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Research Paper

Hospital staff members' preferences about who should be prioritized to receive the COVID-19 vaccine: People with or without Alzheimer's disease?



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ABSTRACT

Background

There is no doubt that people with dementia can greatly benefit from the COVID-19 vaccine, especially as they are at an increased risk of developing severe complications, including long hospitalizations and high mortality rates, as a result of being infected by the virus. However, they might need the encouragement of health professionals to become vaccinated. Professionals' preferences regarding vaccination for this group are, therefore, extremely important to increase the use of this preventive measure.

Aims

1. To examine hospital staff members' preferences for COVID-19 vaccination to people with or without Alzheimer's disease (AD) while differentiating between a young and an old person with the disease. 2. To examine the factors associated with these preferences.

Methods

A cross-sectional survey using a structured and anonymous self-report questionnaire was conducted among a sample of 278 Israeli medical staff (nurses, physicians, and paraprofessionals) working at a general hospital. The data were collected in August 2021.

Results

Overall, the majority (68.4%) of participants chose the 80-year-old patient with a diagnosis of AD to be the last to receive the vaccine. The percentage of participants who preferred to give the vaccine first to the 55-year-old patient with AD was almost equal to the percentage of those who preferred giving the vaccine first to the 80-year-old patient who was cognitively intact. Religion and beliefs about susceptibility to contracting COVID-19 were significantly associated with participants' preferences.

Conclusion

Our results suggest that hospital staff members find it difficult to decide whether age or cognitive status should be the main factor in deciding which patient should receive the vaccine first. Therefore, there is a need to implement several policy and practical steps in hospitals to assist the medical staff in such decision-making processes.

Introduction

Alzheimer's disease (AD) is the most common type of dementia, and is characterized by a progressive decline in a variety of cognitive functions (Alzheimer's Association, 2020). (Alzheimer's Association, 2020). People with AD are particularly vulnerable to SARS-CoV-2, the virus that causes COVID-19 (Liu et al., 2020), and when sick they are confronted with serious health consequences, often including long hospitalizations

and high mortality rates (Albitar, Ballouze, Ooi, & Ghadzi, 2020; Kill-erby et al., 2020).

Given these deleterious consequences and the difficulties of people with dementia to adhere to preventive measures, such as using a mask, social distancing, and maintaining proper hand hygiene (Brown, Kumar, Rajji, Pollock, & Mulsant, 2020), it is of great importance that they get vaccinated. Nevertheless, concerns about the safety of these new vaccines were identified early on as a barrier to vaccination rates (Karlsson

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et al., 2021) among the general public, including people with dementia.

Healthcare professionals, such as physicians, nurses, and paraprofessionals – both in community and hospital settings – play an important role in the vaccination process. First, as demonstrated in previous studies, the attitudes and beliefs of hospital medical staff regarding the safety of vaccines against other diseases (e.g., influenza) are an important factor for increasing the public's adherence to vaccination (Alphons & Barratt, 2020; Nowak, Sheedy, Bursley, Smith, & Basket, 2015; Schneeberg et al., 2014). Moreover, studies have shown that healthcare staff members' positive attitudes toward vaccines have helped the public to overcome their negative attitudes on the matter (Kan & Zhang, 2018). It can be assumed that these findings might also apply to the recently developed COVID-19 vaccines (Shaw et al., 2021).

Second, healthcare professionals have an important role in setting priorities for allocating life-saving resources, such as the COVID-19 vaccines, especially in conditions of scarcity. Deciding which groups should be prioritized in receiving the vaccine first is an ethical dilemma confronting not only decision-makers but also healthcare professionals (Giubilini, Savulescu, & Wilkinson, 2020). Due to the impact of the novel coronavirus on people diagnosed with AD (Canevelli et al., 2020; Numbers & Brodaty, 2021), it is important to assess the preferences of healthcare professionals for the administration of COVID-19 vaccines to people with or without AD and to understand the factors associated with these preferences. Therefore, the present study's goal was to examine this topic among hospital-based healthcare professionals in Israel. It is important to note that vaccines in Israel are usually given in the community rather than in hospitals. However, because COVID-19 is perceived as a life-threatening disease, medical staff were expected to administer these vaccines at hospitals as well. Indeed, after the vaccine was approved, hospitals vaccinated all at-risk patients as well as those aged 60 and over and their families. That is, the vaccine has been administered in hospitals by doctors and nurses, a practice which is not generally conducted with routine vaccinations.

In addition, we examined the factors associated with such preferences. These factors were selected on the basis of literature on the topic of preference-setting during the COVID-19 pandemic, and in general. For example, studies examining the correlates of other scarce medical resources (such as ventilators) during the pandemic, among laypersons as well as medical staff, found that demographic variables (e.g., education) (Werner & Landau, 2020) and professional characteristics (e.g., type of profession – physicians, nurses, paramedical professionals) (Idilbi, AboJabel, & Werner, 2021) were associated with participants' preferences. In addition, previous studies that have examined the allocation of resources under conditions of scarcity found preferences to be influenced by ethical considerations and moral values (Emanuel et al., 2020). Finally, according to the utility criterion, priority regarding scarce resources should be given to those who can more greatly benefit from such resources (Craxi, Casuccio, Amodio, & Restivo, 2021; Emanuel et al., 2020; Persad, Wertheimer, & Emanuel, 2009). Thus, based on this literature, we examined the relationship between medical staff members' preferences for vaccination and their (a) sociodemographic and professional characteristics, (b) moral justifications, (c) overall beliefs about AD, and (d) beliefs about COVID-19.

Method

Study population and sample

The study population comprised members of the medical staff at one general hospital in northern Israel. Inclusion criteria were that participants had to be members of the medical staff (physicians, nurses, and paraprofessionals) who worked in various hospital departments and had more than 6 months of professional experience. The exclusion criterion was a lack of command of the Hebrew language.

Procedure

A cross-sectional study was conducted among a convenience sample of medical staff members working at a general hospital. Based on a confidence level of 95%, a population size of 1000, and a margin error of 5%, the sample size needed was 270 (Qualtrics, 2020). The research coordinator at the hospital met with staff members in different departments of the hospital. She explained the general purpose of the research and its importance. Following this explanation, the questionnaires were distributed in the various departments, and collected after completion. The protocol of the study was approved by the Ethics Committee of the University of Haifa, and was conducted in August 2021 – that is, before the COVID-19 vaccines were approved for use in humans and before the start of the COVID-19 immunization program in Israel. In addition, it should be noted that this period of time in Israel signified a post-first-lockdown and pre-second-lockdown period, a time during which life had returned to some degree of normalcy. Indeed, the hospital at which the study was conducted had almost resumed its former routine.

Measures

Dependent variable

Preferences for administration of COVID-19 vaccines. Participants were presented with a description of three patients of different ages and cognitive statuses: Moses was a 55-year-old man with a diagnosis of AD, Jacob was an 80-year-old man with a diagnosis of AD, and Samuel was an 80-year-old man with no cognitive decline. The three patients were described as married and the fathers of three children, living at home with their spouses, and diagnosed with diabetes and high blood pressure. After presenting the description, participants were asked two questions: (1) Which of the three patients would you choose to be the first to receive the COVID-19 vaccine? (2) Which of the three patients would you choose to be the last to receive the COVID-19 vaccine?

Independent variables

Based on previous studies on a related subject (Idilbi, AboJabel, & Werner, 2021; Werner & Landau, 2020), the factors examined included sociodemographic and professional factors, moral reasoning, beliefs about AD, and beliefs about COVID-19 itself.

Sociodemographic characteristics. These included gender, education (number of years), marital status (single/widowed versus married), religion (Jewish versus other religions, consisting of Muslim, Christian, and Druze), and level of religiosity (secular versus traditional/religious/Orthodox).

Moral reasoning. Participants were asked to report on the importance they attributed to 10 items that reflect ethical principles and reasons for prioritizing medical care (Denburg, Ungar, Chen, Hurley, & Abelson, 2020). Each item was rated on a 5-point Likert-scale, ranging from 1 (*not at all important*) to 5 (*very important*). Sample item: "Everyone deserves the same chance of being rescued from life-threatening circumstances." An overall index was calculated by averaging the items. The index showed good internal reliability (Cronbach's alpha = 0.73).

AD variables. Similar to other studies (Idilbi, AboJabel, & Werner, 2021; Werner & Landau, 2020), these variables included stigmatizing attitudes toward a person diagnosed with AD, beliefs about susceptibility to and fear of becoming ill with AD, as well as subjective knowledge and familiarity with AD.

Stigmatizing attitudes toward a person diagnosed with AD were assessed by examining participants' emotional reactions and discriminatory behaviors toward a person with AD. Regarding their emotional reactions,

participants were asked to what extent they were concerned that other people would feel the following seven feelings toward them if they were diagnosed with AD. Each item was rated on a 5-point Likert-scale, ranging from 1 (*not at all*) to 5 (*to a very large extent*). Two indexes were calculated: The first index included averaging the items that examined three positive emotions (pity, desire to help, and concern), and the second index included averaging four items that examined negative emotions (fear, uneasiness, disgust, and ridicule). The two indices showed good internal reliability (Cronbach’s alpha = 0.76 and 0.87 for the positive and negative indices, respectively). Regarding discriminatory behaviors, participants were asked to what extent they were concerned that other people would treat them in a discriminatory manner if they were diagnosed with AD. Each item was rated on a 5-point Likert-scale, ranging from 1 (*not at all*) to 5 (*to a very large extent*). Sample item: “How worried would you be that other people would avoid you?” An overall index was calculated by averaging the items. The index showed good internal reliability (Cronbach’s alpha = 0.91).

Susceptibility to developing AD. Participants were asked to report the extent to which they believed they had a risk of developing AD during their lifetime. The item was rated on a 5-point Likert-scale, ranging from 1 (*no risk at all*) to 5 (*a very high risk*).

Fear of developing AD. Participants were asked to report the extent to which they were afraid of developing AD during their lifetime. The item was rated on a 5-point Likert-scale, ranging from 1 (*not afraid at all*) to 5 (*very much afraid*).

Subjective knowledge about AD was assessed via a single question: “How much do you know about AD?” The answer to the question was rated on a 5-point Likert-scale, ranging from 1 (*do not know at all*) to 5 (*know very much*).

Familiarity with AD was assessed by asking the participants whether they know someone with AD.

COVID-19 variables. Similar to other studies (Werner & Landau, 2020), these variables included beliefs about susceptibility to and fear of contracting COVID-19.

Susceptibility to contracting COVID-19. Participants were asked to report the extent to which they believed they were at risk of contracting COVID-19. The item was rated on a 5-point Likert-scale, ranging from 1 (*no risk at all*) to 5 (*very high risk*).

Fear of contracting COVID-19. Participants were asked to report the extent to which they were afraid of contracting COVID-19. The item was rated on a 5-point Likert-scale, ranging from 1 (*not afraid at all*) to 5 (*very much afraid*).

Data analysis

The data were coded and analyzed using the statistical software SPSS version 25.0. Descriptive statistics (percentages, means, and standard deviations) were used to describe the sample characteristics and main variables. Bivariate correlations between the dependent and the independent variables were examined using chi square tests. For these analyses, continuous variables were dichotomized at the median. A multinomial forward stepwise logistic regression was performed to test which of the independent variables explained the dependent variable. Only variables that were found to be significant in the bivariate correlation analysis were included in the regression.

Ethical considerations

The study’s protocol was approved by the Ethics Committee of the

Faculty of Social Welfare and Health Sciences at the “University of Haifa.”

Results

Participants’ characteristics

Overall, 278 medical staff members participated in the study (response rate 28%). The majority of participants were women (61.4%), non-Jewish (59.0%), and married (75.1%). As for professional characteristics, about 72.9% were nurses, 21.6% were physicians, and the rest were paraprofessionals. In addition, participants reported that they had an average of 12.9 years of professional experience (SD = 10.8, range = 1–40), and an average of 5.6 years of experience working with people with dementia (SD = 7.9, range = 0–33).

Dependent variable: participants’ preferences for who should receive the COVID-19 vaccination first/last

As can be seen in Fig. 1, participants’ preferences regarding the patient who should receive the vaccine last were very clear. Of the three choices, the vast majority (68.4%) of participants chose the 80-year-old patient with a diagnosis of AD to be the last to receive the vaccine. Given these results, we did not examine further the correlates of this preference. As for participants’ preferences regarding the patient who should receive the vaccine first, these were divided equally between the 80-year-old patient with no cognitive decline (42.4%) and the 55-year-old patient with a diagnosis of AD (44.2%).

Independent variables

Table 1 presents the descriptive statistics for the independent variables. As can be seen, the mean level of moral reasoning was moderate (mean = 3.80; SD = 0.51). Regarding AD variables, study participants reported having moderate levels of beliefs about susceptibility to and fear of becoming ill with AD (mean = 2.91, SD = 0.91), but estimated that they had a fairly high level of knowledge about the disease (mean = 3.81, SD = 0.86). Moreover, a little over half of the participants (54.5%) reported knowing a person with AD. Finally, the participants reported low levels of negative emotions (mean = 2.85, SD = 1.18), and moderate levels of social distancing and positive emotions toward a person diagnosed with AD (mean = 3.12, SD = 1.00). As for the COVID-19 variables, study participants reported having a moderate-high level of beliefs about susceptibility (mean = 3.57, SD = 1.01), and a moderate level of fear of contracting COVID-19 (mean = 2.94, SD = 1.28).

Factors associated with medical staff preferences

As can be seen in Table 2, according to bivariate correlations,

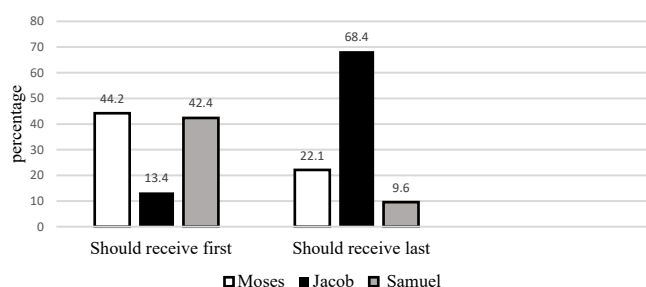


Fig. 1. Participants’ preferences for who should receive the COVID-19 vaccination first/last (n = 278).
 Moses – 55 years old with a diagnosis of AD.
 Jacob – 80 years old with a diagnosis of AD.
 Samuel – 80 years old, cognitively intact.

Table 1
Mean (SD)/% of the independent variables.

Independent variables	Mean (S.D.)/%	Range in sample
Moral justifications	3.80 (0.51)	1.67–5.00
AD variables		
Susceptibility	2.91 (0.91)	1–5
Fear of getting AD	3.17 (1.29)	1–5
Subjective knowledge	3.81 (0.86)	1–5
Familiarity (%)		
No	45.5	
Yes	54.5	
Social distancing	3.13 (1.00)	1–5
Negative emotions	2.85 (1.18)	1–5
Positive emotions	3.39 (0.99)	1–5
COVID-19 variables		
Susceptibility	3.57 (1.01)	1–5
Fear of contracting disease	2.94 (1.28)	1–5

Table 2
Correlates of participants' preferences for who should receive the COVID-19 vaccination first (%) (n = 278).

Correlates	Moses	Jacob	Samuel
Sociodemographic characteristics			
Gender			
Male	40.6	16.8	42.6
Female	47.0	11.0	42.1
Education			
Less than 17 years	49.5	14.0	36.4
17+ years	41.6	11.7	46.7
Marital status			
Single	40.3	19.4	40.3
Married	46.0	11.1	42.9
Religion*			
Jewish	41.5	6.6	51.9
Other	47.7	16.6	35.8
Religiosity			
Secular	42.4	13.9	43.8
Traditional+Religious+Orthodox	46.7	12.5	40.8
Profession			
Physician	32.1	17.9	50.0
Other (nurses, occupational therapists, physiotherapists, paramedics)	47.4	12.2	40.4
Professional experience**			
< 10 years	41.6	20.0	38.4
≥ 10 years	47.1	6.6	46.3
Working with people with dementia			
< 2 years	44.6	14.3	41.1
≥ 2 years	44.5	10.9	44.5
Moral justifications			
Low	45.7	13.4	40.9
High	43.9	12.9	43.2
AD variables			
Susceptibility			
Low	44.2	11.6	44.2
Medium+High	43.6	14.4	42.0
Fear of getting AD			
Low	41.6	13.5	44.9
Medium+High	44.9	13.6	41.5
Subjective knowledge			
Low+Medium	48.9	16.7	34.4
High	42.1	11.8	46.1
Familiarity			
No	48.5	11.9	39.6
Yes	41.8	10.7	47.5
Social distancing			
Low	45.3	15.6	39.1
High	43.6	11.4	45.0
Negative emotions			
Low	44.2	14.0	41.9
High	44.3	12.4	43.3
Positive emotions			
Low	39.6	14.2	46.2
High	47.2	12.9	39.9
COVID-19 variables			
Susceptibility**			
Low	26.1	34.8	39.1
Medium+High	45.8	10.6	43.6
Fear of contracting disease			
Low	39.8	16.3	43.9
Medium+High	46.7	11.4	41.9

**p < .01, * p < .05.

statistically significant associations were found between participants' preferences regarding who should receive the vaccine first and participants' religion ($Y^2_{(2)} = 9.29, p < .05$), work experience ($Y^2_{(2)} = 10.35, p < .01$), and beliefs about their susceptibility to contracting COVID-19 ($Y^2_{(2)} = 11.56, p < .01$). In addition, when examining the unique

contribution of each of these variables to the explanation of these preferences, it was found that although the regression model as a whole was statistically significant ($\chi^2_{(4)} = 18.74, p = .001$), none of these factors contributed to the preference of Moses (young patient with AD) over Samuel (an older patient without AD). As for the preference of Samuel (an older patient without AD) over Jacob (an older patient with AD), religion and feelings about one's susceptibility to contracting COVID-19 significantly contributed to the dependent variable. Specifically, Jewish participants compared to non-Jewish participants ($B = -1.42, SE = 0.59, ORs = 4.15, p = .016, CI = 1.297-13.286$), and participants who perceived themselves as having a middle-high risk of contracting COVID-19 compared to those who perceived themselves as having a low risk ($B = -1.43, SE = 0.54, ORs = 0.23, p = .008, CI = 0.082-0.086$), preferred to give the vaccine first to Samuel and not Jacob. By contrast, only the susceptibility to contracting COVID-19 contributed to the preference of Moses (a young patient with AD) over Jacob (an older patient with AD) ($B = -1.43, SE = 0.64, ORs = 7.22, p = .002, CI = 2.051-25.443$). Specifically, participants who perceived themselves as having a middle-high risk of contracting COVID-19, compared to those who perceived themselves as having a low risk, preferred to give the vaccine first to Moses and not Samuel (see Table 3).

Discussion

The literature has shown that elderly people are at an increased risk of developing severe complications, including high mortality rates, as a result of being infected with COVID-19 (Albitar et al., 2020; Killerby et al., 2020; Yao et al., 2020). Such risks are even higher when it comes to people with dementia (Ghaffari et al., 2021; Numbers & Brodaty, 2021). Therefore, there is no doubt that people with dementia can greatly benefit from the COVID-19 vaccine. However, the question arises as to whether or not people with dementia – regardless of age – should or should not be given preference over other groups in receiving the vaccine. Given the key roles that medical staff members play in transmitting information and support regarding health-promoting behaviors, such as vaccines, especially among elderly people (Alphons & Barratt, 2020; Kan & Zhang, 2018; Nowak et al., 2015; Schneeberg et al., 2014), the present study examined this question among hospital medical teams.

Our findings showed that participants' preferences regarding which of the three patients should be the last to receive the vaccine were unequivocal. Nearly two-thirds of the participants reported that the 80-year-old patient with AD was the one who should be vaccinated last, with only one in eight participants believing he should be vaccinated first. Similar findings have been reported regarding the preferences of both the general public and medical staff members regarding the allocation of ventilators (Idilbi, Abojabel, & Werner, 2021; Werner &

Table 3
Multinomial stepwise logistic regression of participants' preferences for who should receive the COVID-19 vaccination first (n = 278).

	B(SE)	ORs	p	95% CI
Moses (young with AD) vs Samuel (old without AD)				
Religion (Arab/Jewish)	-0.43 (0.27)	0.65	.123	0.377–1.123
Susceptibility to contracting COVID-19	-0.55 (0.59)	0.57	.348	0.181–1.826
Jacob (old with AD) vs Samuel (old without AD)				
Religion (Arab/Jewish)	-1.43 (0.54)	0.23	.008	0.082–0.686
Susceptibility to contracting COVID-19	1.42(0.59)	4.15	.016	1.297–13.286
Jacob (old with AD) vs Moses (young with AD)				
Religion (Arab/Jewish)	-1.01 (0.54)	0.36	.064	0.126–1.062
Susceptibility to contracting COVID-19	1.97(0.64)	7.22	.002	2.051–25.443

Landau, 2020). These findings suggest that hospital medical staff perceive an older person with a diagnosis of dementia as having the lowest chance of benefiting from the COVID-19 vaccine compared to other groups (i.e., a younger person with dementia or an older person without dementia) even though their clinical and family statuses are identical. These findings raise an important ethical question: Will older people with dementia at a time of national crisis be discriminated against when medical staff have to make decisions regarding the allocation of limited resources that are considered life-saving (e.g., a vaccine or ventilator), despite the fact that crisis conditions should not be an excuse to infringe on the rights of this or any other group? Allocating resources according to criteria such as patients' age (Miller, 2020), their chances of defeating the disease (van Bruchem-Visse, Dijk, Beaufort, & Mattace-Raso, 2020), and their cognitive status runs contrary to the moral duty of society and of the institutions responsible for providing health services to protect and respect the dignity and autonomy of elderly people, regardless of cognitive status (Carrieri, Peccatori, & Boniolo, 2020). Indeed, not-for-profit organizations such as Alzheimer's Europe and Alzheimer's Disease International have clearly raised the alarm against such discrimination (Alzheimer's Disease International (ADI), 2020; Alzheimer's Europe, 2020).

The question regarding medical staff preferences for vaccination becomes even more challenging when there is a combination of patient's age and level of cognitive function. The percentage of participants who preferred to give the vaccine first to a 55-year-old patient with AD was almost equal to the percentage of those who preferred giving the vaccine first to an 80-year-old patient who was cognitively intact. These findings are important and point to two meaningful conclusions. First, they show that the medical staff in the present study were unable to determine which of the two patients might benefit to a greater extent from the vaccine. This finding may be related to the fact that physicians have difficulty estimating survival time among people with dementia (Haakma et al., 2019). Second, the medical staff in the present study seemed to base their decisions regarding vaccination on values of equality and dignity regardless of the age or type of disability of the patient. These findings are consistent with the scientific literature and policy makers' recommendations (Kim & Grady, 2020; Ministry of Health, 2020).

Contrary to our expectations, only a few of the independent factors examined in the present study statistically significantly contributed to the explanation of participants' preferences. These variables included religion and beliefs about being susceptible to contracting COVID-19. As for religion, it was found that Jewish participants, compared to other participants, preferred giving the vaccine first to Samuel (an older patient without AD) rather than to Jacob (an older patient with AD). These results are not surprising in terms of what they reveal about differences in Jewish/Arab perspectives: Compared to the Jewish population, the Arab sector in Israel is characterized by stronger social relationships and a higher commitment to providing care for family members (Abdullah, 2016; Ayalon, 2018). Furthermore, Arab society tends to put a relatively greater emphasis on caring for elderly people in general, and for those with cognitive decline in particular (Yaghmour, Bartlett, & Brannelly, 2018). Regarding susceptibility to contracting COVID-19, compared to participants who perceived themselves as having a low risk of contracting COVID-19, those who perceived themselves as having a medium-high risk of contracting COVID-19 preferred giving the vaccine first to Samuel (an older patient without AD). In addition, they preferred giving the vaccine first to Moses (a young patient with AD) rather than to Jacob (an older patient with AD). According to cognitive models of health behavior (such as the Health Belief Model and the Theory of Planned behavior), the likelihood of a person adopting a particular health behavior is determined by their perceived disease susceptibility and their belief in the effectiveness of the health behavior (Janz, Champion, & Strecher, 2002). These associations have been confirmed for the willingness to get vaccinated against COVID-19 as well (Erawan, Zaid, & Lestari, 2021; Hossain et al., 2021; Yehualashet et al., 2021).

However, the abovementioned studies were conducted among samples in the general public. In the current study – which focused on the intentions of professionals not for themselves but for their patients – professionals selected those individuals who they perceived to be more likely to benefit from the vaccine, as has been demonstrated in priority-setting studies in other areas (Pinho & Veiga, 2020).

The present study had a number of limitations. First, a cross-sectional study was used, so causal conclusions cannot be drawn. Second, the data were collected from only one hospital, which limits the possibility of generalizing the findings. Third, the response rate in the present study was relatively low, although it was higher than the response rates in other studies conducted with a similar population during the COVID-19 crisis (Holton et al., 2020; Moro et al., 2020). Fourth, although we used valid and reliable tools, they relied on self-reports by medical staff, potentially resulting in an increased participant response bias. Fifth, unfortunately, we did not collect information about participants' age. Therefore, we were unable to examine associations between this variable and the others, and the potential findings may have shed more light on the issues at hand. Sixth, we did not collect information regarding participants' exposure to or involvement with the care of people with COVID-19. Given that professionals providing direct care to these patients were very busy and burdened with work during the pandemic, it could be hypothesized that refusal rates were higher among them, a situation that might have further biased our sample. However, Israel at the time of data collection was in a post-first-lockdown, pre-second-lockdown period. As such, the hospitals had returned to an almost normal work routine, likely reducing the bias resulting from a lack of information about exposure to the virus.

Finally, we included a 55-year-old patient with cognitive decline, but not a 55-year-old patient *without* cognitive decline, thus limiting the ability to understand the effect of age on medical staff preferences. We would suggest that future studies use a larger and more representative sample, as well as different strategies (such as face-to-face interviews), to overcome some of these limitations. Furthermore, given the low number of statistically significant correlates found in this study, we would suggest that future studies also investigate other factors such as knowledge, perceptions, and attitudes concerning the COVID-19 vaccine. Studying these factors might make an important contribution, especially as previous studies have shown that such factors are associated with a higher likelihood of medical staff recommending vaccines in general to patients (Nutaman & Yoeli, 2016). Indeed, it is important to examine such a goal at this time. Presumably medical staff members have by now (after the start of the immunization program, and even after its peak in some countries) gained much experience and knowledge regarding the COVID-19 vaccine.

Despite these limitations, the present study makes unique contributions to the field. Specifically, the findings suggest that hospital medical staff find it difficult to decide whether age or cognitive status should be the main factor in deciding which patient should receive a vaccine first. This is an important finding especially since at times of a crisis – such as the COVID-19 pandemic – nurses in hospital settings are at the frontline and are requested to help making important decisions for all patients, including those with dementia, and their families. These decisions include triaging, as well as encouraging taking preventive measures, such as vaccination (Al Thobaity & Alshammari, 2020). Other important decisions facing nursing staff at disaster times include the allocation of life-saving resources (e.g., allocating a ventilator or providing specific treatments).

Facing these difficult decisions is difficult, and medical staff might be exposed to a myriad of ethical dilemmas wherein they will be obligated to make decisions that run contrary to their personal values. As studies have shown that medical staff who are more exposed to ethical dilemmas report high levels of anxiety, depression, sleep problems, and obsessive-compulsive symptoms (Zhang et al., 2010), we recommend promptly providing them with the help to deal with these situations. Indeed, we believe that implementing several measures in hospitals can

assist medical staff in the decision-making process. These measures include developing clear triaging protocols regarding priorities for providing treatment to people with dementia in times of emergency. Needless to say, these triaging protocols must include the standard ethical and moral principles (Pathak, Sönmez, & Ünver, 2020) adhered to in the treatment of people with dementia. In addition, they should include objective measures to assess the chances of survival of people with dementia. However, it should be noted that in view of the heterogeneity of dementia, before making these difficult decisions, the medical staff should also be encouraged to assess the specific characteristics of each patient individually, and should respect patients' wishes by clarifying (directly or through their next-of-kin) patients' own wishes and preferences. Finally, developing workshops that aim to raise awareness about AD and its stages can also help medical staff make these decisions.

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Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations of interest

None.

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