Correspondence

No psychological vaccination: Vaccine hesitancy is associated with negative psychiatric outcomes among Israelis who received COVID-19 vaccination

A B S T R A C T

Background: The widespread COVID-19 vaccination program, issued by the Israel Government, provides a unique opportunity to examine psychiatric morbidity and vaccine attitudes among individuals who have already been vaccinated. Accordingly, the current study examined how vaccine hesitancy contributes to clinical levels of depression, anxiety, and peritraumatic stress among individuals who had received COVID-19 vaccinations.
Methods: We analyzed data obtained from 254 vaccinated individuals, and assessed vaccine hesitancy, depression, anxiety, and peritraumatic distress, as well as several demographic, health, and COVID-19-related factors.
Results: Logistic regressions demonstrated that above and beyond socio-demographic, health, and COVID-19-related factors, COVID-19 vaccine hesitancy was the most prominent risk factor for anxiety, depression, and peritraumatic distress. Higher levels of vaccine hesitancy were found to double the risk for depression and peritraumatic stress (ORs > 2), and to triple the risk for anxiety (OR > 3).
Limitations: A cross-sectional design; a preliminary study requiring further investigation
Conclusions: This study points to the importance of vaccine hesitancy among vaccinated populations and provides knowledge regarding its associations with negative psychiatric outcomes. These findings may offer important information for healthcare practitioners and policy makers in their attempt to encourage individuals to receive COVID-19 vaccinations and emphasize the need to further understand the underlying mechanisms of psychiatric morbidity among vaccinated individuals.

1. Introduction

Israel has become one of the first countries to initiate a widespread operation aimed at providing SARS-CoV-2 virus (COVID-19) vaccinations to all adults (Ministry of Health, 2021). Despite the dire physiological and psychological consequences of this global pandemic (e.g., Palgi et al., 2020), prospective studies demonstrate significant concerns and hesitation regarding COVID-19 vaccination before the vaccine become available (Palamenghi et al., 2020). Vaccine hesitancy (VH), negative attitudes, reluctance or even refusal to be vaccinated, is considered a major global health threat to the worldwide efforts to deal with COVID-19 (Taylor et al., 2020). Such hesitations may stem from general mistrust in science, conspiratorial attitudes, or overvalued ideas regarding the safety of the vaccine. It is unclear whether this phenomenon represents mental health psychopathology or normative (albeit not mainstream) ways of thought (Fusick et al., 2020). The novel vaccination opportunities in Israel enable us to examine the connections between VH and psychiatric morbidity among individuals who have chosen to receive COVID-19 vaccinations. This association is crucial, as it may help in understanding factors which characterize individuals who, despite receiving the vaccination, continue to hold high levels of VH.

Following the above, the present study aimed at examining the association between VH and mental health measures (i.e. anxiety, depressive and peritraumatic distress symptoms) among vaccinated individuals. To the best of our knowledge, the present study is the first to evaluate these relations among participants who were vaccinated for the COVID-19 virus.

2. Methods

Data for the present study were collected by using the Qualtrics web-based public platform and via social-media platforms, a week after the beginning of the vaccination operation in Israel from January 1st to February 1st, during which Israel was in lockdown. By the end of the collection period, over 3 million Israeli citizens (or 34.5% of the population) had received the first dose (Ministry of Health, 2021). Vaccinations during this period were targeted to the in-threat population, individuals above 60 and health care teams. Out of 385 participants who electronically gave their informed consent, our sample includes 254 participants who received at least their first vaccination (age=60.04±15.44, range 24-100 years old). Most were women (n=151, 59.4%), married/cohabitating (n=188, 74.0%) and had tertiary-education (n=138, 54.5%). Participants completed a demographic questionnaire including age, gender, relationship status, education, religiosity, self-rated health, diagnosis of chronic medical conditions related to increased risk of COVID-19 complications, level of exposure to eight COVID-19 related risk situations (e.g., being infected), COVID-19 conspiration beliefs (e.g., the COVID-19 is a genetic engineering virus made for population dilution), general attitudes toward vaccinations (e.g., refusal to vaccinate your child in the past), COVID-19 vaccine hesitancy (VH, mean of 8 items α=.833; adapted from Giambi et al. (2018). Dependent variables were general anxiety (GAD-7, sum of 7 items, α=.931; Spitzer et al. (2006), depression (PHQ-9, sum of 9 items, α=.903; Kroenke et al., 2001), and peritraumatic distress (PDI, sum of 13 items α=.906; Brunet et al., 2001). Ethical approval was received from the

authors IRB \the University of Haifa and Bar-Ilan University.

3. Results

VH was positively correlated with GAD-7, PHQ-9 and PDI (.25 ≤ r ≤ .38, ps<.0001). Using the accepted cutoff points for clinical levels of GAD-7 (≥10; n=23, 9.1%), PHQ-9 (≥10; n=24, 9.1%) and PDI (≥14; n=57, 22.6%), we conducted logistic regressions, which indicated that after controlling for aforementioned demographic and health-related factors, exposure to COVID-19, COVID-19 vaccine conspiracy, and general attitudes toward vaccinations, VH was the most prominent risk factor for clinical levels of anxiety (OR=3.620, 95% CI: 1.610-8.141, p=.002), depression (OR=2.243, 95% CI: 1.099-4.580, p=.027), and peritraumatic distress (OR=2.289, 95% CI: 1.290-4.061, p=.005) among vaccinated individuals. For further information, see Table 1. The results remained significant when analyses were conducted without covariates.

4. Discussion

The results demonstrate that among vaccinated individuals, higher levels of VH were related to higher level of anxiety, depression and peritraumatic distress. These findings support the notion that holding ambivalent attitudes toward vaccination are related to mental health morbidity (Fusick et al., 2020). Furthermore, it seems that receiving COVID-19 vaccinations does not eliminate the effect of VH on psychiatric morbidity, and that some individuals who report VH continue, despite their decision to receive the vaccine, to demonstrate clinical levels of anxiety, depression, and stress, possibly due to their fears regarding its safety and long-lasting effects (Palamenghi et al., 2020).

Although the generalizability of these results is limited due to the cross-sectional design and possible situational factors (e.g., lockdown), they offer innovative and pioneering insights regarding possible psychiatric vulnerability of vaccinated individuals who hold high levels of VH. These results are the first to show these associations and may indicate the need for special psychiatric attention targeted at vaccinated individuals who display high levels of VH.

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Yuval Palgi[1], Yoav S. Bergman[2], Boaz Ben-David[*,3,4,5], Ehud Bodner[6,7]

[1] *Department of Gerontology, University of Haifa, Israel*
[2] *Faculty of Social Work, Ashkelon Academic College, Israel*
[3] *Baruch Ivcher School of Psychology, Interdisciplinary Center (IDC) Herzliya, Israel*
[4] *Toronto Rehabilitation Institute, University Health Networks (UHN), ON, Canada*
[5] *Department of Speech-Language Pathology, University of Toronto, Toronto, ON, Canada*
[6] *Interdisciplinary Department for Social Sciences, Bar-Ilan University, Israel*
[7] *Department of Music, Bar-Ilan University, Israel*

[*] Corresponding author at: Communication, Aging and Neuropsychology Lab (CANlab), Baruch Ivcher School of Psychology, Interdisciplinary Center, Herzliya, P.O. Box 167, Herzliya, 4610101, Israel.
E-mail address: boaz.ben.david@idc.ac.il (B. Ben-David).

Table 1
Univariate Logistic Regression Analyses.

Variable	Univariate Logistic Regressions, Likelihood of Diagnosis (separately) Relative to No Diagnosis		
	GAD-7 cutoff, (21 vs. 218) OR (95% CI)	PHQ-9 cutoff, (21 vs. 218) OR (95% CI)	PDI cutoff, (52 vs. 185) OR (95% CI)
Age	.963(.923-1.005)	.979 (.941-.1.018)	.998 (.970-1.026)
Gender[a]	3.333(.992-11.199)	1.107(.396-3.098)	1.307(.626-2.731)
Marital status[b]	1.704(.492-5.899)	.691(.235-2.030)	.725(.334-1.571)
Education[c]	.480(.301-.767)**	.625(.418-.936)*	.849(.638-1.131)
Religion[d]	1.047(.290-3.778)	.845(.231-3.098)	1.143(.453-2.883)
Self-rated health[e]	.887(.480-1.639)	.584(.334-1.021)	.545(.359-.826)
Chronic medical conditions[f]	1.641(.425-6.342)	1.962 (.574-6.704)	1.529(.647-3.610)
COVID-19 conspiration beliefs	.899(.521-1.554)	.901 (.534-1.522)	1.099(.759-1.593)
Exposure to COVID-19 related situations	1.053(.719-1.542)	1.003 (.697-1.445)	1.138(.872-1.484)
General attitudes toward vaccinations	.433(.138-1.353)	.978(.486-1.967)	1.320(.824-2.112)
COVID-19 vaccination hesitancy	3.620(1.610-8.141)**	2.243(1.099-4.580)*	2.289(1.290-4.061)**

Note: Total N= 239, 239, 237 respectively. [a]= female. [b]= currently married, or living with a partner. [c]= six education levels from 1) preprimary education to 6) tertiary education. [d]= Jewish. [e]= from 1) not good at all to (5) very good. [f]= Yes.
*p< .05, **p < .01.