note: The older adult could refer to the guidance of more than one health professional.
Figure 3. Health professionals who provided guidance to the older adults about the importance of influenza vaccination. Jardim Aurelia Health Center. Campinas (SP), 2019.

DISCUSSION

The most prevalent chronic diseases among the older adults vaccinated against influenza at the Jardim Aurélia Health Center in Campinas were systemic hypertension, diabetes mellitus, heart diseases (heart failure, AMI, and atherosclerosis), and respiratory diseases.

Regarding the profile of the vaccinated older people, there was similarity with the findings of other studies concerning the representation of the main chronic conditions. In Botucatu (state of São Paulo, Brazil), a survey on factors associated with vaccination identified hypertension, diabetes, and cardiovascular diseases as the most frequent conditions in 365 older people in 2003.[22] A study on knowledge of and adherence to influenza vaccination, carried out with 700 individuals (adults and older people) in Italy, found that the most prevalent chronic diseases were diabetes, cardiovascular diseases, and respiratory diseases.[23]

Considering the proportions of chronic diseases, the results of this research should be carefully interpreted, considering that the sample was selected in a health center, which does not guarantee its representativeness for the entire municipality – particularly regarding the sociodemographic characteristics of older adults residents of Campinas. In this sense, direct comparisons with the prevalence of some diseases reported in the literature for the Brazilian population of older adults[13,24,25] and for the municipality of Campinas[26,27] may not be appropriate. The prevalence of hypertension observed in older people, for instance, is greater than 50% both in Brazil[13,24] and in Campinas.[26]

In this study, most of the vaccinated older adults had health insurance, which is rarely verified for this age group,[18,19,28], as well as higher levels of education[16,18,19,27] and income.[16,27] Studies indicate that the presence of chronic diseases and higher education (which is a proxy for income)[28] have been associated with greater use of healthcare services.[28,29] Regarding the other characteristics, studies carried out on older people from Campinas also identified that the majority had a partner/spouse and were white and retired.[16,27,30]

The predominance of women has been reported in research on influenza vaccination[4,13,19,31] and older people.[16,25-30] This can be partially explained by the fact that women have a higher prevalence of multimorbidity compared with men and use healthcare services more often,[25] becoming more exposed to health promotion initiatives. It is also worth considering the survival bias, as men have shorter life expectancy.[32] Napolitano *et al*.[31] observed that men were less likely to present knowledge, positive attitudes, and adherence to the recommended vaccines for people with chronic diseases.

Since the beginning of the campaigns, the youngest population of older adults has been the least adherent to vaccination. A population-based study (2008—2009), which included 1,517 noninstitutionalized older people in Campinas, identified a higher prevalence of vaccination in those aged ≥70 years.[16] Several factors may be related to the adherence of this subgroup to vaccination; for example, it is known that the number of diseases increases with age[25] and, usually, younger older adults have a better perception of their health status in relation to the oldest ones.

The high percentage of those vaccinated against influenza in 2017 and 2018 shows that the older adults vaccinated in 2019 have attended the latest campaigns. The present study did not collect data on the site of the previous vaccination to verify whether, in this population, the public service is the most used to receive the vaccine.[4] However, in Campinas, 98.0% of older people used the public service for vaccination in previous research.[16]

The media was pointed out by the older adults as an important way to remember the beginning and period of the influenza vaccination campaigns. The media can be used for purposes beyond the promotion of the period of the campaigns and their target audience, such as to disseminate information to the population about the importance of vaccination for patients with chronic diseases and on aspects related to the vaccine (benefits, effective protection, possible adverse effects, among others). Furthermore, obtaining information through the mass media has been related to the increased chance of positive attitudes towards vaccination by individuals with chronic diseases.[31]

Studies indicate that the recommendation of health professionals is an important factor for adherence to vaccination[14-16,31] and should be encouraged especially considering chronic diseases. In this study, the guidance of these professionals about the vaccine was observed by the reports of just over a quarter of the older adults, which showed that the attendance of this population to vaccination campaigns is also influenced by other factors.

Currently, physicians, including specialists, play a key role in the discussion and recommendation of vaccines. Older adults with chronic diseases usually have a relationship of trust with these professionals, and doctor's appointments could provide opportunities for approaching immuno-prevention. A study identified that individuals who received information from doctors were more likely to present positive attitudes towards vaccination compared with those who did not receive it.[31]

It should be noted that PHC is the most strategic level of health care for actions to prevent diseases and impairments. Thus, from the perspective of controlling and eliminating vaccine-preventable diseases, which includes vaccination initiatives, the active participation of health professionals, as well as health

managers, is essential in the development of innovative and more effective strategies for vaccination.[33] The continuing education of health professionals and managers, aimed at the attributes of PHC and the needs of the population, can benefit the quality of care and collective actions — even to overcome the fragmentation and incompleteness of clinical practices and the promotion of health, which challenge the quality and comprehensiveness of care in PHC.[34]

Some study limitations should be considered, such as the recruitment of older people in a specific health center, which does not allow extrapolating the findings to all the older adults in the municipality, and which may also have included those who more frequently use the health center. All information was self-reported; it is noteworthy that the validity of the self-reported responses may vary for some specific diseases.[24,35] Nevertheless, among older people, self-reported information about some diseases, such as hypertension, diabetes, and heart diseases, has been correlated with that of medical records and exams.[36]

CONCLUSION

The results of the present study showed that the main diseases reported by the vaccinated older people were hypertension, diabetes mellitus, and heart diseases. Few older adults reported having received guidance from health professionals regarding vaccination, and the majority reported that the media influenced the decision to be vaccinated. In addition to the attributes of PHC regarding the provision of specific protection and disease prevention actions, the need for health communication is highlighted, seeking to clarify users about the importance of influenza vaccination as a prevention strategy, particularly in individuals with chronic conditions.

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CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

AGMB: Conceptualization, Data curation, Writing – original draft, Writing – review & editing, Investigation, Methodology. PMSB: Project administration, Formal analysis, Conceptualization, Writing – review & editing, Methodology, Supervision, Validation, Visualization.

REFERENCES

1. World Health Organization. Influenza (seasonal). Fact sheet nº 211 [Internet]. Genebra: World Health Organization Website; 2018 [cited on Mar. 23, 2018]. Available at: http://www.who.int/mediacentre/factsheets/fs211/en/
2. Sellers SA, Hagan RS, Hayden FG, Fischer WA 2nd. The hidden burden of influenza: A review of the extra-pulmonary complications of influenza infection. Influenza Other Respir Viruses 2017;11(5):372-93. https://dx.doi.org/10.1111/irv.12470
3. Coordenação Geral do Programa Nacional de Imunizações, Departamento de Vigilância Epidemiológica, Secretaria de Vigilância em Saúde, Ministério da Saúde. Campanha Nacional de Vacinação Contra a Influenza: informe técnico. 21ª ed. Brasília: Ministério da Saúde; 2019.
4. Prass L, Menezes HS, Abegg MP, Gomes MB, Souza WC, Cirino SLMB. Efetividade da vacina contra influenza em idosos em Porto Alegre. Rev AMRIGS 2010;54(4):388-92.
5. Mansur AP, Favarato D, Ramires JAF. Vacina contra o vírus da influenza e mortalidade por doenças cardiovasculares na cidade de São Paulo. Arq Bras Cardiol 2009;93(4):395-99. https://dx.doi.org/10.1590/S0066-782X2009001000013
6. Francisco PMSB, Donalisio MR, Lattorre MRDO. Impacto da vacinação contra influenza na mortalidade por doenças respiratórias em idosos. Rev Saúde Pública 2005;39:75-81. https://dx.doi.org/10.1590/S0034-89102005000100010
7. Francisco PMSB, Donalisio MR, Lattorre MRDO. Internações por doenças respiratórias em idosos e a intervenção vacinal contra influenza no estado de São Paulo. Rev Bras Epidemiol 2004;7:220-27. https://dx.doi.org/10.1590/S1415-790X2004000200011
8. Luna EJA, Gattás VL. Effectiveness of the Brazilian influenza vaccination policy, a systematic review. Rev Inst Med trop S Paulo 2010;52(4):175-81. http://dx.doi.org/10.1590/S0036-46652010000400002
9. Zangiabadian M, Nejadghaderi SA, Mirsaeidi M, Hajikhani B, Goudarzi M, Goudarzi H, et al. Protective effect of influenza vaccination on cardiovascular diseases: a systematic review and meta-analysis. Sci Rep 2020;10(1):20656. https://doi.org/10.1038/s41598-020-77679-7
10. Carvalho JN, Roncalli ÂG, Cancela MC, Souza DL. Prevalence of multimorbidity in the Brazilian adult population according to socioeconomic and demographic characteristics. PloS One 2017;12(4):e0174322. https://doi.org/10.1371/journal.pone.0174322
11. Agarwal D, Schmader KE, Kossenkov AV, Doyle S, Kurupati R, Ertl HCJ. Immune response to influenza vaccination in the elderly is altered by chronic medication use. Immunity & Ageing 2018;15(19):1-13. https://doi.org/10.1186/s12979-018-0124-9
12. Machado A, Kislaya I, Larrauri A, Dias CM, Nunes B. Impact of national influenza vaccination strategy in severe influenza outcomes among the high-risk Portuguese population. BMC Public Health 2019;19:1690. https://doi.org/10.1186/s12889-019-7958-8
13. Bacurau AGM, Francisco PMSB. Prevalência de vacinação contra a influenza em idosos brasileiros com doenças crônicas. Cad Saúde Pública 2019;35(4):e00230518. https://doi.org/10.1590/0102-311x00230518
14. Egici MT, Taş BG, Özkarafakılı MA, Öztürk GZ. Evaluation of Factors Affecting Adult Immunization. Haydarpasa Numune Med J 2018;58(3):128-32. https://doi.org/10.14744/hnhj.2018.34713
15. Pandolfi E, Marino MG, Carloni E, Romano M, Gesualdo F, Borgia P, et al. The effect of physician's recommendation on seasonal influenza immunization in children with chronic diseases. BMC Public Health 2012;12:984. https://doi.org/10.1186/1471-2458-12-984
16. Francisco PMSB, Barros MBA, Cordeiro MRD. Vacinação contra influenza em idosos: prevalência, fatores associados e motivos da não-adesão em Campinas, São Paulo, Brasil. Cad Saúde Pública 2011;27(3):417-26. http://dx.doi.org/10.1590/S0102-311X2011000300003
17. Moura RF, Andrade FB, Duarte YAO, Lebrão ML, Antunes JLF. Fatores associados à adesão à vacinação anti-influenza em idosos não institucionalizados, São Paulo, Brasil. Cad Saúde Pública 2015;31(10):2157-68. https://dx.doi.org/10.1590/0102-311X00065414
18. Sato APS, Antunes JLF, Lima-Costa MFF, Andrade FB. Influenza vaccine uptake among older adults in Brazil: Socioeconomic equality and the role of preventive policies and public services. J Infect Public Health 2019;19:1152. https://doi.org/10.1016/j.jiph.2019.07.022
19. Andrade FB, Sato APS, Moura RF, Antunes JLF. Correlates of influenza vaccine uptake among community-dwelling older adults in Brazil. Human Vaccin Immunother 2017;13(1):103-10. https://doi.org/10.1080/21645515.2016.1228501
20. Secretaria Municipal de Saúde de Campinas (SP). Coordenadoria de informação e informática. Sistema de informação TabNet. População por Faixa Etária e Sexo das Áreas de Abrangência dos CS e Distritos de Saúde, 2000-2018. [Internet]. [cited on Dec. 09, 2019]. Available at: http://tabnet.campinas.sp.gov.br/dh?populacao/pop3.def
21. Prefeitura Municipal de Campinas (SP). Secretaria Municipal de Saúde de Campinas. Departamento de Vigilância em Saúde. Campanha Nacional de Vacinação contra a Influenza 2019. [Internet]. [cited on Feb. 25, 2021] Available at: http://www.saude.campinas.sp.gov.br/saude/eventos/eventos_2019/campanha_influenza_2019/campanha_influenza_2019_orientacoes.pdf
22. Donalisio MR, Ruiz T, Cordeiro R. Fatores associados à vacinação contra influenza em idosos em município do Sudeste do Brasil. Rev Saúde Pública 2006;40(1):115-9. https://dx.doi.org/10.1590/S0034-89102006000100018
23. Bertoldo G, Pesce A, Pepe A, Pelullo CP, Di Giuseppe G, The Collaborative Working Group. Seasonal influenza: Knowledge, attitude and vaccine uptake among adults with chronic conditions in Italy. PLoS One 2019;14(5):e0215978. https://dx.doi.org/10.1371/journal.pone.0215978

24. Malta DC, Gonçalves RPF, Machado IE, Freitas MIF, Azeredo C, Szwarcwald CL. Prevalência da hipertensão arterial segundo diferentes critérios diagnósticos, Pesquisa Nacional de Saúde. Rev bras epidemiol 2018;21(Suppl1):e180021. http://dx.doi.org/10.1590/1980-549720180021.supl.1
25. Nunes BP, Batista SRR, Andrade FB, Souza Junior PRB, Lima-Costa MF, Facchini LA. Multimorbidade em indivíduos com 50 anos ou mais de idade: ELSI-Brasil. Rev Saúde Pública 2018;52(Suppl 2):10s. https://dx.doi.org/10.11606/s1518-8787.2018052000637
26. Paiva MM. Quedas, condições de saúde e qualidade de vida em idosos: estudo de base populacional de Campinas, São Paulo [tese]. Campinas: Universidade Estadual de Campinas; 2019.
27. Prado MAMB, Francisco PMSB, Barros MBA. Diabetes em idosos: uso de medicamentos e risco de interação medicamentosa. Ciênc Saúde Coletiva 2016;21(11):3447-58. https://dx.doi.org/10.1590/1413-812320152111.24462015
28. Malta DC, Stopa SR, Pereira CA, Szwarcwald CL, Oliveira M, Reis AC. Cobertura de Planos de Saúde na população brasileira, segundo a Pesquisa Nacional de Saúde, 2013. Ciênc saúde coletiva 2017;22(1):179-90. https://dx.doi.org/10.1590/1413-81232017221.16782015
29. Malta DC, Bernal RTI, Lima MG, Araújo SSC, Silva MMA, Freitas MIF, et al. Doenças crônicas não transmissíveis e a utilização de serviços de saúde: análise da Pesquisa Nacional de Saúde no Brasil. Rev Saúde Pública 2017;51(Suppl 1):4s.
30. Sousa NFS, Lima MG, Cesar CLG, Barros MBA. Envelhecimento ativo: prevalência e diferenças de gênero e idade em estudo de base populacional. Cad Saúde Pública 2018;34(11):e00173317. https://dx.doi.org/10.1590/0102-311x00173317
31. Napolitano F, Della Polla G, Capano MS, Augimeri M, Angelillo IF. Vaccinations and Chronic Diseases: Knowledge, Attitudes, and Self-Reported Adherence among Patients in Italy. Vaccines (Basel) 2020;8(4):560. https://doi.org/10.3390/vaccines8040560
32. Camargos MCS, Gonzaga MR, Costa JV, Bomfim WC. Estimativas de expectativa de vida livre de incapacidade funcional para Brasil e Grandes Regiões, 1998 e 2013. Ciênc Saúde Colet 2019;24(3):737-47. http://dx.doi.org/10.1590/1413-81232018243.07612017
33. Souza PA, Gandra B, Chaves ACC. Experiências sobre imunização e o papel da Atenção Primária à Saúde. APS Rev 2020;2(3):267-71. https://doi.org/10.14295/aps.v2i3.57
34. Facchini LA, Tomasi E, Dilélio AS. Qualidade da Atenção Primária à Saúde no Brasil: avanços, desafios e perspectivas. Saúde Debate 2018;42(spe1):208-23. https://doi.org/10.1590/0103-11042018S114
35. Gonçalves VSS, Andrade KRC, Carvalho KMB, Silva MT, Pereira MG, Galvao TF. Accuracy of self-reported hypertension: a systematic review and meta-analysis. J Hypertens 2018;36(5):970-78. https://dx.doi.org/10.1097/HJH.0000000000001648
36. Galenkamp H, Huisman M, Braam AW, Schellevis FG, Deeg DJ. Disease prevalence based on older people's self-reports increased, but patient-general practitioner agreement remained stable, 1992-2009. J Clin Epidemiol 2014;67(7):773-80. https://dx.doi.org/10.1016/j.jclinepi.2014.02.002