Journal of Public Mental

The reluctance to the vaccine, mental health, fear of Covid-19 and quality of life among Palestinians: an exploratory comparative study in different geographical areas

Journal:	*Journal of Public Mental Health*
Manuscript ID	JPMH-02-2023-0016.R3
Manuscript Type:	Original Research Paper
Keywords:	Reluctance of the vaccine,, mental health, quality of life, fear of Covid-19, Palestinian population

The reluctance to the vaccine, mental health, fear of COVID-19 and quality of life among Palestinians: an exploratory comparative study in different geographical areas

The reluctance to the vaccine, mental health, fear of COVID-19 and quality of life among Palestinians: an exploratory comparative study in different geographical areas

Abstract

Purpose

Our work sought to explore the effect of mental health in terms of depression, anxiety, stress, fear of COVID-19, and quality of life on the reluctance to be vaccinated in a population of Palestinian adults living in occupied Palestinian territories and Israel.

Design/methodology/approach

We recruited 1122 Palestinian adults who consented to participate in the study; 722 were females, and the mean age of the sample was 40.83 (SD 8.8). *DASS, WHOQoL- BREF, FCov-19, and reluctance to the vaccine scale* were administered; hierarchical regression analysis was applied to test vaccine reluctance as a dependent variable, mental health, fear of COVID-19, and quality of life as independent variables. We hypothesized an influence of such variables on the vaccine choice with differences due to the participants' geographical locations.

Findings

Findings showed an effect of mental health, particularly depression, QoL and fear of COVID on vaccine reluctance, with depression and fear of COVID in the West Bank and Gaza, while in Israel, QoL played a role in vaccination choices.

Originality/value

Our results demonstrated the importance for public mental health to consider the multiple levels implied in the vaccine refusal in Palestine and Israel among the Palestinian population.

Keywords: Reluctance of the vaccine, mental health, quality of life, fear of COVID-19, Palestinian population.

Introduction

The COVID-19 pandemic spurred research and development for new vaccines (Le et al., 2020). Mass vaccination campaigns were launched, but a critical gap in healthcare systems emerged between the Global North and South, causing disparities in access to vaccines (Singh & Chattu, 2021). In 2021, approximately 600 million vaccine doses were distributed, with 80% of the global population receiving only 5% of the vaccines (Tatar et al., 2021; Our World in Data, 2021). Poor and non-white individuals were at greater risk of exclusion from vaccination, while high GDP countries in the Global North were fully covered (Basak et al., 2022). Reluctance to the vaccine was relatively low in the Global South (Solis Arce et al., 2021).

Several studies have explored the influence of psychological predictors and environmental factors on individuals' willingness to receive vaccinations (Feleszko et al., 2021; Parimi et al., 2022). Notably, regional disparities have been examined to determine if they contribute to variations in vaccine acceptance (Abedin et al., 2021; Ba et al., 2022; Kricorian, Civen, & Equils, 2022; Nguyen et al., 2022). However, recent findings have indicated that free and paid vaccination acceptance does not differ significantly across regions (Campos-Mercade et al., 2021; Jecker, 2022). This suggests that the effects of psychological predictors on vaccine acceptance are independent of the environmental context.

For example, regarding Malaysians, the perceived effectiveness of vaccination in controlling the COVID-19 pandemic appears to be a significant factor. When Malaysians perceive the vaccine as an effective preventive measure against COVID-19, their inclination to seek free vaccination increases. Moreover, it is worth noting that while fear of COVID-19 predicts vaccination endorsement, its predictive power is comparatively weaker compared to the vaccine's perceived effectiveness (Lee, 2022).

These findings highlight the importance of investigating psychological predictors and their impact on vaccine acceptance, as well as understanding the interplay between individual beliefs, regional factors, and the effectiveness of vaccines in controlling the pandemic. By shedding light on these factors, interventions and policies can be developed and targeted effectively to promote vaccine uptake and ultimately contribute to achieving global herd immunity.

Hesitancy to get vaccinated has been linked with deteriorated living conditions, low quality of life (QoL), mental health, and ethnicity worldwide. In a study carried out in Britain on more than 20.000 individuals belonging to minority groups, Asian and black, females with lower educational and economic status were more at risk of refusing the vaccination (Chauduri et al., 2022). In a sample of Indian adults, 36% were hesitant, and 6% were against the vaccine (Umakanthan et al., 2021).

A study focussing on the existing literature on COVID-19 hesitancy worldwide used both a Principal Component Analysis (PCA) and thematic qualitative analysis to identify factors related to COVID-19 vaccine refusal. When comparing the results of the two approaches, it was found that six out of the eight factors matched. The most frequently discussed factor in the literature was the safety and effectiveness of the vaccine, with a total of 88 themes classified under this factor. The second most commonly discussed factor was

mistrust, with 72 associated themes. The third factor, which was discussed with relative frequency, pertained to the socioeconomic characteristics of the people, with a total of 52 related themes extracted (Ochieng et al., 2021).

Anxiety, depression and stress dramatically increased during the pandemic, contributing to a global mental health emergency during and after the virus outbreak (Brooks et al., 2020; Shevlin et al., 2020). In a survey carried out in Canada and the US (Turna et al., 2021), 30.7% of the sample reported anxiety symptoms against 19.6% and 35. 1% reported in previous research in China (Zhang et al., 2020; Huang & Zao, 2020). Depression was detected in 29.4% of the sample against 9.8% and 48.3% in a Chinese sample (Zhang et al., 2020; Gao et al., 2020). According to a survey conducted by Turna et al. (2021) in Canada and the US, 30.7% of the sample reported experiencing anxiety symptoms. This percentage differs from the rates reported in previous research conducted in China by Zhang et al. (2020) and Huang & Zao (2020), where 19.6% and 35.1% of the participants, respectively, reported anxiety symptoms. Accordingly, similar results were obtained in American, Indian, and Iranian samples (Gallager et al., 2020; Khademian et al., 2021; Rehman et al., 2020).

In Palestine, according to the results provided by Radwan et al. (2021), the majority of students involved in the research experienced moderate to severe levels of anxiety (89.1%) and depression (72.1%), while less than half (35.7%) experienced moderate to severe stress. The scores for stress, anxiety, and depression were significantly different based on gender, age group, family size, and family economic status. Age, and family's economic level were negative predictors correlated with stress, whereas family size positively affected stress. The study also found that concerns about COVID-19's impact on the economy, education, and daily life were positively correlated with depression, anxiety, and stress; and the availability of social support had a negative correlation (Radwan et al., 2021). Mahamid et al. (2023) also discovered a positive and significant correlation between COVID-19-related fear and mental

health outcomes and a negative correlation with perceived emotional support, support seeking, and received support in a Palestinian population.

Mental health played a role in the attitudes of individuals sceptical toward the vaccine (Smith et al., 2021); in particular, people with previous mental health conditions showed less fear of the infection and refusal of the new generation vaccine with adherence to specific conspiracy theories (Gibbon et al., 2021; Paul et al., 2021).

As for our study, the Palestinian case shows some peculiarity due to the ongoing military occupation, low-intensity conflict, and chronic discrimination (Peteet, 2016). According to available data, the total Palestinian population is comparable in size to the total Israeli Jewish population (Zureik, 2023).

The COVID -19 outbreak exacerbated the critical living conditions of the population, increasing mental distress and a sense of isolation and exclusion with limited access to vaccines and other medical supplies (e.g. only 3% of the Gaza population was vaccinated in 2021) to curtail the pandemic (Shoib et al., 2021). On the other hand, despite a lack of statistics, research in the region revealed a concerning resistance to vaccination and scepticism on the new generation vaccine mainly due to the Israeli control of the distribution and availability of the doses (Kateeb et al., 2021; Maraqa et al., 2021; Abu-Odah, et al., 2022). Accordingly, an association between mental health conditions, such as anxiety, depression, and stress, with vaccine refusal was found in Gaza (Hamdouna & Al Masri, 2022). Finally, people with lower quality of life were more exposed to mental burdens related to the fear of the virus (Mahamid et al., 2021).

Moving from the premises mentioned earlier and considering the peculiarity of a context under military occupation, our study would investigate whether mental health, QoL,

and fear of the coronavirus might influence people's hesitancy to the vaccine in a Palestinian population living in the occupied Palestinian territories and Israel.

The Study

To our knowledge, up to date, no studies on the Palestinian population have been conducted to test the influence of mental distress, quality of life and COVID-19 fear on people's will to be vaccinated.

The peculiar conditions of the occupied Palestinian territories make this topic worthy to be covered even though it has been extensively studied worldwide. For 77 years, Palestine endured a chronic health and economic crisis due to the ongoing Israeli military occupation. Shortages of financial and material resources, health services and supplies severely affected the civil population's mental well-being and quality of life (Giacaman et al., 2011). Gaza has lived under an almost complete military blockade since 2007 that severely compromised the resources to cope with social suffering and disruption of QoL (Elessi et al., 2019). The West Bank and East Jerusalem experience an acute crisis impeding sustainable development due to settler-colonial violence (the settlers primarily consist of Israeli Jewish settlers), territorial discontinuity and military occupation (Giacaman et al., 2007). Finally, Palestinians in Israel live in disadvantaged conditions in terms of socioeconomic and educational opportunities, perceiving themselves as marginalized and racialized second-class citizens (Abo-Rass et al., 2020). If in the Palestinian territories, the QoL is severely compromised and impacts individuals' mental health, In Israel, social exclusion is quite common among the Palestinian communities (Rosenthal, 2021).

Accordingly, the military occupation severely influenced the vaccination campaign in the occupied territories. In fact, the Palestinians received adequate vaccine doses through donations from developed countries in the late phase of the outbreak. The vaccination

program was set to be implemented with the provision of free-of-charge and voluntary vaccinations. A certain amount of doses by donation (Pfizer and AstraZeneca, 43,200 doses for the West Bank, 28,800 doses for the Gaza Strip) were supplied through the COVAX campaign (Unicef, 2021). When the health authorities started an extensive vaccination campaign in Palestine, Israel was leading country for the 3rd dose (Martin & Arawi, 2021). Such a gap created two types of mass psychological reactions. First, people felt once again frustrated and neglected by the international community, considering that at the beginning of the WHO-launched global vaccine campaign, an insufficient batch of Xinovax (Chinese) and Sputnik (Russian) donated stocks were available in oPts. In the late phase of the global vaccination campaign, most of the available doses were provided by the Ministry of Health, with AstraZeneca, prohibited in Europe, and minimum availability of Pfizer and Johnson & Johnson stocks (Howard & Schneider, 2022; Watt et al., 2021). Second, a late Israeli campaign of vaccination support of oPt through cooperation with the Palestinian Authority favoured rumours and complot theories among the population of an attempt of mass poisoning and control through the vaccine by the occupier. Accordingly, psychological stress due to the occupation and QoL disruption might have potentiated such negative attitudes against vaccination. Moreover, in Israel, Palestinians sympathized with their ethnic group in the territories and showed mistrust for the governmental authorities (Ali-Saleh et al., 2023).

The Palestinian people's reluctance to receive the COVID-19 vaccine can be attributed to two main factors. Firstly, the spread of false rumours, misinformation, and complot theories on social media causing panic and fear among the population. Secondly, there is a sense of mistrust towards the vaccines that the government has purchased. The exaggeration of the vaccine's side effects has also contributed to this reluctance (Abu-Odah & Musa, 2022).

In the present study, we sought to explore the main independent variables predicting the reluctance toward the vaccine: quality of life (QoL), mental distress (depression, anxiety, and stress), and fear of COVID-19. Those predictors were tested both in the whole population, made of Palestinian adults, and in specific territorial entities, West Bank (WB), Gaza Strip and East Jerusalem (EJ) in the occupied Palestinian territories (oPts), and Israel. We hypothesized a prediction effect of mental health, QoL, and fear of COVID-19 on vaccine hesitancy (H1). Secondly, we hypothesized differences in the contexts. We expected a prevalence of mental distress and fear of COVID in the occupied territories (WB, Gaza Strip, and EJ) (H2), while an effect of mental distress and QoL in the Israeli sample of Palestinian descendants (H3).

Methods

Participants

The study recruited Palestinians living in the oPt and those living in Israel. The participants were selected online using social media networks like Facebook and Twitter, e-mails, and online advertisements. The Google Form used in the study was distributed online by the study authors and a wide circle of colleagues and friends to reach a broad audience that represents the studied populations. All participants had to be of Palestinian origins, Arabic native speakers, currently living in the oPt, East Jerusalem and Israel, and free of severe mental and neurodevelopmental conditions such as psychosis or personality disorders.

Instruments and procedures

The study was conducted from December 2021 to May 2022, during which the Palestinian Ministry of Health actively carried out the COVID-19 vaccination programme. The convenience sampling method was used to recruit the participants to the study using an

online Google Form, which included a description of the study, the scales used, and the intended objectives of the study. We considered completing the online questionnaire as giving consent to participate in the study, which was conducted following the guidelines of the Declaration of Helsinki (2013) and the American Psychological Association (2010). The study had been approved by the Institutional Review Board at An-Najah National University (Protocol INTR June 2022/9)

We utilized four different instruments to test the abovementioned hypotheses. To ensure linguistic accuracy and reliability, *the COVID-19 Vaccine Acceptance Scale (VAC-COVID-19)*, which had not been previously validated in Arabic, underwent a translation process from the original English version to Arabic and then back-translated to Arabic. This process aimed to verify the linguistic accuracy and reliability of the scale in its translated form. The Arabic instruments were pilot-tested by native Arabic-speaking experts in psychology, counselling and social work. They evaluated the instruments for their clarity and relevance in content and language. An expert English-Arabic translator and editor did the translation back to English. Finally, the translated Arabic version was pilot-tested among 70 participants, who helped further refine the instruments' clarity.

Depression, Anxiety and Stress (DAS-21) Scale: a 21-item self-reported instrument that utilizes Likert-type questions graded 0 (did not apply to me at all over the past week) to 3 (applied to me very much or most of the time over the past week) for the presence over the previous week of particular symptoms and manifestations that are common in depression and anxiety disorders. The instrument was initially designed and developed by Lovibond and Lovibond (1995) to assess the severity of the main symptoms of depression, anxiety and distress.

World Health Organization Quality of Life Instrument (WHOQOL-BREF): a shorter version of the longer WHOQOL-100 questionnaire, developed by the World Health Organization (1996), to test one's health and quality of life, whether there is active disease or not. It is a self-administered questionnaire comprising 26 questions examining perception of health and well-being over the previous two weeks. The instrument also utilizes Likert-scale questions graded from 1 (not at all) to 5 (an extreme amount). The scale has an upward scoring system, with higher scores indicating a better quality of life.

Fear of COVID-19 Scale (FCV-19S): a self-reported instrument that assesses fear of COVID-19 among individuals. It comprises seven items that explore emotions of fear towards the COVID-19 pandemic. The items are graded from 1 (strongly disagree) to 5 (strongly agree), with a total score ranging from 7 to 35. The higher scores increase a higher degree of fear of COVID-19. Ahorsu et al. (2020) developed the instrument early in the pandemic and showed acceptable internal validity with a Cronbach's alpha of 0.82.

The COVID-19 Vaccine Acceptance Scale (VAC-COVID-19): Developed by Mejia et al. (2021) to assess attitudes, beliefs, and behaviours towards the COVID-19 vaccines. We utilized 11 items of the scale grouped into two categories: items 1 – 7 explored reasons for not accepting/receiving the vaccine, and items 8 – 11 explored reasons for accepting/receiving the vaccine. All items were graded from 1 (never) to 5 (always). Higher scores indicate a higher degree of reluctance towards the vaccine.

Data Analysis

We utilized hierarchical linear regression analysis to generate models that predict the impact on the level of reluctance to the vaccine as an outcome variable of various predictors, namely symptoms of depression and anxiety, quality of life, and fear of COVID-19. Regression analysis was carried out to understand what predicts vaccine hesitancy among the

Palestinian population. The analysis was conducted based on geographical location to generate more relevant and specific models given the different contexts under which they live. Additionally, Pearson Correlation was calculated to explore the association between the predictor variables (depression, anxiety, stress, quality of life, and fear of COVID-19) and the outcome variable (reluctance to the vaccine).

To ensure accuracy, we checked all variables for assumptions related to hierarchical regression, such as homogeneity of the variance and multivariate normality. We found no significant violations of normality. We also identified and excluded three extreme multivariate outliers using Mahalanobis' distance ($p < 0.001$). Additionally, we verified that all scores were normally distributed and found that none of the variables displayed kurtosis or skewness values outside the recommended range of -2 to +2 (as recommended by George and Mallery, 2021). The analysis was carried out using SPSS version 26.

Results

Nearly 70% of the participants resided in cities, 19.7% in villages, and 11.1% in Palestinian refugee camps. Almost half of the sample came from the Gaza Strip, 35.5% from the West Bank, 9.5% from Israel, and 5.1% from East Jerusalem. The sample was relatively educated; 53.7% completed a bachelor's degree, 31.8% held a master's degree, and 14.5% were educated up to secondary school.

Table 1 shows the descriptive statistics about the measures and scales used: Depression, Anxiety, Stress, WHOQOL, Fear of COVID-19, and Reluctance to the COVID-19 vaccine. Participants reported relatively high scores on the WHOQOL, indicating good quality of life. They also reported moderate scores on the DASS-21 components, with higher scores on symptoms of depression and stress sub-scales than anxiety. Scores of the FCV-19S were mild. The reliability of all the scales used in the study was high, with Cronbach's alpha

values exceeding 0.8 for each scale. The Stress scale had the lowest reliability coefficient of 0.82, while the Fear of COVID-19 Scale (FCV-19S) had the highest reliability coefficient of 0.91.

INSERT TABLE 1 ABOUT HERE

Prediction of Reluctance to COVID-19 vaccine

Reluctance to the vaccine was positively correlated with symptoms of stress, anxiety, depression and fear of COVID-19, while it negatively correlated with QoL, as shown in Table 2.

INSERT TABLE 2 ABOUT HERE

Linear regression analysis using a hierarchical method explored which factors predicted the reluctance to the vaccine in the study sample. The probability of F entering the model was set at ≤ 0.05, and F's probability of removing the variables from the model was ≥ 0.100. The regression analysis was used for the study sample as a whole and then categorized based on the geographical locations of the participants.

A hierarchical regression analysis was conducted to determine the predictors of vaccine hesitancy in the study population. Step 1 included gender, residence, age, and educational level, while Step 2 included symptoms of stress, anxiety, depression, quality of life, and fear of COVID-19. Analysis found several factors influencing vaccine reluctance. Firstly, gender significantly predicts reluctance to the vaccine, with females ($\beta = .10$; ** $p < .001$) exhibiting

a higher tendency towards reluctance. Additionally, residence plays a role, with camp residents (β = .08; ** p < .001) more likely to be reluctant than urban and rural residents. The educational level also contributes, as individuals with a high school degree (β = .15; ** p < .001) exhibit higher levels of reluctance compared to those with a Bachelor's (BA) or Master's (MA) degree. Finally, age is a factor, with the age category of 41-50 (β = .07; ** p < .001) displaying a greater reluctance to the vaccine compared to the age categories of 20-30 and 31-40. Moreover, our model showed that vaccination reluctance is predicted by symptoms of depression (β = .15; ** *p < .001*), fear of COVID (β = .11; ** *p < .001*), and QoL (β = .06; ** *p < .001*).

INSERT TABLE 3 ABOUT HERE

When the regression analysis was applied for each geographical region, the models changed with different predictors for each geographical region, as shown in Table 4. Symptoms of depression (β = .32; *** *p < .05*) was the significant predictor of the reluctance to the vaccine in the West Bank, whereas, in Gaza Strip, fear of COVID-19 (β = .14; *** *p < .05*) predicted the vaccination reluctance significantly. As for East Jerusalem, only symptoms of stress (β = .90; *** *p < .001*) entered the model and significantly predicted the vaccine's reluctance. Finally, Israeli Palestinians showed that vaccination reluctance predicted by symptoms of stress (β = .46; *** *p < .05*), QoL (β = .32; *** *p < .001*), and fear of COVID-19 (β = .272; *** *p < .001*).

INSERT TABLE 4 ABOUT HERE

Discussion

Our work sought to explore the effect of QoL, fear of COVID-19, and mental distress on the reluctance to be vaccinated in a sample of Palestinian adults living in different areas of so-called historical Palestine (Pappé, 2021), the West Bank, East Jerusalem, and Gaza Strip in the oPts (occupied Palestinian territories) and Israel. We entered the model with the selected independent variables both in the sample as a whole and for each separated territorial entity.

In Palestine, the profile of individuals who are more hesitant towards COVID-19 vaccination reveals that middle-aged women residing in refugee camps and with lower levels of education tend to exhibit greater scepticism when showing depression symptoms.

Our study, in line with previous international research (Asaoka et al., 2022; Palgi et al., 2021; Pan et al., 2022; Tsutsumi et al., 2021), found that mental health, particularly symptoms of depression, played a crucial role in vaccine choices among the Palestinian population, primarily in the West Bank. Disrupted living conditions in occupied Palestinian territories and the marginalization of the Palestinian minority in Israel further worsened the population's psychological well-being during the pandemic (Shoib et al., 2021; Veronese et al., 2021). Depressive symptoms appeared to be reactive to increased isolation and a significant gap between Palestinians and Israelis, contributing to vaccine hesitancy (Dahdal et al., 2021). Fear of COVID-19, influenced by depression symptoms, negatively impacted vaccine receptiveness.

Literature reports how mental health conditions influence fear of COVID-19 and expose individuals to more health-related risky behaviours (Veronese, Cavazoni et al., 2021).

Mental health showed its role as a predictor of vaccine refusal in all the Palestinian population in the region, with differences that might be discussed in the light of political condition. First, in the West Bank, the general trend was confirmed with depression as a crucial predictor. At the same time, Gaza showed COVID-19 anxiety as the pivotal condition that fostered concern about the infection and hesitancy toward vaccines (H2). WB is enduring a military occupation; those effects were exacerbated during the pandemic's first phase, augmenting people's sense of impotence and depression (Shadeed & Alawna, 2021). A sense of isolation, disconnection and dependency on Israeli authorities increased the population's mistrust and suspicion of vaccination campaigns. In May 2021, during the second wave of the infection, Gaza experienced a 10-day violent bombardment that destroyed the few vaccinal hubs in the Strip (Zarocostas, 2021). Thus, fear of COVID-19 and growing anxiety emerged as risk factors for vaccine acceptance in a context characterized by high uncertainty and acute violence (Devi, 2021). In East Jerusalem, violent repressions and evictions from homes impacted inhabitants' stress, most probably compromising the trust of the Israeli health authority and fostering scepticism, suspicion and refusal of the vaccine (Hawari, 2020; Samman & Saifi, 2020). Finally, the Palestinian-Arab population in Israel is facing marginalization and reduced access to resources compared to the Jewish citizens residing in Israel. Accordingly, QoL and stress played a crucial role, and the fear of COVID reduced the number of people seeking vaccination (Green et al., 2021; Saban et al., 2021).

Living in a refugee camp, characterized by significant disruptions to the quality of life and increased exposure to the burdens of military violence, appears to contribute to higher levels of vaccine reluctance among specific demographics.

In sum, mental health conditions, QoL and fear of COVID played a key role in fostering hesitancy for the vaccine among the population underlining the disparity between the disadvantaged Palestinian and the Israeli population.

We discuss some limitations. First, the cross-sectional study design prevented any causality inference and showed mere associations between the relevant variables included in the study. We need future research to understand better trajectories and changes over time in vaccine hesitancy and the aggravating role of mental distress, reduced quality of life and far of COVID-19. Online recruitment might not have allowed the study to include the most disadvantaged strips of the Palestinian population. However, the Israeli discrimination against the indigenous population affects the whole socioeconomic level of Palestinian society, making our results consistent with the reality on the ground in Israel and Palestine (Zureik, 2001). The sample size would have suggested using more complex statistical elaboration, such as Structural Equation modelling (SEM), instead of hierarchical regression analysis. However, SEM is a complex technique that requires a solid theoretical model and is better suited for analyzing complex systems with multiple latent variables. Currently, we are in the frame of an exploratory analysis: our goal is exploratory in nature; thus, linear regression allows for a more flexible approach. We can assess the relationships between variables without predefining a theoretical model, making it helpful in generating initial insights or hypotheses that we will test in a future conceptual model. Choosing a single outcome variable to pilot our research question, SEM, may be overly complex and unnecessary.

The quantitative exploration of vaccine hesitancy among Palestinians did not allow us to understand cultural, deeper religious, and even environmental constraints that could have exacerbated the refusal to vaccinate. Moreover, we must acknowledge that our instruments would not have precisely discerned from previous psychological conditions and those related to the COVID-19 outbreak among the population. Future qualitative and ethnographic studies will allow us to understand and deepen our findings' meaning.

Conclusions

Our findings revealed the crucial role of mental health (symptoms of depression and a minor role of anxiety and stress), fear of COVID-19 and QoL in increasing vaccine scepticism among the Palestinian population. The deteriorated living conditions in the occupied territories (West Bank, Gaza, and East Jerusalem) pose urgent concerns regarding Public Health and Public Mental Health (Ayyash, 2022). The collapse of the health system in Palestine did not favour positive attitudes toward vaccination and increased fear, depression and distress among the population (Bizri et al., 2021). Hence, public health and public mental health policies cannot avoid including human rights-related perspectives in promoting quality of life and well-being among the Palestinian population during and beyond the pandemic (Diab et al., 2018; Hammoudeh et al., 2020; Muhareb & Giacaman, 2020). Syndemia is the interaction and synergistic effects of two or more co-occurring health conditions -often due to social, economic and political antecedents and determinants- or epidemics, exacerbating their impact on a population (Horton, 2020); the syndemic nature of widespread COVID-19 urges a call for the international community to campaign for the immediate restoration of equity, self-determination and sustainability of the health system in the occupied territories and equal rights for the Palestinian population living in Israel.

Overall, COVID-19 fear and related psychological burdens among Palestinians lead to vaccine hesitancy and refusal in a context of surveillance and control ruled by the Israeli occupier.

As the occupying power, Israel is bound by international law to fulfil its duty of providing healthcare to the population living under occupation, including ensuring access to vaccinations during a pandemic (Watt et al., 2021). This obligation stems from the Fourth Geneva Convention, a cornerstone of humanitarian law, which outlines the protection of civilians in times of occupation and armed conflict (Imseis, 2003). While Israel did supply a

limited number of vaccines to the Palestinian Authority, the process has been criticized for its slow pace and lack of transparency (Howard & Shnaider, 2022; Watt et al., 2021).

The historical and ongoing political tensions, coupled with the impact of the Israeli occupation on the Palestinian quality of life, contribute to a sense of mistrust among some Palestinians. This scepticism can influence their decision-making regarding vaccinations, as they may question the underlying motivations or fear potential adverse consequences (Dahdal et al., 2021).

The absence of a significant relationship between quality of life (QoL) and vaccination hesitancy among the Palestinian population residing in occupied Palestinian territories (oPts) is a noteworthy finding, contrary to our initial expectations. One plausible explanation is that the QoL of this population is already extensively compromised. Therefore, any impact on vaccination choices is minimal, as there were no substantial changes in QoL during the pandemic.

Critics argue that Israel's control over the movement of people and goods into and within the occupied territories has hindered the Palestinian vaccination efforts. Additionally, some suspect that the limited supply of vaccines provided by Israel was a strategic move to assert control over the Palestinian population or to gain diplomatic leverage.

Israel contends that it has prioritized vaccinating its population first due to the urgency within its borders. They have also argued that the Oslo Accords, which govern the relationship between Israel and the Palestinian Authority, place responsibility for healthcare on the Palestinians themselves.

While we acknowledge that our results cannot be generalized, it is crucial to emphasize the significance of prioritizing quality of life and mental well-being. This holds true especially for populations experiencing stress, uncertainty, political and military

violence, marginalization, and racialization. Understanding the costs and benefits of a COVID-19 vaccination campaign becomes essential in these circumstances. We must globally address the interconnectedness of the COVID-19 syndemic (Horton, 2020) and its impact on public mental health, considering that individuals living in challenging conditions with compromised quality of life may exhibit increased fears regarding COVID-19 and experience reluctance towards vaccination.

References

Abedin, M., Islam, M. A., Rahman, F. N., Reza, H. M., Hossain, M. Z., Hossain, M. A., Arefin, A., & Hossain, A. (2021). Willingness to vaccinate against COVID-19 among Bangladeshi adults: Understanding the strategies to optimize vaccination coverage. *PloS one*, *16*(4), e0250495. https://doi.org/10.1371/journal.pone.0250495

Abo-Rass, F., Shinan-Altman, S., & Werner, P. (2020). Health-related quality of life among Israeli Arabs diagnosed with depression: the role of illness representations, self-stigma, self-esteem, and age. *Journal of Affective Disorders*, *274*, 282-288.

Abu-Odah, H., Su, J., & Musa, S. S. (2022). Unwillingness or reluctance of Palestinians to get the COVID-19 vaccine: the reasons behind it and how to persuade them. *International Journal of Infectious Diseases*, *119*, 53-55.

Ahorsu DK, Lin CY, Imani V, Saffari M, Griffiths MD, Pakpour AH. (2022). The Fear of COVID-19 Scale: Development and Initial Validation. International Journal of Mental Health Addiction, 20(3), 1537-1545. doi: 10.1007/s11469-020-00270-8.

Ali-Saleh, O., Bord, S., & Basis, F. (2023). Low response to the COVID-19 vaccine among the Arab population in Israel: Is it a cultural background, or a systemic failure, or maybe both?. *Journal of Racial and Ethnic Health Disparities*, *10*(1), 296-305.

Asaoka, H., Koido, Y., Kawashima, Y., Ikeda, M., Miyamoto, Y., & Nishi, D. (2022). Longitudinal change in depressive symptoms among healthcare professionals with and without COVID-19 vaccine hesitancy from October 2020 to June 2021 in Japan. Industrial Health, 60(4), 387–394.

Ayyash, M. M. (2022). Vaccine apartheid and settler colonial sovereign violence: from Palestine to the colonial global economy. *Distinktion: Journal of Social Theory*, 23 (2-3), 304-326.

Basak, P., Abir, T., Al Mamun, A., Zainol, N. R., Khanam, M., Haque, M. R., Milton, A.H. & Agho, K. E. (2022). A global study on the correlates of Gross Domestic Product (GDP) and COVID-19 vaccine distribution. *Vaccines*, *10*(2), 266. http://dx.doi.org/10.3390/vaccines10020266

Bizri, N. A., Alam, W., Mobayed, T., Tamim, H., Makki, M., & Mushrrafieh, U. (2021). COVID-19 in conflict region: the Arab levant response. *BMC Public Health*, *21*(1), 1-13.

Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet*, *395*(10227), 912-920.

Campos-Mercade, P., Meier, A. N., Schneider, F. H., Meier, S., Pope, D., & Wengström, E. (2021). Monetary incentives increase COVID-19 vaccinations. *Science*, *374*(6569), 879-882.

Chaudhary, F. A., Ahmad, B., Khalid, M. D., Fazal, A., Javaid, M. M., & Butt, D. Q. (2021). Factors influencing COVID-19 vaccine hesitancy and acceptance among the Pakistani population. *Human vaccines & immunotherapeutics*, *17*(10), 3365-3370.

Dahdal, Y., Davidovitch, N., Gilmont, M., Lezaun, J., Negev, M., Sandler, D., & Shaheen, M. (2021). Lessons of the Israeli-Palestinian Conflict for Public Health: The Case of the

COVID-19 Vaccination Gap. *International Journal of Environmental Research and Public Health*, *18*(21), 11292.

DeRoo, S. S., Pudalov, N. J., & Fu, L. Y. (2020). Planning for a COVID-19 vaccination program. *Jama*, *323*(24), 2458-2459.

Devi, S. (2021). COVID-19 surge threatens health in the Gaza strip. *The Lancet*, *397*(10286), 1698.

Diab, M., Veronese, G., Jamei, Y. A., Hamam, R., Saleh, S., & Kagee, A. (2018). Community work in the ongoing crisis context of Gaza: Integrating a public health and human rights approach. *Australian and New Zealand Journal of Family Therapy*, *39*(3), 320-330.

Elessi, K., Aljamal, A., & Albaraqouni, L. (2019). Effects of the 10-year siege coupled with repeated wars on the psychological health and quality of life of university students in the Gaza strip: a descriptive study. The Lancet 393, S10.

Feleszko, W., Lewulis, P., Czarnecki, A., & Waszkiewicz, P. (2021). Flattening the curve of COVID-19 vaccine rejection—an international overview. *Vaccines*, *9*(1), 44.

Gallagher, M. W., Zvolensky, M. J., Long, L. J., Rogers, A. H., & Garey, L. (2020). The impact of COVID-19 experiences and associated stress on anxiety, depression, and functional impairment in American adults. *Cognitive Therapy and Research*, *44*, 1043-1051.

Gao, J., Zheng, P., Jia, Y., Chen, H., Mao, Y., Chen, S., ... & Dai, J. (2020). Mental health problems and social media exposure during COVID-19 outbreak. *Plos one*, *15*(4), e0231924. https://doi.org/10.1371/journal.pone.0231924

George, D., & Mallery, P. (2021). *IBM SPSS statistics 27 step by step: A simple guide and reference*. Routledge.

Giacaman, R., Mataria, A., Nguyen-Gillham, V., Safieh, R. A., Stefanini, A., & Chatterji, S. (2007). Quality of life in the Palestinian context: An inquiry in war-like conditions. *Health policy*, *81*(1), 68-84.

Giacaman, R., Rabaia, Y., Nguyen-Gillham, V., Batniji, R., Punamäki, R. L., & Summerfield, D. (2011). Mental health, social distress and political oppression: The case of the occupied Palestinian territory. *Global public health*, *6*(5), 547-559.

Gibbon, S., McPhail, E., Mills, G., McBride, M., Storer, R., Taylor, N., & McCarthy, L. (2021). Uptake of COVID-19 vaccination in a medium secure psychiatric hospital population. *BJPsych open*, *7*(4). e108

Green, M. S., Abdullah, R., Vered, S., & Nitzan, D. (2021). A study of ethnic, gender and educational differences in attitudes toward COVID-19 vaccines in Israel–implications for vaccination implementation policies. *Israel Journal of Health Policy Research*, *10*(1), 1-12.

Hamdouna, O. S., & Al Massri, M. R. (2022). The mental health of university students to attitudes toward COVID-19 vaccination. *INSPIRA: Indonesian Journal of Psychological Research*, *3*(1), 8-16.

Hammoudeh, W., Kienzler, H., Meagher, K., & Giacaman, R. (2020). Social and political determinants of health in the occupied Palestine territory (oPt) during the COVID-19 pandemic: who is responsible?. *BMJ Global Health*, *5*(9), e003683.

Hawari, Y. (2020). COVID-19 in Palestine: A Pandemic in the Face of 'Settler Colonial Erasure'. *IAI Commentaries*, Rome, *20*, 62.

Horton, R. (2020). Offline: COVID-19 is not a pandemic. *The lancet*, *396*(10255), 874.

Howard, N., & Schneider, E. (2022). COVID-19 Vaccination in Palestine/Israel: Citizenship, Capitalism, and the Logic of Elimination. *Health and Human Rights*, *24*(2), 265-279

Huang, Y., & Zhao, N. (2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 outbreak in China: a web-based cross-sectional survey. Psychiatry research, 288, 112954.

Imseis, A. (2003). On the Fourth Geneva Convention and the occupied Palestinian territory. *Harv. Int'l LJ*, *44*, 65.

Jecker, N. S. (2022). What money can't buy: an argument against paying people to get vaccinated. *Journal of Medical ethics*, *48*(6), 362-366.

Kateeb, E., Danadneh, M., Pokorná, A., Klugarová, J., Abdulqader, H., Klugar, M., & Riad, A. (2021). Predictors of willingness to receive COVID-19 vaccine: cross-sectional study of Palestinian dental students. *Vaccines*, *9*(9), 954.

Khademian, F., Delavari, S., Koohjani, Z., & Khademian, Z. (2021). An investigation of depression, anxiety, and stress and its relating factors during COVID-19 pandemic in Iran. *BMC public health*, *21*(1), 1-7.

Khamsi, R. (2020). If a coronavirus vaccine arrives, can the world make enough? *Nature*, *580*(7805), 578-580.

Kricorian, K., Civen, R., & Equils, O. (2022). COVID-19 vaccine hesitancy: misinformation and perceptions of vaccine safety. *Human Vaccines & Immunotherapeutics*, *18*(1), https://doi.org/10.1080/21645515.2021.1950504

Lee, S. L. (2022). Facilitating free and paid vaccine acceptance in Malaysia: effectiveness of vaccine and fear of COVID-19. *Journal of Public Mental Health*, *21*(3), 262-270.

Le, T. T., Andreadakis, Z., Kumar, A., Román, R. G., Tollefsen, S., Saville, M., & Mayhew, S. (2020). The COVID-19 vaccine development landscape. *Nature Review of Drug Discovery*, *19*(5), 305-306.

Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour research and therapy*, *33*(3), 335-343.

Mahamid, F. A., Bdier, D., & Nablus, P. (2021). Fear of COVID-19 and mental health outcomes among psychosocial service providers in Palestine: The mediating role of well-being. *Journal of Concurrent Disorders*, *3*(1), 45-60.

Mahamid, F.A., Veronese, G. & Bdier, D. (2023). Fear of coronavirus (COVID-19) and mental health outcomes in Palestine: The mediating role of social support. *Current Psychology,* 42, 8572–8581.

Maraqa, B., Nazzal, Z., Rabi, R., Sarhan, N., Al-Shakhra, K., & Al-Kaila, M. (2021). COVID-19 vaccine hesitancy among health care workers in Palestine: A call for action. *Preventive Medicine*, *149*, 106618.

Martin, S., & Arawi, T. (2021). Ensure Palestinians have access to COVID-19 vaccines. *The Lancet*, *397*(10276), 791-792.

Mejia, CR, Rodriguez-Alarcon, JF, Ticona, D, Flores-Lovon, K, Paredes-Obando, M, Avalos-Reyes, MS, Ccasa-Valero, L., Carbaja, M., Carranza Esteban, R.F., Mamani-Benito, O., Rivera-Lozad, O., Tovani-Palone, M.R. (2021). Validation of a Scale to Measure the Perception of SARS-CoV-2 Vaccines Acceptance: The VAC-COVID-19 Scale. Electron Journal of General Medicine, 18(5). https://doi.org/10.29333/ejgm/11012. 23.

Muhareb, R., & Giacaman, R. (2020). Tracking COVID-19 responsibly. *The Lancet*. S0140-6736(20)

Our World in Data. Coronavirus Pandemic (COVID-19). Available at https://ourworldindata.org/coronavirus. Accessed: 5 April 2021.

Nguyen, L. H., Joshi, A. D., Drew, D. A., Merino, J., Ma, W., Lo, C. H., Wang, S, K., K., Graham, M.S., Polidori, L., Menni, C., Sudre, C. H., Anyane-Yeboa, A., Astley, C. M., Warner, E.T., Hu, C. Y., Selvachandran, S., Davies, R., Nash, D., Franks P. W., Wolf, J., Ourselin, S,, Steves, C. J.,. Spector, T. D., Chan, A, T., & COPE Consortium. (2022). Self-reported COVID-19 vaccine hesitancy and uptake among participants from different racial and ethnic groups in the United States and United Kingdom. *Nature communications*, *13*(1), 636.

Ochieng, C., Anand, S., Mutwiri, G., Szafron, M., & Alphonsus, K. (2021). Factors associated with COVID-19 vaccine hesitancy among visible minority groups from a global context: a scoping review. *Vaccines*, *9*(12), 1445.

Palgi, Y., Bergman, Y. S., Ben-David, B., & Bodner, E. (2021). No psychological vaccination: Vaccine hesitancy is associated with negative psychiatric outcomes among Israelis who received COVID-19 vaccination. *Journal of Affective Disorders*, *287*, 352-353.

Pan, K. Y., Kok, A. A., Penninx, B. W., & Giltay, E. J. (2022). Attitudes towards COVID-19 vaccination: A comparison between persons with different chronicity of pre-pandemic depressive, anxiety or obsessive-compulsive disorders. *Acta Psychiatrica Scandinavica*, *145*(4), 412-415.

Pappé, I. (2021). International Law and Settler Colonialism in Historical Palestine. *Omran For social sciences*, *10*(38), 155-171.

Parimi, K., Gilkeson, K., & Creamer, B. A. (2022). COVID-19 vaccine hesitancy: Considerations for reluctance and improving vaccine uptake. *Human Vaccines & Immunotherapeutics*, *18*(5), https://doi.org/10.1080/21645515.2022.2062972

Paul, E., Steptoe, A., & Fancourt, D. (2021). Attitudes towards vaccines and intention to vaccinate against COVID-19: Implications for public health communications. *The Lancet Regional Health-Europe*, *1*, 100012.

Peteet, J. (2016). The work of comparison: Israel/Palestine and apartheid. *Anthropological Quarterly, 88,* 247-281.

Radwan, E., Radwan, A., Radwan, W., & Pandey, D. (2021). Prevalence of depression, anxiety and stress during the COVID-19 pandemic: a cross-sectional study among Palestinian students (10–18 years). *BMC psychology*, *9*(1), 1-12.

Rehman, U., Shahnawaz, M. G., Khan, N. H., Kharshiing, K. D., Khursheed, M., Gupta, K., Kashyap, D., & Uniyal, R. (2021). Depression, anxiety and stress among Indians in times of COVID-19 lockdown. *Community mental health journal*, *57*, 42-48.

Rosenthal, F. S. (2021). A comparison of health indicators and social determinants of health between Israel and the Occupied Palestinian Territories. *Global Public Health*, *16*(3), 431-447.

Saban, M., Myers, V., Ben-Shetrit, S., & Wilf-Miron, R. (2021). Socioeconomic gradient in COVID-19 vaccination: evidence from Israel. *International Journal for Equity in Health*, *20*(1), 1-9.

Samman, M., & Saifi, Y. (2022). Reproduction of Palestinian Heterotopic Space: Encountering First Wave of COVID-19 in East Jerusalem. *Middle East Critique*, *31*(2), 181-197.

Shadeed, S., & Alawna, S. (2021). GIS-based COVID-19 vulnerability mapping in the West Bank, Palestine. *International Journal of Disaster Risk Reduction*, *64*, 102483. https://doi.org/10.1016/j.ijdrr.2021.102483

Shevlin, M., McBride, O., Murphy, J., Miller, J. G., Hartman, T. K., Levita, L., Mason, L., Martinez A. P., McKay, R., Stocks, T.V. A., Bennett, K. M., Hyland, P., Karatzias, T. & Bentall, R. P. (2020). Anxiety, depression, traumatic stress and COVID-19-related anxiety in the UK general population during the COVID-19 pandemic. *BJPsych open*, *6*(6), e125. https://doi.org/10.1192/bjo.2020.109

Shoib, S., Gupta, A., Saleem, S. M., Shellah, D., Javed, S., & Handuleh, J. I. (2021). Mental health in Palestine amid war and COVID-19 pandemics. *Asian Journal of Psychiatry*, *66*, 102909. https://doi.org/10.1016/j.ajp.2021.102909

Singh, B., & Chattu, V. K. (2021). Prioritizing 'equity'in COVID-19 vaccine distribution through Global Health Diplomacy. *Health Promotion Perspectives*, *11*(3), 281.

Shoib, S., Gupta, A., Saleem, S. M., Shellah, D., Javed, S., & Handuleh, J. I. (2021). Mental health in Palestine amid war and COVID-19 pandemics. *Asian Journal of Psychiatry*, *66*, 102909.

Smith, K., Lambe, S., Freeman, D., & Cipriani, A. (2021). COVID-19 vaccines, hesitancy and mental health. *Evidence-Based Mental Health*, *24*(2), 47-48.

Solís Arce, J. S., Warren, S. S., Meriggi, N. F., Scacco, A., McMurry, N., Voors, M., ... & Omer, S. B. (2021). COVID-19 vaccine acceptance and hesitancy in low-and middle-income countries. *Nature medicine*, *27*(8), 1385-1394.

Statistics Canada (2020). Mental Health of Canadians during the COVID-19 Pandemic. Document retrieved online on 29/06/2023 at https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2020039-eng.htm

Tatar, M., Shoorekchali, J. M., Faraji, M. R., & Wilson, F. A. (2021). International COVID-19 vaccine inequality amid the pandemic: Perpetuating a global crisis?. *Journal of global health*, *11*.

Tsutsumi, S., Maeda, N., Tashiro, T., Arima, S., Mizuta, R., Fukui, K., Naito K, Komiya, M., & Urabe, Y. (2022). Willingness to receive the COVID-19 vaccination and the psychological state of Japanese University Students: a Cross-Sectional Study. *International Journal of Environmental Research and Public Health*, *19*(3), 1654.

Turna, J., Zhang, J., Lamberti, N., Patterson, B., Simpson, W., Francisco, A. P., Bergmann, C.G., & Van Ameringen, M. (2021). Anxiety, depression and stress during the COVID-19 pandemic: Results from a cross-sectional survey. *Journal of Psychiatric Research*, *137*, 96-103.

Umakanthan, S., Patil, S., Subramaniam, N., & Sharma, R. (2021). COVID-19 vaccine hesitancy and resistance in India explored through a population-based longitudinal survey. *Vaccines*, *9*(10), 1064.

Unicef (2021). State of Palestine receives its third allocation of COVID-19 vaccines through the COVAX facility. Document retrieved by internet on June 2023 at https://www.unicef.org/sop/press-releases/state-palestine-receives-its-third-allocation-COVID-19-vaccines

Veronese, G., Cavazzoni, F., Fiore, F., & Rachel, P. (2021). Fear of COVID-19 mediates the relation between mental distress and at-risk health behaviours in Italian adults. *Mediterranean Journal of Clinical Psychology*, *9*(3), 9–36.

Veronese, G., Mahamid, F., Bdier, D., & Pancake, R. (2021). Stress of COVID-19 and mental health outcomes in Palestine: the mediating role of well-being and resilience. *Health Psychology Report*, *9*(4), 398-410.

Watt, G., Giacaman, R., Zurayk, H., Bjertness, E., Holmboe-Ottesen, G., Ghattas, H., Nuwayhid, I., Leaning, J., Yudkin, J., Elessi, K., Sullivan, R., Afifi, R., Khader, Y. S., & Shannon, H. S. (2021). COVID-19 vaccines for Palestinians. *The Lancet*, *397*(10274), 579.

World Health Organization. (1996). *WHOQOL-BREF: introduction, administration, scoring and generic version of the assessment: field trial version, December 1996* (No. WHOQOL-BREF). World Health Organization.

Zarocostas, J. (2021). Aid agencies escalate Gaza relief effort. *The Lancet*, *397*(10290), 2136.

Zhang, W. R., Wang, K., Yin, L., Zhao, W. F., Xue, Q., Peng, M., Min, B., Tian, Q., Leng, H., Du, J., Chang, H, Yang, Y., Li, W., Shangguan, F., Yan, T., Dong, H., Han, Y., Wang, Y., Cosci, F., & Wang, H. X. (2020). Mental health and psychosocial problems of medical health workers during the COVID-19 epidemic in China. *Psychotherapy and psychosomatics*, *89*(4), 242-250.

Zureik, E. T. (2023). *The Palestinians in Israel: A study in internal colonialism* (Vol. 38). Taylor & Francis.

Zureik, E. (2001). Being Palestinian in Israel. *Journal of Palestine Studies, 30*(3), 88-96.

Table 1. Descriptive statistics for the main study's variables (N= 1122)

Variable	Mean	S.D	Min	Max	Range	Skewness	Kurtosis	Reliability
QoL	3.41	.019	1.21	4.96	3.75	-.51	.32	.90
Stress	2.15	.019	1.00	4.00	3.00	.48	.05	.82
Anxiety	1.80	.020	1.00	4.00	3.00	1.04	.85	.85
Depression	2.12	.019	1.00	4.00	3.00	.52	.14	.86
Fear of COVID	1.66	.02	.29	5.00	4.71	1.48	1.54	.91
Reluctance	2.43	.01	.15	4.00	3.85	.13	.01	.86

Table 2. Pearson Correlation between Reluctance to the vaccine as an outcome and QOL, Stress, Anxiety, Depression and Fear of COVID as predictor variables (N= 1122).

		1	2	3	4	5	6
1	Reluctance to vaccine	1.000					
2	QOL	-.08**	1.000				
3	Stress	.28**	-.35**	1.000			
4	Anxiety	.27**	-.36**	.81**	1.000		
5	Depression	0.28**	-.37**	.89**	.83**	1.000	
6	Fear of COVID	.23**	-.16**	.37**	.45**	.37**	1.000

*** α is significant at ≤ .01*

Table3: Hierarchical regression analysis for variables predicting vaccination reluctance (N= 1122)

Variable	B	SEB	β	Sig.	R2
Step1					
Gender	.13	.03	.10	.000***	
Residence	.07	.02	.08	.004***	.03
Age	.03	.01	.07	.01**	
Educational level	.14	.02	.15	.000***	
Step2					
Gender	.11	.03	.08	.003***	
Residence	.05	.02	.05	.039***	
Age	.06	.01	.12	.000***	.13
Educational level	.11	.02	.12	.000***	
Stress	.07	.05	.08	.20	
Anxiety	.03	.04	.04	.45	
Depression	.14	.06	.15	.02*	
Fear of COVID	.07	.02	.11	.000***	
QoL	.05	.02	.06	.04*	

**** P < .001; *p < .05*

Table 4: Hierarchical regression for variables predicting vaccination reluctance due to geographical region (N= 1122)

Region	Variable	B	SEB	β	Sig.	R2
West Bank	*Step1*					
	Stress	-.11	.10	-.117	.27	
	Anxiety	.10	.08	.11	.22	.08
	Depression	.31	.10	.32	.004***	
	QOL	.08	.06	.08	.15	
	Step2					
	Stress	-.09	.10	-.10	.35	
	Anxiety	.05	.09	.05	.56	.09
	Depression	.31	.10	.32	.004***	
	QOL	.08	.06	.02	.14	
	Fear of COVID	.08	.044	.10	.06	
Gaza	*Step1*					
	Stress	.07	.08	.08	.41	
	Anxiety	.08	.06	.09	.23	.05
	Depression	.04	.08	.05	.59	
	QOL	-.06	.03	-.07	.12	
	Step2					
	Stress	.04	.08	.05	.60	
	Anxiety	.04	.06	.05	.50	
	Depression	.05	.08	.06	.51	.09
	QOL	-.05	.03	-.07	.13	
	Fear of COVID	.08	.02	.14	.002***	
East Jerusalem	*Step1*					
	Stress	.88	.30	.90	.005***	
	Anxiety	.05	.26	.04	.84	.24
	Depression	-.47	.30	-.49	.12	
	QOL	.05	.15	.05	.73	
	Step2					
	Stress	.92	.31	.94	.004***	
	Anxiety	.06	.26	.05	.80	
	Depression	-.52	.31	-.54	.10	.25
	QOL	.04	.15	.04	.79	
	Fear of COVID	-.07	.11	-.08	.53	
Israel	*Step1*					
	Stress	.38	.17	.50	.02*	
	Anxiety	-.07	.12	-.10	.53	.45
	Depression	.04	.17	.05	.79	
	QOL	.35	.09	.32	.000***	
	Step2					
	Stress	.35	.16	.46	.03*	
	Anxiety	-.17	.12	-.23	.16	.51
	Depression	.06	.16	.08	.67	
	QOL	.36	.09	.32	.000***	
	Fear of COVID	.14	.04	.27	.001***	

*** P < .01; *p < .05*

Dear Prof. Neil Quinn,

Thank you for letting us revise the article,

Here below you will find our answers to the reviewers into details,

Reviewer: 1

Recommendation: Major Revision

Comments:
Dear author(s), thank you for the pleasure of reviewing a significant manuscript. In general, I am positive of the prospect of this manuscript. If the identified concerns have been addressed, I am sure that this manuscript will be a valuable addition to the vast literature of COVID-19. The Introduction requires consolidation, as I am aware that you did not represent most publications that covered similar topic. This will eventually affect the quality of your discussion. Therefore, whenever I see an Introduction which is lacking, I tend to be skeptical of the points stated in the Discussion section. Therefore, please conduct a thorough literature search before revising the manuscript. Given the large sample size, I suggest analyzing the data set with SEM. The way you present the results (especially Table 4) is confusing. Please take this opportunity to revisit the analysis as well.

A: we extensively revised the paper in accordance with the reviewer's queries, justifying why we still preferred linear regression to SEM while accomplishing to all other queries. The main aim of our paper is to test the role of some selected variables (QoL, fear of COVID, depression, anxiety and stress) and region as well in predicting vaccination reluctance, and not to test the role of moderating variables in vaccination reluctance. We modified table 4.

Additional Questions:
1. Originality: Does the paper contain new and significant information adequate to justify publication?: Depression, anxiety and stress in the context of COVID-19 have been covered previously. Therefore, I am uncertain of this manuscript contain new and significant information. Additionally, the scope covered hardly convey anything new.

A1: the most clear novelty of our paper is the context, and the tested population. In fact, Palestine is characterized by an ongoing Mental Health Crisis with a strong deterioration of QoL that could have affected vaccinal choices.

It is important for the author(s) to clearly convey the originality and importance of this manuscript. Currently, these aspects are vaguely present in the manuscript.

A1: We tried to highlight it better in the Study Section.

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Depression, anxiety and stress in the context of COVID-19 have been covered previously. This manuscript hardly represent this aspect in its introduction. It is imperative for the author(s) to conduct a thorough literature search for relevant articles.

A2.: we extensively revised the literature

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: No evident issue with Methodology. I am aware that the data set was analyzed using stepwise multiple regression. My question is, why must it be a stepwise multiple regression? Why can't it be a hierarchical regression? I suggest replacing the analysis with SEM. The sample size is adequate for any analysis. In this light, SEM, which is a statistical method with greater flexibility than regression, will provide more perspectives.

A3: we preferred hierarchical regression to SEM and explained the reasons in the limitation session.

It is imperative to outline protocol for data cleaning. In particular, please cover the basic assumptions, such as normality and the presence of outliers (both univariate and multivariate).

A3: we added in data analysis assumptions of normality

4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: No. This manuscript concluded that mental health (depression, anxiety and stress) and fear of COVID-19 increases vaccine hesitancy. However, the author(s) reported that the significance of these aspects differed; that not all mental health aspects significantly predicted vaccine hesitancy.

A4: we expanded the discussion and underlined the role of different aspects of mental health in predicting hesitancy.

5. Practicality and/or Research implications: Does the paper identify clearly any implications for practice and/or further research? Are these implications consistent with the findings and conclusions of the paper?: No. As mentioned in the comments for Results, there is a discrepancy between the conclusion and the generated findings. For this, I am skeptical of the proposed implications. These aspects require further consideration from the author(s).

A5: we consistently reworked our results section.

6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: No evident issue.

Reviewer: 2

Recommendation: Minor Revision

Comments:
If possible you could try and comment on the relevance of the findings to other places around the world, although I am aware that in terms of duration it is hard to find any comparable occupation.

A2,1: we discussed the relevance at the very end of the paper

Additional Questions:
1. Originality: Does the paper contain new and significant information adequate to justify publication?: It is definitely original, to compare factors affecting take-up of COVID vaccination in occupied territories, and a comparable population.

2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: There is a good selection of relevant references. However knowledge is assumed of the political/ human geography situation of Israel; so it would help to link to an explanation of the key factors. Also the terminology such as 1948 territories can be confusing - perhaps that term is familiar to Palestinians, but not others.

A2,2: we added literature

3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: There is one flaw in the methodology which stood out: an exclusion criterion was "free of any mental and neurodevelopmental conditions" which, for one thing, would have excluded a large proportion of the population (particularly in the Occupied Territories where there is a higher rate of mental illness); and secondly, the results are anomalous, where a high score was found on DASS

A2,3: we apologize for the inaccuracy and corrected the sentence.

I am also slightly confused about the reason for:
"The instruments were translated from the original English version to Arabic and then back to Arabic."
I wondered why "We hypothesized an effect of mental health, QoL, and fear of Covid-19 on vaccine hesitancy (H1)"

A2,3: we apologize for the inaccuracy and corrected the sentence.

4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: The problem mentioned in the previous answer casts a shadow over the results; but there may be a good explanation.
When giving figures for educational level, it would be useful to have some comparison figures for Palestinians in the same territories; it may show that the sample is not a good representation of the population.

A2,4: we reworked our discussion in the light of demographics

I think rather than describing results of DASS as depression and/or anxiety, it would be preferable to use terms such "with symptoms of ..." or "with a high/moderate depression score" because the scale doesn't provide a diagnosis.

A2,4: we corrected preferring the use of symptoms rather than the diagnostic label.

In Table 1, some figures are given to 4 decimal places, which to me is inappropriate, because the measures are not that accurate. Same for Tables 3 & 4, which even have 5 decimal places.

Table 4 is not easy to follow;because of the superscripts; perhaps these results could be put into separate tables, for each region?

A2,4: we reworked tables accordingly.

5. Practicality and/or Research implications: Does the paper identify clearly any implications for practice and/or further research? Are these implications consistent with the findings and conclusions of the paper?: There is not enough discussion of the practical implications of the fact that Israel controlled supplies of vaccines, and related to that, how some Palestinians might not trust the source of supply. Also there could be more discussion of whether the questionnaires discriminate direct effects of living in Occupied Territories, from general levels of anxiety / depression in the population.
There could be some discussion of why QoL did not appear as a factor in vaccine hesitancy in the Occupied Territories; perhaps if low QoL is "endemic" there, the effect would be hidden?

A2,5: we expanded the conclusions

6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: The paper is well structured but it would help is someone with more proficient use of English could check through the text.
This sentence lacks the key phrase "Cronbach's alpha" "The reliability of all scales used was high, with all scales being > 0.8, the lowest being Stress (0.82) and the highest being FCV-19S (.91)."

A2,6: we reworked for editing

Associate Editor
Comments to the Author:
We require a structured abstract - please refer to the attached guide.

AnswerE1: we followed the instruction

DASS does not conclusively test for anxiety or depression. Where I have put 'scores/score' an alternative would be symptoms.

AnswerE2: we rectified our misuse of diagnosis labels throughout the text

It is important to give an explanation of the socio-political situation - you cannot assume the reader has heard of it. Was the vaccine offered free of charge?

AnswerE3: we gave a glimpse of the socio-political context in 'the study section
For COVID and vaccines, more widely:
https://www.mdpi.com/2076-393X/9/12/1445
And in one country:
https://www.emerald.com/insight/content/doi/10.1108/JPMH-06-2021-0076/full/html

AnswerE4: we added such a literature and extended the discussion on it