

3 years after the Covid-19 pandemic: the perception of healthcare workers towards Covid-19 booster vaccine in Malta

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Introduction

As Covid-19 virus continues to mutate and form new variants, booster vaccines still play a role in striving for herd immunity. This study aims to analyse the Covid-19 booster vaccine acceptance rate amongst the health care workers working in the surgical department in Malta. This study also explored reasons why healthcare workers did not take the Covid-19 booster vaccine.

Method

A cross-sectional study using an online anonymous survey was done between 25th November 2023 and 28th December 2023.

Results

A total of 121 health care workers responded to the online questionnaire. From the 121 respondents 53.7% were female and 46.3% males. Participants were split between doctors (61.9%) and nurses (38.1%) of different grades. 99.2% of respondents were already inoculated against the Covid-19 virus. This study revealed a rate of booster vaccine acceptance of 20.8%. The major reasons for declining the booster vaccine were side-effects and concern about vaccine safety. Age was noted to be the biggest variable with only 10% of 20-30 taking the booster vaccine compared to 43.8% of 51-60-year-olds. Previous Covid-19 infection, being hospitalised or having a relative hospitalised due to Covid-19 infection were not motivating factors to increase booster vaccine uptake.

Conclusion

Overall there is relatively low booster acceptance among health care workers mainly due to concerns about vaccine safety, vaccine efficacy, and lack of trust. Introducing targeted education, risk communication and certain policies may help improve the perception towards Covid-19 booster doses which in turn may increase acceptance rate.

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Covid-19 is a viral infectious disease that is caused by the SARS-CoV-2 Virus. This virus typically causes mild to moderate respiratory symptoms and most people who are affected by this illness will recover with only symptomatic relief as treatment. In some cases patients develop severe symptoms and require medical attention. Patients with comorbidities have a higher risk of developing severe symptoms, however incidence of Covid-19 and Covid-19 related mortality have not been associated with any age group in the literature.¹

Actions such as good hand hygiene, wearing facemasks and social distancing have been shown to be effective ways to reduce the risk of infection with Covid-19. A widespread vaccination programme with the aim of achieving herd immunity is considered a more suitable long-term solution to reduce overall morbidity and mortality. Despite this, people in the community and some health care workers remain sceptical about the efficacy and safety of the developed vaccine and subsequent boosters. These doubts about the vaccine were increased due to documented side effects ranging from mild complications to death.^{2,3}

A prospective study by Menni et al showed that vaccine effectiveness after 5 months remained high among people under 55 years. It also showed that booster doses restore vaccine effectiveness.⁴ The rate of confirmed infection was noted to be approximately 10 times lower in the booster group when compared to the non booster group.⁵

Health care workers especially those with direct contact with patients and their household members have an increased risk of hospitalisation when infected Covid-19. Health care workers have a very important role in vaccination campaigns, not only on their and household members' health, but the attitude of health care workers also directly impacts the attitude of the generalised public towards vaccination.⁶

Multiple efforts by concerned authorities were done to show that Covid-19 vaccination and boosters were safe and essential to help keep herd immunity and protect the public from Covid-19 infection. Despite this, there was still hesitancy amongst members of the general public and in health care workers.^{7,8}

This study aims to analyse the acceptance rate of Covid-19 booster vaccine by nurses and doctors in the

Surgical department in Mater Dei Hospital, which is the main public hospital in Malta. This study also aims to describe the concerns that healthcare workers might have against taking the booster vaccine.

MATERIAL AND METHODS

A cross sectional study was carried out amongst the nurses and doctors in the surgical department in Mater Dei Hospital - the main acute hospital in Malta. Data was collected via an online anonymous questionnaire between 25th November 2023 and 28th December 2023. No ethical approval was required for completion of this study. The questionnaire was distributed via email and also promoted with posters placed in general staff areas. The questionnaire was sent to 274 nurses and 228 doctors with a total of 502 health care workers. There were a total of 121 responses (24.1% response rate).

The Questionnaire consisted of 10 questions (taking approximately 1 minute to complete) with the aim to keep the questionnaire easy and simple to encourage participation. The questionnaire was split into three sections. Section one included demographic information; age, gender and role. Section two included whether the participants had taken the first doses of the Covid-19 vaccinations and their motivation to accept or refuse. In this section participants were also asked whether they had ever contracted the virus and whether they or anyone close to them had required hospitalisation due to Covid-19 infection so as to determine if this can result in a different perception towards the importance of Covid-19 booster. In Section 3 the participants were asked if they had taken the Covid-19 booster in 2023 and the reason for taking it or refusing it. The questionnaire was distributed via Google Forms and data was compiled using Microsoft Excel.

RESULTS

The demographics of the participants were as shown in [Figure 1](#) and [Figure 2](#). 53.7% of respondents were female and 46.3% males. Most participants (38%) were between the ages of 20-30. 28.1% were aged between 31-40, 14.9% were between the ages 41-50. Participants between the ages of 51 and 60 made up 13.2% of the total and 5.8% of participants were over 60 years of age.

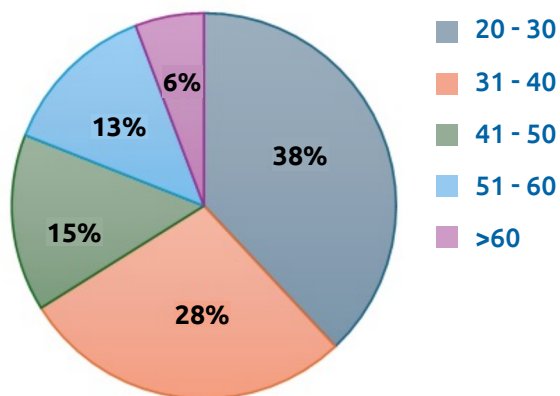


Figure 1 Age groups of participants

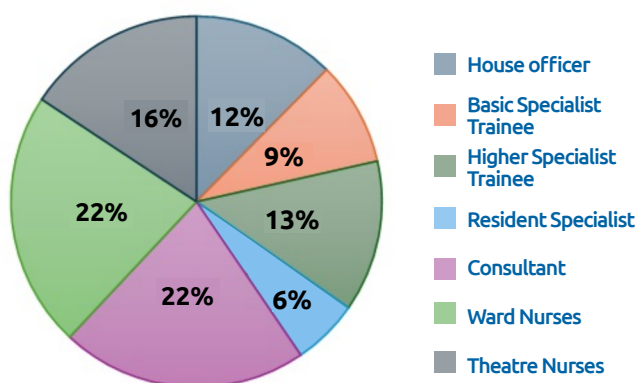


Figure 2 Roles of participants

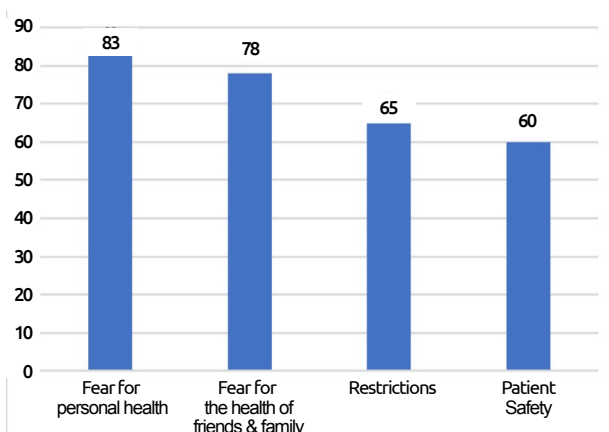


Figure 3 Reasons for taking Covid-19 Vaccine

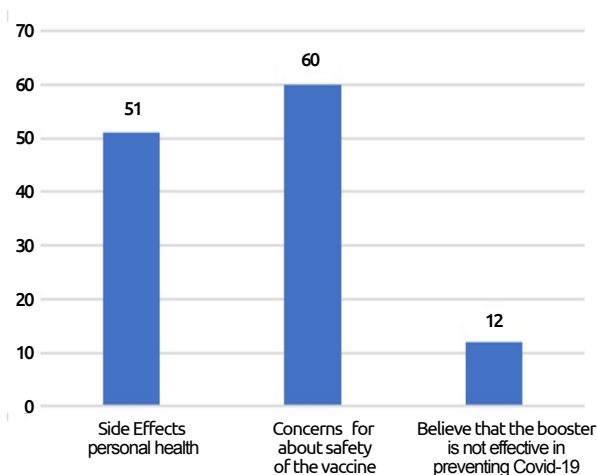


Figure 4 Reasons for refusing Covid-19 booster

Participants were split between 61.9% doctors of different grades and 38.1% nurses including both ward and theatre nurses.

Out of 121 participants 120 or 99.2% reported that they had taken the first Covid 19 vaccines. Participants were also asked to list their motivations for taking the initial Covid-19 vaccination, with each participant able to name more than one reason for taking the vaccine. The main reasons mentioned were fear of possible effects of Covid-19 infection on personal health with 83 votes (68.6%) and fear of possible effects of Covid-19 infection on family and friends with 78 votes (64.5%). Other motivations were the restrictions imposed on unvaccinated people with 65 votes (53.7%) and patient safety with 60 votes (49.6%) (**Figure 3**).

Out of the participants 95 respondents (79.2%) did not take the booster vaccine while only 25 respondents (20.8%) took the booster vaccine in 2023. The reasons named for refusing the booster vaccine are shown in **Figure 4** below. Participants could choose more than one reason for refusing the vaccine.

It was noted that having contracted Covid-19 infection did not affect the motivation to get the Covid-19 booster vaccine. 21% of those who had been infected took the booster which is identical to the overall booster vaccination rate. Having been hospitalised or having a family member/close friend hospitalised also did not increase the rate of booster vaccination with only 15.3% of this population taking the booster in 2023.

The percentage of doctors and nurses taking the booster in 2023 was also comparable with no significant difference, 20% of nurses and 22% of doctors who answered the questionnaire were vaccinated with the booster.

The major difference in rate of booster vaccination was noted in the different age groups. The rate of vaccination in different ages is shown in the **Figure 5**.

DISCUSSION

On December 12th 2019 in Wuhan China, a group of patients were noticed to be experiencing symptoms of an atypical pneumonia-like illness which was not responding to the standard treatment. This was later

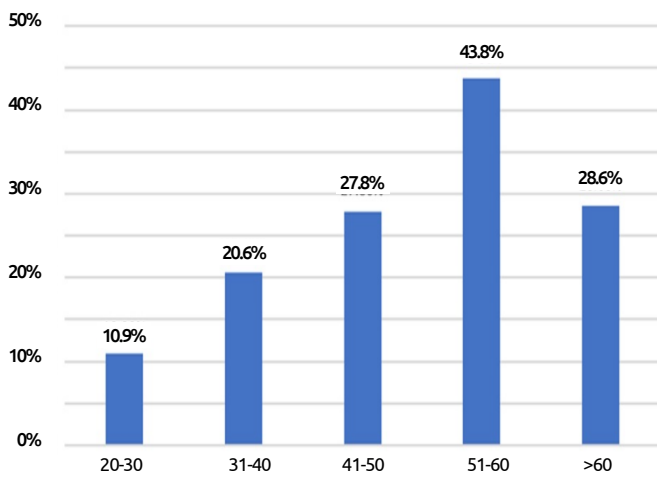


Figure 5 Percentage of booster uptake according to age groups

identified to be the result of a novel coronavirus on 7th January 2020.

The first case of Covid-19 in Malta however did not appear until 7th March 2020 when a 12-year-old girl and her parents tested positive to Covid-19 after they returned to Malta from their holiday in Italy.⁹ The first death as a result of Covid-19 was reported on 8th April 2020 - a 92-year-old woman from the island of Gozo.¹⁰

The first measures taken by the Maltese government were enforced on the 24th of February 2020 where anyone entering Malta had to be screened by thermal scanners and all patients with respiratory symptoms were tested for Covid-19. In addition to this, people returning from Italy had to quarantine for 14 days in view of the high number of cases present in Italy during that time.^{11,12} Mandatory quarantine was extended to people returning from any country on March 11th and all sea or air travel was prohibited.¹³

In March 2020, the Government of Malta gradually announced a set of regulations with the aim to decrease the spread of the Covid-19 virus:

- Closure of all schools, university and childcare centres
- Closure of day centres for the elderly
- Stop religious activities unless absolutely necessary
- All football games to be played behind closed doors. Other matches were postponed
- No political activities.
- Closure of all gyms, bars and restaurants
- Closure of non-essential retail and service
- Banning of all organised group gatherings
- Schools and educational institutions closed until the end of the scholastic year and online teaching was used for continuity.^{14,15}

Rules and regulations were changed in accordance to the number of active cases with regulations being relaxed when the number of cases started to drop and again made stricter as the number of cases increased.

The first doses of the Covid-19 vaccine were given in January 2021, initially to health care workers and elderly over the age of 85 and slowly the criteria were extended until May 2021. Malta became the first country in the European Union to offer vaccination to the entire population (16). The first two vaccines that were being given to the Maltese public were the Pfizer and Astrazeneca vaccines.¹⁷ On 25th May 2021 it was announced that 70% of the Maltese population had been fully vaccinated thus reaching the minimum estimated benchmark for herd-immunity.¹⁸

During the Covid-19 pandemic the Maltese government prioritised health care worker safety, making sure that all healthcare workers were properly supplied with the PPE required by the guidelines during that period. This along with other protective measures made sure that Malta suffered zero deaths of health care workers from Covid-19 infection.

Figure 6 shows the death rates per 100,000 population secondary to Covid-19 infection in EU countries. As evidenced in the graph, Malta had the

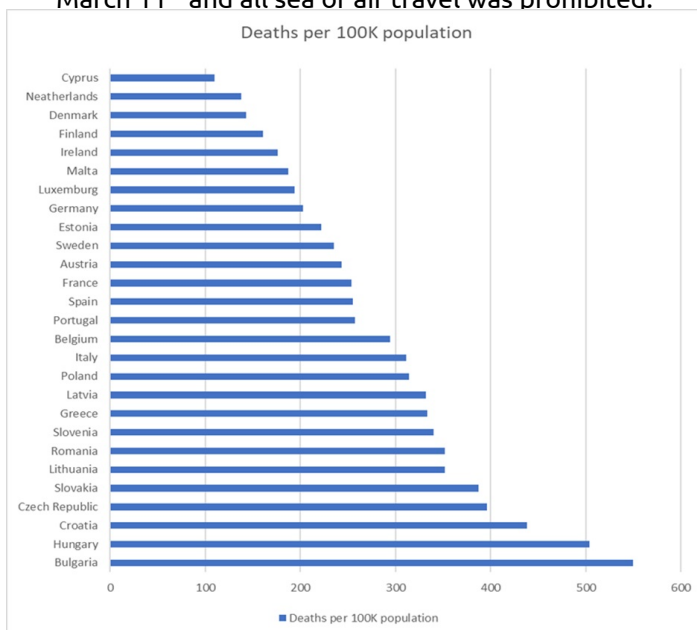


Figure 6 Deaths secondary to covid-19 infection per 100K in EU countries.²²

6th least amount of deaths per 100 thousand population.¹⁹

As with any medication Covid-19 vaccines and subsequent booster doses have associated side effects. Covid-19 booster side effects include: ^{20,21}

- a sore arm from the injection
- fatigue
- coryzal symptoms
- fever/chills
- nausea/vomiting
- pruritus
- myocarditis
- pericarditis
- lymphadenitis (neck, axilla)
- Anaphylaxis
- 30% increased risk of thrombocytopenia.

The attitude of healthcare workers towards Covid-19 booster is important for multiple reasons. Health care workers are at high risk of infection due to their proximity with multiple patients in the hospital environment. Apart from this the attitude of health care workers greatly influences the perception of the general public towards the booster vaccine.

Similar studies were performed in other countries to assess the acceptance rate of the booster vaccine. In the US, specifically in the states of Arizona, Minnesota, Florida and Wisconsin it was noted in a study published in 2023 by Farah et al that 64.8% of health care workers had received the Covid-19 booster vaccine. (22) In Singapore a similar study published in 2022 reported that 73.8% of eligible health care workers received the booster vaccine.²³ Similar studies were also done in Italy. In 2022 a study was conducted in 4 public hospitals in southern Italy where it was noted that 48.1% of eligible health care workers received the Covid-19 booster dose.²⁴ Another study in Italy, published in 2023 noted that acceptance rate of the Covid-19 booster vaccine was at 13%.²⁵

As clearly evidenced by the above data, Covid-19 booster acceptance rate varies greatly, between countries and over different time periods. As time passes people including health care workers are

becoming less concerned about Covid-19 infection and therefore less likely to take the booster dose. In our study it was noted that 20.8% of health care workers interviewed had taken the booster. When compared to studies published in 2023 healthcare workers in our study have an increased booster vaccination rate when compared to Italy, however when compared to that of the US it is noted to be significantly lower.²⁴⁻²⁵

Vaccine uptake rate and motivation for taking or refusing a vaccine is dependent on a multitude of factors. Thomson et al developed the 5 A's model to help facilitate the understanding of the sociocultural, structural, organisational and individual factors influencing the rates of vaccine uptake (Table 1).²⁶ In Malta's case the vaccine was easily accessible and affordable as booster vaccines were being offered for free in vaccination stations set up in prominent places in the hospital. Our study set out to determine the awareness and acceptance and activation of the Covid-19 booster vaccine. The low acceptance rate also reflects the low awareness regarding the need for taking the booster vaccine. It also shows that healthcare workers require increased activation to increase booster vaccine uptake.

Table 1 The 5 A's (Source: Thomson, Robinson and Vallée-Tourangeau, 2016)²⁶

The 5 A's	Description
Access	The ability of individuals to be reached by, or to reach, recommended vaccines
Affordability	The ability of individuals to afford vaccination, in terms of both financial and nonfinancial costs
Awareness	The degree to which individuals have knowledge of the need for, and availability of, recommended vaccines and their objective benefits and risks
Acceptance	The degree to which individuals accept, question, or refuse vaccination
Activation	The degree to which individuals are nudged toward vaccination uptake

The major reason for refusing the vaccine was concern about the vaccine safety with 50% of participants naming this as their motivation for refusing vaccination. This could be the result of lack of information about the vaccine offered to both the health care professionals and the general public.

This decreased level of vaccination was seen in all ages and roles; however it was even more relevant in the young population with only 10% of 20-30 year olds having been vaccinated. Hence if one is to target a specific population to educate and try to increase the rate of booster vaccination, education should be tailored to the younger age group.

CONCLUSION

This survey provides an outlook on how healthcare workers view COVID-19 vaccine booster and what causes the hesitancy and the potential variables influencing their decision of getting vaccinated. The low response rate of only 24.1% is the major limitation in this study.

The relatively low booster vaccine acceptance among healthcare workers could result from concerns about vaccine safety, vaccine efficacy, and lack of trust. In addition, the experience of reduced incidence and

SUMMARY BOX

- As Covid-19 virus continues to mutate and form new variants, booster vaccines still play a role in striving for herd immunity.
- Overall there is relatively low booster acceptance among health care workers mainly due to concerns about vaccine safety, vaccine efficacy, and lack of trust.
- Introducing targeted education, risk communication and certain policies may help improve the perception towards Covid-19 booster doses which in turn may increase acceptance rate.

limited effects of Covid-19 infection in most cases has reduced interest in the benefit of the vaccine when compared to the risk of side effects. The presented observations and conclusions may serve as tools for building future policies and public health actions designed to increase the COVID-19 vaccination rate. As part of these efforts the results of this study will be presented in a poster and circulated in order to increase awareness and promote future vaccination uptake.

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