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Attitudes of patients with severe mental illness towards COVID-19 vaccinations: A preliminary report from a public psychiatric hospital

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ABSTRACT

Background: As patients with severe mental illness are at increased risk for COVID-19 mortality, the issue of willingness to be vaccinated is of extreme importance.

Methods: During February 2021 Shalvata Mental Health hospital provided Covid-19 vaccines to its patients. Fifty one patients suffering from severe mental illness, out of 196 patients hospitalized in closed, open or day wards during that period, signed the informed consent and were assessed for their clinical condition (OQ-45), fear of Covid-19 (FCV-19S) and approach to the vaccine (C19-VHS). All patients who were not vaccinated in February 2021 (baseline) were re-approached a month later to assess whether they had gotten vaccinated since.

Results: Patients who were not vaccinated at baseline had an oppositional approach to the vaccine, and did not significantly differ in their fear of Covid-19 levels or in levels of clinical severity ($t(49) = 2.51, p = 0.02$) from those who were vaccinated. From the 29 patients who were not vaccinated at baseline approach to the vaccine was a good predictor to getting vaccinated after one month (79% positive predictive value).

Conclusions: The majority of patients suffering from a severe mental illness are willing to get vaccinated, and their decision of whether or not to get vaccinated is based on their viewpoint on the vaccine rather than being an outcome of their level of distress (OQ-45). It is important to allow vaccine accessibility to hospitalized patients, to consider their opinions and to provide useful information to lower vaccine hesitancy and improve vaccination rates.

1. Introduction

The coronavirus disease 2019 (Covid-19) pandemic has triggered a worldwide health crisis. People suffering from severe mental illnesses have vulnerable health (Walker et al. 2015; Wang et al. 2021), potentially presenting a risk for Covid-19 severity. Indeed, recent studies have demonstrated higher risks for morbidity and mortality due to Covid-19 in people suffering from severe mental illnesses (Lee et al., 2020; Li et al., 2020; Wang et al. 2021). The pandemic carries mental health consequences, especially for people with previous mental health difficulties (Liu et al., 2020; Hao et al., 2020). The use of social distancing as a central mean to protect from infection has posed additional stress and challenges for social support and mental health services (Sole et al.,

2021). Providing Covid-19 vaccines is likely beneficial for protection from both the general medical and some of the mental health threats of the pandemic (De Hert et al., 2021; Palermo 2020).

Supporting this view, a recent article suggested that people with severe mental illnesses should be granted early access to Covid-19 vaccines due to the aforementioned medical reasons (De Hert et al., 2021; Mazereel et al., 2021). Being hospitalized in psychiatric wards poses a risk for getting infected and spreading the virus to others in the ward, at times with detrimental consequences (Ji et al., 2020). Thus, examining the feasibility of vaccinating inpatients is extremely important. An important factor regarding the applicability of vaccinating this population is the patients' attitudes toward the vaccine. It is therefore important to study reluctance towards being vaccinated. Ethically and

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clinically it is crucial to inquire if avoiding the vaccine is related to general mental health, to fear of Covid-19, or to attitude towards the vaccine itself. In order to help current and future vaccination programs of psychiatric inpatients the present pilot study aimed to evaluate feasibility and patients' condition and views about the Covid-19 vaccine. As far as we know, there are no specific studies which examined the views and beliefs of psychiatric patients on the Covid-19 vaccine.

2. Methods

The study was approved by the Shalvata Mental Health Center Institutional Review Board (IRB; approval number SHA-007-20).

2.1. Procedures

The Shalvata Mental Health Center center has an encashment area of approximately 500,000 inhabitants, about 100 inpatient adult beds, and a net of outpatient clinics; thus hospitalizations are usually reserved for extreme crises. There are no chronic beds in the center. During the pandemic, the policy worldwide was to avoid psychiatric hospitalizations when possible, thus attenuating the severity of the condition of those who were hospitalized (de Girolamo et al., 2020; Abbas et al., 2021). Covid-19 vaccines (consisting of two shots three weeks apart) were offered to all adult Shalvata patients who were willing to be vaccinated and had no contraindications, and were first administered on January 11th, 2021. Some patients were admitted after already being vaccinated by their health care providers and others were discharged before the vaccines were given, thus not having the opportunity to be vaccinated during their hospitalization period.

Vaccines were initially given only to certain high risk populations in Israel, such as medical workers and tenants of nursing homes and psychiatric wards, and later to the entire Israeli population over the age of 16 years. For this reason, even patients who were not able to get the vaccine during their hospitalization, had the opportunity to be vaccinated after returning to their homes.

The patients were recruited from January 6th to February 2nd,

2021 from two closed wards, one open ward, and one day ward. Out of 196 patients hospitalized in these four wards during the relevant time frame, 51 patients were able and willing to participate in the study, and after signing the informed consent form, they were handed out a copy of the questionnaires and a short demographical questionnaire (baseline; Time 1). None of the patients had a legal guardian. Since even those patients who were hospitalized against their will were not forced to get vaccinated, the informed consent for participating in a non-interventional study about their attitudes towards being vaccinated was considered valid. Patients' main diagnosis was taken from the hospital's medical records. (Table 1). Most of the participants were severely mentally ill patients (most prevalent diagnoses were psychotic spectrum and personality disorders, with comorbidities) in acute decompensation. All patients were asked dichotomously (yes/no) if they had been vaccinated, and in case they had not been vaccinated, whether they intend to get vaccinated. Their answers were verified against the medical files in the ward.

Among 51 recruited patients, 22 patients had already been given the first vaccine shot when they participated in the study, and 29 were not vaccinated. A month later we contacted the participants who were not vaccinated at baseline to inquire if they did or did not vaccinate (Time 2). Two out of 29 patients who had not been vaccinated before recruitment were excluded from the statistical analysis due to lack of certainty about their willingness to get vaccinated. There were 27–47 days between Time 1 and Time 2 (Mean = 38.18. SD = 6.97). One patient who failed to complete the questionnaire was removed from some of the between-group analysis.

2.2. Participants

There was no significant difference between the two groups in patients' age (mean ± SD 37.22 ± 16.12), sex (54.9% were male), country of birth (74.5% were born in Israel), socioeconomic status or marital status. More than forty percent (40.9%) of the vaccinated group suffered from anxiety, compared to 10.3% in the unvaccinated group (p < 0.005). The majority of patients in the unvaccinated group had

Table 1

Demographic characteristics of the study population including patients who got vaccinated for Covid-19, patients who did not get vaccinated for Covid-19 and all patients.

Variable	Vaccinated (n = 22)	Did not get vaccinated (n = 29)	All patients (N = 51)	p-value
Sex (Males; n (%))	11 (50%)	17 (58.6%)	28 (54.9%)	0.54
Age (Mean (SD))	42 (20.09)	33.59 (11.38)	37.22 (16.12)	0.09
Birth country (Israel)	16 (72.7%)	22 (75.9%)	38 (74.5%)	0.79
Socio-economic status				0.09
Way below average	12 (54.5%)	12 (41.4%)	24 (47.1%)	
Below average	0 (0%)	7 (24.1%)	7 (13.7%)	
Average	7 (31.8%)	6 (20.7%)	13 (25.5%)	
Higher than average	3 (13.6%)	4 (13.8%)	7 (13.7%)	
Way higher than average	0 (0%)	0 (0%)	0 (0%)	
Marital status				0.62
Single	10 (45.5%)	19 (65.5%)	29 (56.9%)	
Married	4 (18.2%)	3 (10.3%)	7 (13.7%)	
Partnered	2 (9.1%)	2 (6.9%)	4 (7.8%)	
Divorced	4 (18.2%)	3 (10.3%)	7 (13.7%)	
Separated	1 (4.5%)	2 (6.9%)	3 (5.9%)	
Widow	1 (4.5%)	0 (0%)	1 (2%)	
Education				0.06*
Elementary school	2 (9.1%)	6 (20.7%)	8 (15.7%)	
High school	10 (45.5%)	19 (65.5%)	29 (56.9%)	
BA	8 (36.4%)	4 (13.8%)	12 (23.5%)	
MA	2 (9.1%)	0 (0%)	2 (3.9%)	
PhD	0 (0%)	0 (0%)	0 (0%)	
Diagnosis				
Psychotic spectrum	5 (22.7%)	11 (37.9%)	16 (31.4%)	0.24
Bipolar affective disorder	4 (18.2%)	2 (6.9%)	6 (11.8%)	0.25
Anxiety	9 (40.9%)	3 (10.3%)	12 (23.5%)	0.02
Depression	2 (9.1%)	4 (13.8%)	6 (11.8%)	0.61
Adjustment	0 (0%)	2 (6.9%)	2 (3.9%)	0.16
Attention	1 (4.5%)	2 (6.9%)	3 (5.9%)	0.73
Substance abuse	1 (4.5%)	2 (6.9%)	3 (5.9%)	0.73
Personality disorders	6 (27.3%)	8 (27.6%)	14 (27.5%)	0.98
Eating disorders	2 (9.1%)	4 (13.8%)	6 (11.8%)	0.61
Observation	1 (4.5%)	3 (10.3%)	4 (7.8%)	0.46

completed high-school education (65.5%), with only 13.8% having a higher education, while in the vaccinated group 45.5% had a higher education.

2.3. Measures

The Outcome Questionnaire-45 (OQ-45). A commonly used, well validated and reliable self-report questionnaire used as a comprehensive trans diagnostic assessment of patients’ clinical condition. It consists of 45 items, evaluating three different dimensions: (a) symptom distress, (b) interpersonal relationships, and (c) social role performance. While the total score range is 0–180, the cutoff score between clinical and nonclinical populations is 63 (Doerfler et al. 2002; Gross et al., 2015; Timman et al. 2017).

Fear of Covid-19 (FCV-19S). A self-report scale designed to measure fear of Covid-19 (Ahorsu et al., 2020). The questionnaire consists of seven items describing pandemic-related emotional fear reactions. Items are rated on a five-item Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) and a total sum score is calculated. The total scale range is 7–35, with higher scores demonstrating higher fear of Covid-19. This scale recently showed good psychometric properties in an Israeli sample (Tzur Bitan et al., 2020). The alpha coefficient of the FCV-19S in the current sample indicated high internal reliability (Cronbach’s alpha = .91).

Covid-19 Vaccine Hesitation Scale (C19-VHS). Based on the VHS, this is a set of questions developed by the Strategic Advisory Group of Experts on Vaccine Hesitancy (SAGE), in order to assess parents’ hesitancy to vaccinate their children (Larson et al., 2015)). The VHS has been psychometrically evaluated and validated in several populations and in 2019 was revised to a self-report tool to assess individuals’ hesitancy towards getting themselves vaccinated (Luyten et al. 2019). Recently, with the arrival of Covid-19 vaccines to Israel, the VHS was revised to the C19-VHS, a tool assessing hesitancy towards Covid-19 vaccinations (Grossman-Giron et al., currently under review), and has shown strong psychometric properties, with an alpha Cronbach of 0.88. It is composed of nine questions with a five-item Likert-type scale (see appendix). The questions are phrased as statements with a higher score presenting more agreement. These statements include: “being vaccinated is important for your health”, and “it is important to follow medical advice relating to the vaccine”. The scoring converges so that higher scores in this questionnaire point to a positive attitude towards the need to be vaccinated. The alpha coefficient of the C19-VHS in the current sample indicated an adequate internal reliability (Cronbach’s alpha = 0.74).

Intention to get vaccinated: participants were asked if they had already been vaccinated prior to participating in the study. Those who were not vaccinated, were asked if they were planning on getting vaccinated.

2.4. Statistical analysis

We assessed group differences in Time 1 using Independent sample t tests. Power analysis conducted using G*Power software, as post-hoc expected achieved power, and at alpha error probability of 0.05, indicated that the sample was sufficiently powered (1- α = 0.79) to detect large effect sizes for a given measure. Due to small sample size of participants who did not get vaccinated (n = 29), group differences in Time 2 were reported using the effect size of the dependent measures (Cohen’s D). All statistical procedures were conducted using SPSS version 25. In addition, sensitivity, specificity, positive and negative predictive value of the C-19 VHS for getting vaccinated were calculated.

3. Results

Vaccinated and unvaccinated patients were compared for differences in the study variables. The study groups did not differ in their fear of

Covid-19 levels and in their OQ-45 total score. A significant difference was found in their C-19 VHS scores (t(49) = 2.51, p = 0.02), indicating that vaccinated patients scored higher (Mean = 3.79; SD = 0.73) on the C-19 VHS scale compared to the unvaccinated patients (Mean = 3.15, SD = 1.07) (Table 2).

Among the unvaccinated participants, 14 stated they were willing to get vaccinated later on, while 12 stated they had no such intention. An effect size calculation was performed to assess for differences between participants who intended to get vaccinated and participants who did not. As shown in Table 3, a small to medium effect size was found in C-19 VHS scores (Cohen’s d = 3.47) while no effect sizes were found in the Fear of Covid-19 mean score or in the OQ-45 mean score. Once again, participants who indicated they have an intention to get vaccinated had higher C-19 VHS mean scores (Mean = 4.09, SD = 0.57) compared to participants who did not intend to get vaccinated (Mean = 2.18, SD = 0.53).

We analyzed the data of 26 patients who did not get vaccinated while participating in the study (Time 1) and completed the questionnaires (Time 2). As can be seen in Fig. 1, 20 out of 26 respondents (77%) acted in a manner responsive to their initial intention. Altogether, out of 51 patients 39 were vaccinated (76%).

For patients who were not vaccinated when recruited, we compared the predication of being vaccinated based on having a higher than median C-19 VHS score. It had 65% sensitivity, 73% specificity, 79% positive predictive value (PPV), and 57% negative predictive value (NPV). The straightforward inquiry i.e., expressing an intention to get vaccinated at a later time had 75% sensitivity, 80% specificity, 86% PPV, and 67% NPV.

4. Discussion

First, the current pilot study shows that vaccinating psychiatric inpatients in the psychiatric wards is feasible and, in our view, an important contribution to patients’ health and safety during the Covid-19 pandemic. Our study aimed at a unique, hard to recruit, vulnerable patient group. Although in a rather small patient group, the findings suggest that the majority of patients suffering from a severe mental illness are willing to get vaccinated. Many of those who did not vaccinate immediately were willing to vaccinate later while hospitalized or in their respective communities.

Although the study population was composed of highly distressed patients, it is important to stress that patients who were willing to get vaccinated were not different from those who chose not to get vaccinated in terms of clinical condition as reported by the patients (OQ-45), level of symptoms or fear of Covid-19. These data support the understanding that the patients’ decision of whether or not to get vaccinated is based on their viewpoint. In this respect, psychiatric inpatients seem to be similar to the general population. These preliminary findings support the ethics of providing the vaccine voluntarily while being hospitalized.

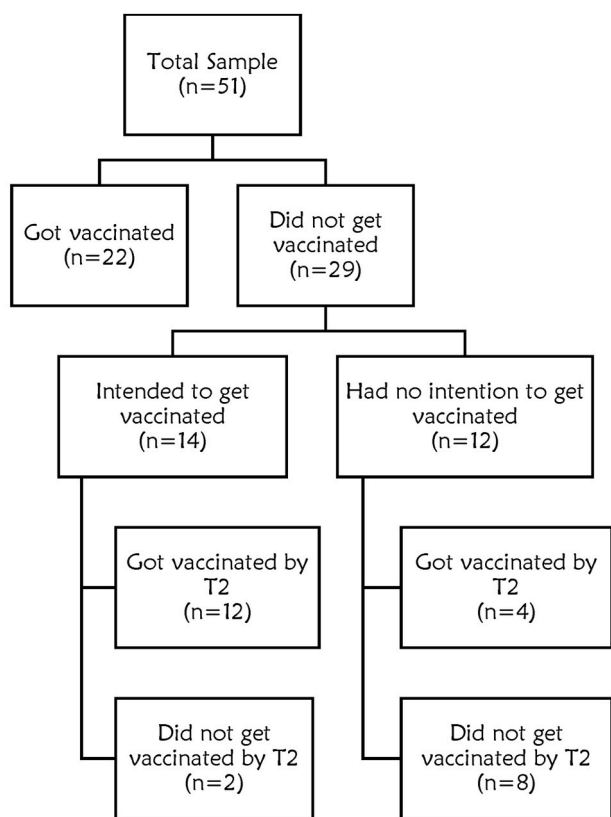
The willingness of the general population to get vaccinated is considered to have a pivotal role in dealing with the Covid-19 pandemic, and has become a focus in recent research (Freeman et al., 2020; Finney Rutten et al., 2021; Coustasse et al. 2021). The influence of mistrust towards society and authorities, suspiciousness, and disregarding scientific evidence have been marked as central contributors to the

Table 2
Between-group differences of study variables (patients vaccinated for Covid-19 compared to patients unvaccinated for Covid-19).

Variable	Vaccinated (=22)	Did not get vaccinated (n = 29)	P
Fear of Covid-19 scale	2.32 (0.98)	1.92 (1.02)	0.16
OQ-45 Total mean	84.31 (30.50)	82.61 (35.20)	0.86
VHS Covid-19 adapted	3.79 (0.73)	3.15 (1.07)	0.02

Table 3
Between-group differences of study variables (patients who intended to get vaccinated for Covid-19 compared to patients who did not have the intention to get vaccinated for Covid-19).

Variable	Intended to get vaccinated (n = 14)	Did not intend to get vaccinated (n = 12)	Cohen's D
Fear of Covid-19 scale	1.91 (0.96)	1.89 (1.16)	0.02
OQ-45 Total mean	80.71 (36.76)	85.08 (37.77)	0.18
VHS Covid-19 adapted	4.09 (0.57)	2.18 (0.53)	3.47



* T2 represents Time 2 (one month after baseline)

Fig. 1. Study flow presenting the recruitment process of study participants*. *T2 represents Time 2 (one month after baseline).

hesitance (Germani and Biller-Andorno 2021; Freeman et al., 2020). Since many of these attitudes are common in severe mental states, especially in psychotic disorders and severe personality disorder, it was likely to see an effect on opposing the vaccine. The results of the present study do not support such an effect. As a group, the attitude of our patients was not affected by the severity of their symptomatology as they perceived it., and having a psychotic, bipolar or personality spectrum disorder was not a predictor of attitude towards being vaccinated. However, this observation should be taken with a grain of salt, as the diagnostic groups are very small. Still, even with these small groups, there were significantly more patients suffering from anxiety who did get vaccinated, supporting a possible connection between fear of Covid-19 and the attitude towards being vaccinated. In our study, the “fear of Covid-19” was not linked to the attitude towards being

vaccinated. Thus, the attitude of our patient group to vaccination is very similar to that of the general population, with 70% of patients in the study group being vaccinated or intended to be vaccinated, similar to survey findings in the general population (Freeman et al., 2020), including in Israel (Dror et al., 2020; Shmueli, 2021). As in the general population, the decision was related mainly to the attitude towards the vaccination itself, rather than the fear of Covid-19 (Karlsson et al., 2021).

In addition to the questionnaires, patients were asked if they had an intention to get vaccinated. Their answers seem to be a good predictor of their actual decisions, providing valuable information for planning the number of vaccines needed. An encouraging detail is that some of the patients who initially had no intention to get vaccinated, did opt to get vaccinated eventually, without any further solicitation or compulsion.

As previously mentioned, patients suffering from severe mental illness are physically and socioeconomically vulnerable to infection, and morbidity and mortality due to Covid-19. Our study demonstrates the importance of providing vaccination accessibility to hospitalized patients, and more so, the need to consider their viewpoints and opinions. Since it seems that vaccination hesitancy is an important factor in the decision whether to get vaccinated, it is imperative to target the different components of attitude against vaccination as reflected in the C19-VHS questionnaire, such as lack of confidence in the need to be vaccinated, risk perception and fear of side effects. Further large scale studies are needed to investigate the reasons for patients’ attitude towards being vaccinated, possibly studying whether specific items in the C19-VHS reflect specific viewpoints or disinformation and can guide attempts to lower hesitancy and improve vaccination rates.

5. Study limitations

The main limitation of the study is its small sample size, enabling to detect a large effect only. Additionally, we lack information about what persuaded those who were reluctant to vaccinate.

Author statement

1. Substantial contributions to the conception or design of the work; Yuval Bloch, Renana, Danenberg Sharon Shemesh, Hagai Maoz, Dana Tsur-Bitan Libi Hertzberg and or the acquisition of the data, Yuval Bloch, Sharon Shemesh, Dana Tsur-Bitan, Hen Dror and or interpretation of data for the work Yuval Bloch, Sharon Shemesh, Renana Danenberg, Talia Saker, Hagai Maoz, Dana Tsur-Bitan. Libi Hertzberg
2. Drafting the work or revising it critically for important intellectual content;; Yuval Bloch, Renana, Danenberg, Sharon Shemesh, Hen Dror, Talia Saker Hagai Maoz, Dana Tsur-Bitan Libi Hertzberg
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4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Yuval Bloch, Renana, Danenberg, Sharon Shemesh, Hen Dror, Talia Saker Hagai Maoz, Dana Tsur-Bitan Libi Hertzberg

All authors have made a substantial contribution to the attached study and fulfilled the four required criteria.

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Declaration of competing interest

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Appendix A

English version of the COVID-19 Vaccine Hesitancy Scale (C19-VHS).
How much do you agree with the each of the following statement on vaccinations?

	Strongly disagree 1	Disagree 2	Neither agree nor disagree 3	Agree 4	Strongly agree 5
1. COVID-19 vaccines are important for my health	1	2	3	4	5
2. COVID-19 vaccines are effective	1	2	3	4	5
3. Being vaccinated for COVID-19 is important for the health of others in my community	1	2	3	4	5
4. All COVID-19 vaccines offered by the government program in my community are beneficial	1	2	3	4	5
5. New COVID-19 vaccines carry more risks than older vaccines	1	2	3	4	5
6. The information I receive about COVID-19 vaccines from the vaccine program is reliable and trustworthy	1	2	3	4	5
7. Getting vaccines for COVID-19 is a good way to protect myself from the disease	1	2	3	4	5
8. I plan to do what my doctor or health care provider recommends about COVID-19 vaccines	1	2	3	4	5
9. I am concerned about serious adverse effects of COVID-19 vaccines	1	2	3	4	5

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