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WILLINGNESS TO RECEIVE COVID-19 VACCINATION IN COSTUMERS ACCESSING COMMUNITY PHARMACIES IN THE PROVINCE OF PALERMO, ITALY.

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ABSTRACT

In Italy, vaccination against COVID-19 began on December 27, 2020. To date, 13,713,224 people in Italy are fully vaccinated, which accounts for 25.3 % of the general population, and 44.8% received at least one vaccination dose. The present study aim to investigate willingness to receive COVID-19 vaccination in costumers accessing a sample of community pharmacies in the Province of Palermo, Italy. A self-administered and anonymous questionnaire was carried out among costumers older than 18 years old between December 2020 and March 2021. Three hundred and sixty-three subjects were enrolled in the study, 259 (71.3%) expressed their willingness to receive COVID-19 vaccination. The main determinants associated with vaccination acceptance resulted "trust in safety and effectiveness of vaccinations" and the absence of any previous negative vaccination experience. Unfavourable information on COVID-19 vaccination obtained through internet/media/social media and lack of confidence in COVID-19 vaccines and in the Italian national healthcare system are the main determinants associated with vaccine refusal. Male gender, younger age classes and influenza vaccination acceptance due to the impact of COVID pandemic were significantly associated with willingness to be vaccinated against COVID-19. In order to promote COVID-19 vaccination campaign accurate, informative and communicative campaign dedicated to subjects that are more hesitant regarding COVID-19 vaccination (e.g. female sex, adults, people that usually do not adhere to influenza vaccination campaign) should be implemented.

1. Introduction

Coronaviruses (CoV) are a large family of respiratory viruses that can cause mild to moderate illnesses, ranging from the common cold to respiratory syndromes such as MERS (Middle East Respiratory Syndrome) and SARS (Severe Acute Respiratory Syndrome) [1].
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the causative agent of the current COVID-19 global pandemic, proclaimed a public health emergency of global concern by the World Health Organization (WHO) in March 2020 [2].

This contagion initially emerged in Wuhan City, Hubei Province, China on December 8, 2019, which caused pneumonia-like symptoms in a cluster of patients and rapidly the pandemic spread to several countries worldwide [3,4].
To date, since the beginning of the pandemic, there have been 168,040,871 cases of coronavirus infection confirmed in the world and 3,494,758 deaths [5].
In Europe 54,135,808 confirmed cases and 1,144,974 deaths have been reported to date [5, 6].

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With the approval of the first vaccine against COVID-19 by US and European health regulatory authorities and its spread on a global scale, a significant decrease in cases and deaths was highlighted in the countries where vaccination reached high coverage rates [7, 8]. Worldwide, to date, over 2 billion doses of vaccine have been administered, 36,012,012 of which in Italy [5].

In Italy, vaccination against COVID-19 began on December 27, 2020 for HCWs and all personnel working in healthcare settings [9, 10]. From February, the vaccination campaign was extended to the elderly over 80 years old and people living in long-term care facilities [10]. To date, 13,713,224 people in Italy are fully vaccinated, which accounts for 25.3 % of the general population, and 44.8% received at least one vaccination dose [11].

In March 2021, COVID-19 vaccination was offered to people with severe comorbidities and those vulnerable at any age (from 16 to 79 years old), in parallel with school and university teaching and administrative staff [12]. Finally, starting from April, access to vaccination was extended to those over 60 years old and from May/June the possibility of vaccination has been progressively extended to all citizens over 16 years old [11].

In the present study, we aim to investigate willingness to receive COVID-19 vaccination in costumers accessing a sample of community pharmacies in the Province of Palermo, Italy, particularly focusing on the determinants that could play a role in acceptance, hesitation or refusal.

2. Material and methods

A pilot project in collaboration between the Department of Biomedical and Neuromotor Sciences of the University of Bologna and the Department of Health Promotion Sciences, Maternal and Infant Care, Internal Medicine and Medical Specialties (PROMISE) of the University of Palermo, was conducted in the fourth most populous Italian city, Palermo, with the main objective to evaluate willingness and attitudes of the general population regarding COVID-19 vaccination acceptance.

Sicily is a southern Italian region with about five million inhabitants and is fourth for demographic density in Italy [13]. Among the 9 Local Health Agencies (LHAs) covering the Sicilian territory, the province of Palermo and the corresponding LHA, accounting for 1,252,588 inhabitants residing in 82 municipalities, is the most populous in the region [13].

A self-administered and anonymous questionnaire was carried out among costumers older than 18 years old with access to five community pharmacies located in the Municipality and in the Province of Palermo, Italy [14]. The study was conducted between December 2020 and March 2021 in order to investigate the Vaccine Hesitancy (VH) among the general population with a particular focus on COVID-19 vaccination.

The questionnaire included 8 multiple choice and open-ended questions and it was divided in the following sections:

- socio-demographic characteristics: sex, age, residence, educational level;
- attitude of the subjects interviewed to get vaccinated against SARS-CoV-2, considering main factors, divided in social and individual determinants, associated with adherence of refusal, among those identified after a review of the available literature about VH, in general and with specific regard to the COVID-19 pandemic;
- attitude of respondents towards seasonal 2020/2021 flu vaccination, in order to evaluate the possible correlation with SARS-CoV-2 vaccination.

Data were collected and analysed in accordance with articles 13-14 of EU regulation GDPR 2016/679 for the protection of individuals regarding the processing of personal data. Data collected through the questionnaire were entered into a database created with EpiInfo 3.5.4 (Centers for Disease Control and Prevention, Atlanta, GA, USA) and then analyzed using the statistical software package Stata/MP 12.1 (StataCorp LP, College Station, TX, USA).

Absolute and relative frequencies were calculated for the categorical (qualitative) variables. The differences in the categorical variables were analysed using chi-squared tests (Mantel–Haenszel) and Mc Nemar test, respectively. In order to guarantee a more conservative approach, only variables found to have a statistical association with a p-value ≤0.20 at the univariate analysis were included in the multivariate backward stepwise logistic regression model. Odds Ratios (ORs) and their 95% Confidence Intervals were calculated. Statistical significance was set at p-value <0.05.

3. Results

Three hundred and sixty-three subjects were enrolled in the study and completed the questionnaire. The main sociodemographic data are reported in Table 1. Mean age was 43.9 (SD±21.5) and median age was 47 (interquartile range 22-64). The sample included 172 (47.4%) males and 191 (52.6%) females. With regard to educational level, 49 costumers (13.5%) had a primary school degree, 58 (16%) a secondary school degree, 145 (39.9%) a high school degree and 111 (30.6%) a university degree.

Mean age ± SD		43.9 ± 21.5
Median age (interquartile range)		47 (22-64)
		n (%)
Gender	*- Male*	172 (47.4)
	- Female	191 (52.6)
Education	*- Primary school degree*	49 (13.5)
	- Secondary school degree	58 (16)
	- High school degree	145 (39.9)
	- University degree	111 (30.6)

Table 1. Sociodemographic characteristics of the n. 363 costumers accessing five community pharmacies of the Palermo area, Sicily.

In Table 2 are presented data on willingness of the costumers of community pharmacies to receive COVID-19 vaccination. Among the participants enrolled in the study, 259 (71.3%) expressed their willingness to receive COVID-19 vaccination, while 104 (28.7%) declared their reluctance to get vaccinated against COVID-19.

The social determinant mainly associated with vaccination acceptance resulted to be “trust in safety and effectiveness of vaccinations” (46.7%), followed by “favourable information on COVID-19 vaccination” obtained through internet/media/social media (31.3%), “trust in health care system/government” (13.0%), and “any previous difficulties in vaccine administration” (8.9%).

The individual determinants mainly associated with the willingness to receive COVID-19 vaccination were the absence of any previous negative vaccination experience (60.6%), the confidence in COVID-19 vaccine safety and effectiveness (26.3%), the confidence in COVID-19 vaccines and in the Italian healthcare system (13.1%). Among those who expressed their refusal in receiving COVID-19 vaccination, the unfavourable information on COVID-19 vaccination obtained through internet/media/social media (71.4%) was the main social determinant, followed by personal negative experience with vaccination (17.9%) and the decision of the Italian Government not to introduce COVID-19 mandatory vaccination (9.5%).

The individual determinants mainly associated with COVID-19 vaccination refusal were lack of confidence in COVID-19 vaccines and in the Italian national healthcare system (66.3%), lack of confidence of safety and effectiveness of the vaccination in comparison with natural immunity due to the disease (22.5%) and fear of the COVID-19 vaccine, also due to previous personal negative experiences with vaccinations (11.2%).

Question	Answer	n (%)
Are you willing to receive COVID-19 vaccination?	Yes	259 (71.3)
	No	104 (28.7)
If Yes, which social determinant is mainly associated with your decision?	Trust in health care system/government	32 (13)
	Trust in safety and effectiveness of vaccinations	115 (46.7)
	Information obtained on COVID-19 vaccination (internet/media/social media) are favourable	77 (31.3)
	Any previous difficulties in vaccine administration	22 (8.9)
If Yes, which individual determinant is mainly associated with your decision?	COVID-19 vaccine is safe and effective and COVID-19 disease is more dangerous	56 (26.3)
	Confidence in COVID-19 vaccines and in the Italian national healthcare system	28 (13.1)
	No previous negative vaccination experience	129 (60.6)
If No, which social determinant is mainly associated with your decision?	No introduction of mandatory COVID-19 vaccination	8 (9.5)
	Personal negative experience with vaccinations	15 (17.9)
	Information on COVID-19 vaccination obtained through internet/media/social media are not favourable	60 (71.4)
	Some previous difficulties in vaccine administration	1 (1.1)
If No, which individual determinant is mainly associated with your decision?	COVID-19 vaccine is not safe and effective as compared to natural immunity that could protect general population	20 (22.5)
	Lack of confidence in COVID-19 vaccines and in the Italian national healthcare system	59 (66.3)
	Fear for COVID-19 vaccine (also due to personal negative experiences on vaccination)	10 (11.2)

Table 2. Willingness to receive COVID-19 vaccination of n. 363 costumers accessing five community pharmacies in the Palermo area of Sicily.

In Table 3 attitudes of the sample population in study regarding seasonal 2020/2021 influenza vaccination are presented. Among participants, 184 (51.7%) received seasonal influenza vaccination and 172 (48.3%) were not vaccinated. 37.5% of interviewed costumers thought that COVID-19 pandemic has conditioned influenza vaccination adherence/refusal during 2020/2021 season, with a positive conditioning on influenza vaccination adherence according to 91.8% of them.

The multivariate analysis (Table 4) highlighted a significant statistical association between willingness to receive COVID-19 vaccination and male gender (Adj-OR= 4.63; 95%CIs: 2.61 – 8.19) and influenza vaccination acceptance due to the impact of COVID pandemic (Adj-OR= 4.55; 95%CIs: 2.25 – 9.20), while participants aged ≥47 years old were significantly more reluctant in COVID-19 vaccination acceptance (Adj-OR= 0.21; 95%CIs: 0.11 - 0.37).

Answers to questions		n (%)
Did you get seasonal influenza vaccination in 2020/2021?	*- Yes*	184 (51.7)
	- No	172 (48.3)
Has the ongoing COVID-19 pandemic conditioned influenza vaccination adherence during 2020/2021 season?	*- Yes*	135 (37.5)
	- No	225 (62.5)
If Yes, was the conditioning positive or negative?	*- Positive*	167 (91.8)
	- Negative	15 (8.2)

Table 3. Attitudes of n. 363 costumers accessing five community pharmacies in the Palermo area of Sicily, with regard to seasonal 2020/2021 influenza vaccination.

	Willingness to receive COVID-19 vaccination			
	Crude OR (95%CIs)	p-value	Adj-OR (95%CIs)	p-value
Gender				
- Female	*Ref.*	**<0.001**	*Ref.*	**<0.001**
- Male	3.39 (2.06–5.59)		4.63 (2.61–8.19)	
Age classes				
- ≤ 46 years	*Ref.*	**<0.001**	*Ref.*	**<0.001**
- ≥ 47 years	0.25 (0.15-0.42)		0.21 (0.11-0.37)	
Education				
- primary/secondary/high school degree	*Ref.*	**<0.01**	*Ref.*	0.07
- university degree	2.10 (1.22-3.62)		1.79 (0.94–3.42)	
Influenza vaccination 2020/2021				
- No	*Ref.*	**<0.05**	*Ref.*	0.54
- Yes	1.70 (1.07-2.70)		1.20 (0.65-2.22)	
Influenza vaccination acceptance due to COVID pandemic				
- No	*Ref.*	**<0.001**	*Ref.*	**<0.001**
- Yes	4.37 (2.46-7.77)		4.55 (2.25–9.20)	

Adj-OR: adjusted odds ratio; 95%CIs: 95%Confidence Intervals

Table 4. Factors associated with willingness to receive COVID-19 vaccination (crude and adjusted odds ratios) in n. 363 costumers accessing five community pharmacies in the Palermo area of Sicily.

4. Discussion

Our findings show that the general population had a good propensity to accept COVID-19 vaccination when it became available. The high acceptance rate was similar to coverage rates observed in Israel and the UK, the first countries to begin the vaccination campaign and to reach the herd immunity target in the general population [15, 16].

According to our experience, the male sex was significantly more prone to adhere to COVID-19 vaccination. This could be associated with a higher risk perception of contracting COVID-19 disease that, since the beginning, demonstrated higher death and morbidity rates among the male sex [17].

Contrary to expectation, older people (≥47 years) showed significantly lower willingness to receive COVID-19 vaccination than younger people.

Probably, the major needs of socialization and easier access to scientific information could contribute to explain the higher willingness of younger age classes to be vaccinated [18, 19].

The social determinants more associated with the willingness to receive COVID-19 resulted to be the trust in safety and effectiveness of vaccinations and favourable information on COVID-19 vaccination obtained through the internet, mass media, and social media [18]. Moreover, the individual determinant mostly associated with the intention to get vaccinated was no previous negative vaccination experience. When considering the determinants that negatively influenced adherence to COVID-19 vaccination, the majority of the costumers interviewed reported that information on COVID-19 vaccination obtained through the internet, mass media and social media have played an unfavourable role [20]. This could depend on the uncontrolled spread of fake news about COVID-19 vaccination and pandemic (called "infodemic"), and confirmed by the reports of official websites of national and international health authorities [21].

Of interest, influenza season was estimated to overlap with the second wave of COVID-19 pandemic in the northern hemisphere during the 2020/2021 cold season [22, 23].

The impact of the first wave of COVID-19 pandemic, fear of an uncontrolled increment of hospitalization in medical and intensive care unit wards, the possible difficulties in differential diagnosis between the two respiratory diseases all had positively influenced the propensity of being vaccinated against the 2020/21 seasonal influenza, also in Italy [24, 25].

In the context of the COVID-19 pandemic, influenza vaccination together with preventive measures to limit SARS-CoV-2 infection, played a major role during the 2020/21 influenza season in order to reduce the burden of seasonal influenza disease and the associated pressure on healthcare systems, helping HCWs to distinguish patients with different influenza-like illness (ILI) [26, 27, 28].

Recently, the same trend was reported in the Italian setting [23].

Vaccination coverage observed in the study sample confirmed a higher acceptance of flu vaccination during 2020/2021 in comparison with previous influenza seasons also in Sicily [29, 30].

Moreover, the adherence to influenza vaccination due to COVID-19 pandemic was significantly associated with willingness to receive COVID-19 vaccination, as previously observed in literature [30, 31].

This study has some limitations. In particular, the sample recruited was not representative of the general population in Sicily but could only represent a convenience sample.

Anyway, the geographical distribution of the community pharmacies involved in the study within the entire area of the Province of Palermo could support a proxy representativeness among the whole area of intervention and among different socioeconomic and deprivation indexes. Moreover, despite our findings on willingness to accept COVID-19 vaccination being similar to vaccination coverage rates observed in other countries that began early vaccination campaigns, we cannot exclude the presence of a selection bias.

Our experience, together with the available body of evidences, highlight the importance to implement an accurate, informative and communicative campaign dedicated to subjects that are more hesitant regarding COVID-19 vaccination (e.g. female sex, adults, people that usually do not adhere to influenza vaccination campaign) [32, 33]

These strategies should be supported by an appropriate training on vaccinology during university and post-graduation courses, and for all the HCWs actively involved in mass vaccination campaign in line with similar experiences documented for other topics of Public Health concern [34-36].

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