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Perception, Barriers and Acceptance of COVID 19 Vaccination in Surgical Patients: A Single Centre Study

Akaninyene Dan [a], Christopher Odah [b], Charannya Balakumar [a], Temitope Omokehinde [a], Charlotte Burford [a] , Chijioke Ikechi [a], Ankur Shah [a]

[a] Department of General Surgery, East Kent Hospital University NHS Foundation Trust, Ashford, UK.
[b] Maidstone and Tunbridge Wells NHS Trust, UK.

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Correspondence: Akaninyene Dan, a Department of General Surgery, East Kent Hospital University NHS Foundation Trust, Ashford , UK.
Email: akaninyene.dan@nhs.net

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The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors. Indeed, all the authors have actively participated in the redaction, the revision of the manuscript, and provided approval for this final revised version.

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Conflict of interest
The authors declare that there is no conflict of interest regarding the publication of this article.

ABSTRACT

Background: The COVID-19 vaccination programme has been one of the most important measures to reduce spread and severity of COVID-19 infection. However, acceptance of the vaccine has met with challenges due to the speed of its development and concerns about side-effects. The aim of this study was to assess knowledge of the vaccination as well as barriers to acceptance and the overall impact of the vaccination on personal protective behaviors of surgical patients.

Method: In this cross-sectional study, a self-completed questionnaire was given to inpatients on all general surgery wards at a district general hospital between April and May 2021. Participation was voluntary. The questionnaire was designed to assess participant knowledge of and adherence to the COVID-19 vaccination programme as well as to understand participants views on other protective measures to prevent and reduce COVID-19 infection. Approximately 200-300 patients are admitted to our department monthly.

Results: A total of 202 respondents participated in the study, males comprised 29.2% of the individuals surveyed. The majority of the patients were over 40 years old (68.3%). All the participants were aware of the vaccine, and the government sensitization material was the most common source of information (37.9%).

The majority of individuals surveyed (79.7%) had received at least one dose of the vaccine. In the unvaccinated patients, 33 participants reported not being offered the vaccine while 4 patients stated that they do not believe in the vaccine.

Conclusion: The study demonstrated that the majority of the patients surveyed were quite familiar with the vaccines and were willing to participate in the vaccination program. However, the knowledge of the vaccine and its adverse effects would best be described as inadequate. Also, participants were largely aware of the measures put in place to curb the spread of the virus and did show a good level of compliance guidance.

Keywords: Perception, Vaccine, COVID 19, Adherence, Acceptance

INTRODUCTION

The COVID-19 pandemic has disrupted the global economy, health systems, and individuals' lives unlike anything seen in recent times. The total confirmed cases globally at the time of writing was 242,348,657, with 4,927,723 deaths recorded (1). Here in the UK, the number of confirmed cases at writing is 8,773,674, with 139,146 recorded deaths (2).

Across the world, the strain has been felt on even the most established and well-funded health care systems. Governments had to take decisive action to reduce this unprecedented demand. Health and safety restrictions were put in place to limit the spread of the virus with personal restrictions including lockdowns, social distancing measures, limits on public gatherings, and mandatory quarantines (3). At the time of writing, many of these measures have been eased in the UK due to the efficacy of the COVID-19 vaccination program; however, this remains under constant review.

The race to develop a COVID-19 vaccination was a key global initiative in the prevention of infection and to safely re-open society. This accelerated the research and development of vaccines and the introduction of mass vaccination programs. As we collected data for this study in April 2021, over 6.6 billion doses had been administered worldwide, with 47.6% of the world's population has received at least a single dose and over 19.3 million doses being administered daily (4).

However, as the vaccine rolled out worldwide, concerns started to arise about the safety of the vaccines, including evidence of an increased risk of clotting disorders (5). Indeed, a study by Coustasse et al. reported that the major threat to rolling back the pandemic was hesitancy regarding the vaccine (6). Healthcare professionals also share some of these concerns with public debates ongoing in the community. The concerns from healthcare professionals may also fuel vaccine rejection in the public's mind, and some studies have shown that vaccine refusal within the profession may contribute to this (7-9).

Other factors that can influence decisions to accept vaccination include cultural and religious norms, previous experience with vaccination, public understanding of the principles of drug trials, and knowledge about the efficacy of the various vaccines and the immune response produced (10). In addition, exposure to misinformation via unregulated social media platforms will influence individual decisions regarding the vaccine.

Healthcare workers were given priority in the vaccination roll-out as healthcare environments present a major source of potential infection spread among an already vulnerable population. Whilst vaccination levels among healthcare workers in the UK are high, with 85% of health workers had received at least one dose of the vaccine and 39% had received two doses (10), adherence to protective measures and vaccination advice may not be as robust amongst inpatients, who have the potential to cross infect one another.

This study aimed to ascertain the level of awareness of the vaccination and compliance with the vaccination program and various other public safety guidelines amongst a surgical inpatient population. This is important because not only will it support us in our stratification of risk to inpatients whilst trying to deliver care under unprecedented demand, but also help inform how we, as surgical practitioners, can support public health initiatives to encourage vaccination and adherence to health and safety measures.

METHODS

Study setting

The location of the study was the General Surgical Department of William Harvey Hospital, Ashford, Kent. The patients were sampled from all surgical inpatient and day-case wards and included emergency and elective cases. Pediatric surgical wards were excluded from this study as the vaccine was not available to those under 18 years of age at the time of the study.

Study design and sampling

A cross-sectional study design was used. A questionnaire was designed to assess the knowledge of the COVID-19 vaccines, patient adherence to guidelines on personal protection, beliefs about COVID-19, sources of information about the vaccines, and opinions on the efficacy of protective measures. The authors designed the questionnaire from current literature and public health guidelines. It also captured demographic data using a confidence level of 95% with a margin of error of 5%. A sample size between 132 – 169 patients is required to accurately represent the views of our surgical patient population as a whole.

Participants were asked which vaccine they had received. In the United Kingdom, the Pfizer-BioNTech vaccine, Oxford Astrazeneca vaccine, or Moderna vaccines were offered. From here on, ‘the vaccine’ or ‘the COVID-19 vaccine’ refers to either the Pfizer-BioNTech vaccine, Oxford Astrazeneca vaccine, or Moderna vaccine.

Ethical approval was granted under the East Kent University Hospitals NHS Foundation Trust ‘Grey Area Project’ regulations (Reference Number: 2021/GAP/20).

Data collection

The questionnaire was paper-based and self-administered to all inpatient and day-case surgical wards between April- May 2021. All patients on these wards were invited to participate in the study, but participation was completely voluntary. The questionnaires were given by the nurse or doctors following their treatment. Responses were collected anonymously. All patients that were too sick to respond or didn’t have the capacity were excluded from this study.

Data analysis

The data collected were analyzed using SPSS 27.0 Software IBM.

RESULTS

Socio-demographics

A total of 202 participants completed the questionnaire. 29.2% of the respondents were male. The majority of individuals surveyed were over 40 years of age (138 participants, 68.3%). There were 11 patients (5.4%) between 18 - 20 years, 31 (15.3%) between 21- 30 years of age, and 22 (10.9%) between 31-40 years.

Awareness of the vaccine

All 202 (100%) patients were aware of the COVID-19 vaccination.

Patients were allowed to list multiple sources of information from which they had learned about the COVID-19 vaccine. The most common method was government sensitization material (37.9%; Figure 1). Scientific fora (17.3%), word of mouth (16.5%), and social media (16.9%) were also important avenues by which patients learned of the vaccine. 8.9% of patients listed 'Other' as the source of their information but did not specify. 18.3% of patients listed more than one method they had heard about the vaccine.

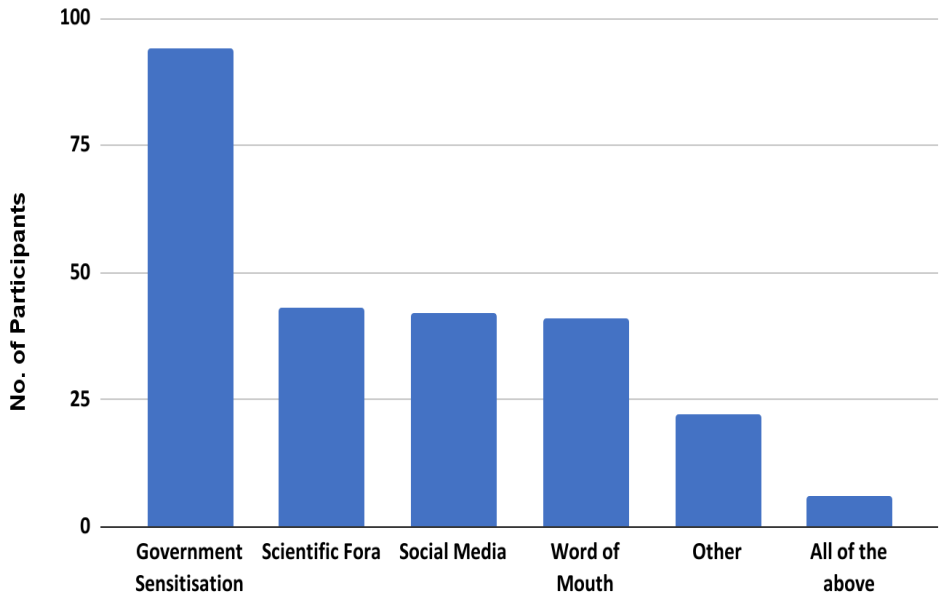


Figure 1: Bar chart demonstrating the number of participants who heard about the COVID-19 vaccination using the sources of information listed.

Vaccine compliance

One hundred sixty-one patients reported having had at least one dose of the COVID-19 vaccine (79.7%), while 81 patients had received two doses (40.1%). The median time between doses was ten weeks with an interquartile range of 8-12 weeks.

Of the 41 unvaccinated patients surveyed, 39 gave reasons for not having the vaccination (Figure 2). Thirty-three participants (80.5%) said they had not been offered the vaccination yet. Of these, 20 were under 40 years of age. 2 patients said they had difficulty accessing the vaccine, but further information was not given. Four remained unvaccinated as they did not believe in the vaccine.

58.5% of unvaccinated patients were female. There was no significant difference between the rates of vaccine adherence in males (73.0%) compared to females (82.7%, $p = 0.112$).

Of the vaccinated patients, 68 (42.2%) received the Pfizer-BioNTech vaccine, 88 (54.7%) the Oxford AstraZeneca vaccine, and 5 (3.1%) were unsure which vaccine they had received. While 27.9% of patients who had the Pfizer-BioNTech vaccine reported experiencing an 'adverse effect' compared to 46.6% of those who received the Oxford AstraZeneca vaccine, the 'adverse effects' rate was significantly higher in the Oxford AstraZeneca group ($p = 0.0198$). Patients were allowed to report multiple adverse effects. The three most common 'adverse effects' were headache ($n = 16$), chills ($n = 13$) and fever ($n = 12$). In this cohort, only one patient-reported symptom, which was consistent with an allergic reaction (facial swelling, itching, and temperature).

Knowledge of the vaccine

The Pfizer-BioNTech and Moderna vaccines are mRNA vaccines, while the Oxford Astrazeneca vaccine is a viral vector vaccine.

Of the 68 patients who had the Pfizer-BioNTech vaccine, 21 (30.9%) correctly identified it as an RNA vaccine. 57.4% of patients (n = 39) were unsure about the vaccine type. 8 patients wrongly identified the type as either conventional inactivated (n = 3), viral vector (n = 3) or protein subunit (n = 2).

Of the 88 patients who had the Oxford AstraZeneca vaccine, 77 (87.5%) were unsure about the type of vaccine. Only one patient correctly identified it as a viral vector vaccine. 10 patients wrongly identified the type as either conventional inactivated (n = 4) or an RNA vaccine (n = 6).

The majority of patients (72.3%) correctly identified that the vaccine offered between 51-100% protection. 24.3% of patients were unsure of the level of protection, while seven patients (3.5%) thought it only offered 1-50% protection.

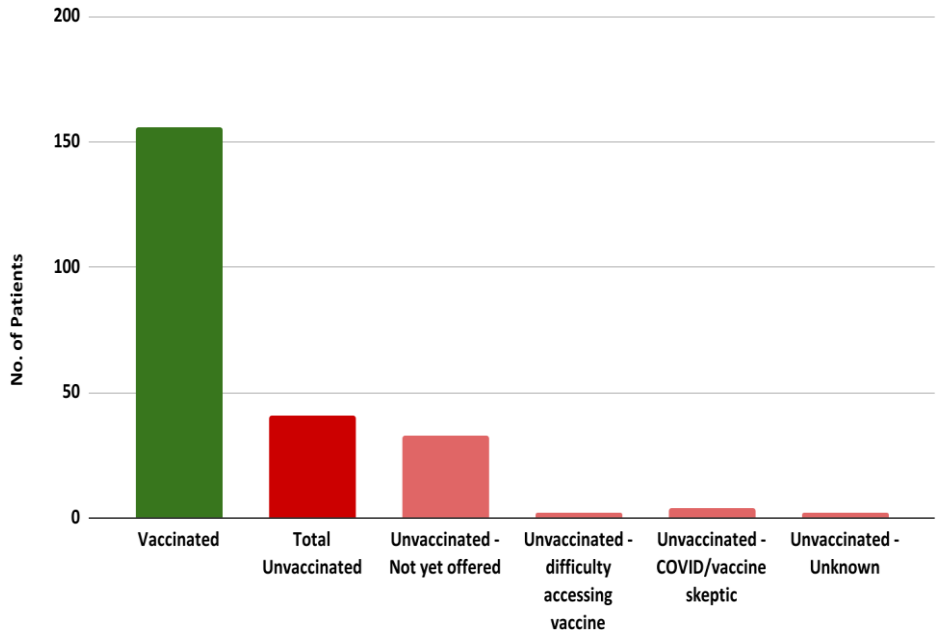


Figure 2: Bar chart showing the number of patients who are vaccinated compared to the number of patients who are unvaccinated and the reasons for non-compliance with the vaccination programme.

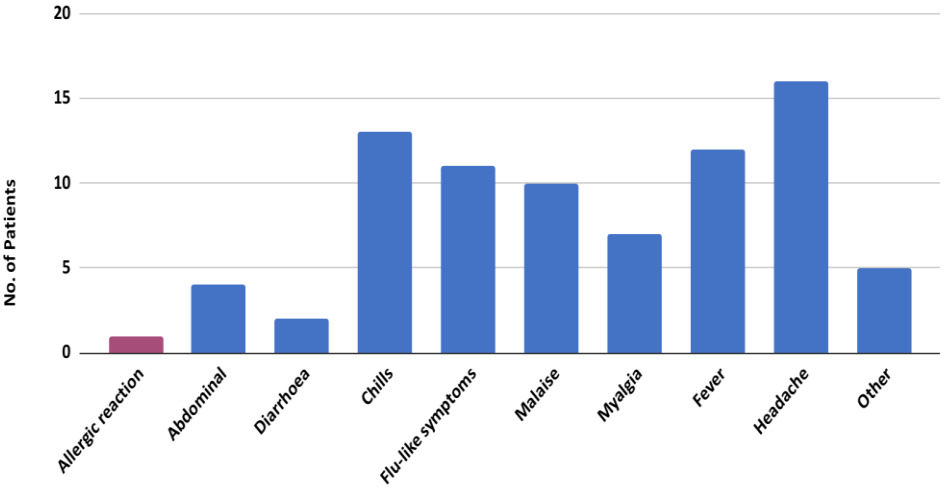


Figure 3: Bar chart showing the number of different 'adverse effects' reported by patients following COVID-19 vaccination.

Awareness of and adherence to personal health and safety measures

95.5% of patients said they were aware of personal protective measures against COVID-19. Of the 193 patients aware of personal protective measures, only two patients reported that they were not practicing the protocols, and only three felt the measures were not helpful.

The largest source of information for patients regarding personal protective measures was government advice (50.0%; Figure 4), followed by social media (20.3%). Only 7.9% listed 'healthcare workers' as a source of information (Figure 4).

Patients were asked to list which personal protective measures they were aware of to prevent the spread of COVID-19 infection. Of the 193 patients who said they were aware of personal protective measures, 182 patients (94.3%) were aware of face masks, 165 (85.5%) were aware of hand hygiene, and 160 (82.9%) were aware of social distancing as measures of reducing COVID-19 transmission. Other protective measures patients listed included protective equipment such as gloves, regular testing, and self-isolating if symptomatic.

The majority of patients said that they would still wear a face mask in public all of the time (63.2%), they would still maintain hand hygiene (95.3%), and they would maintain social distance (89.2%).

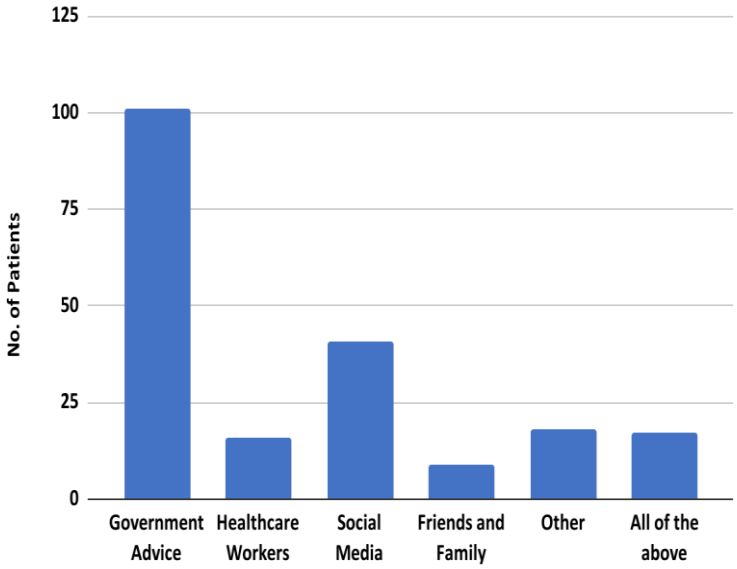
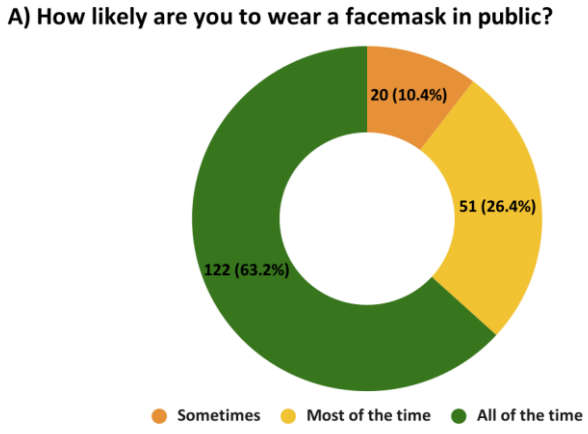


Figure 4: Bar chart showing the number of patients who learnt about personal protective measures against COVID-19 infection from each of the listed sources. Patients were allowed to select more than one source in their response.



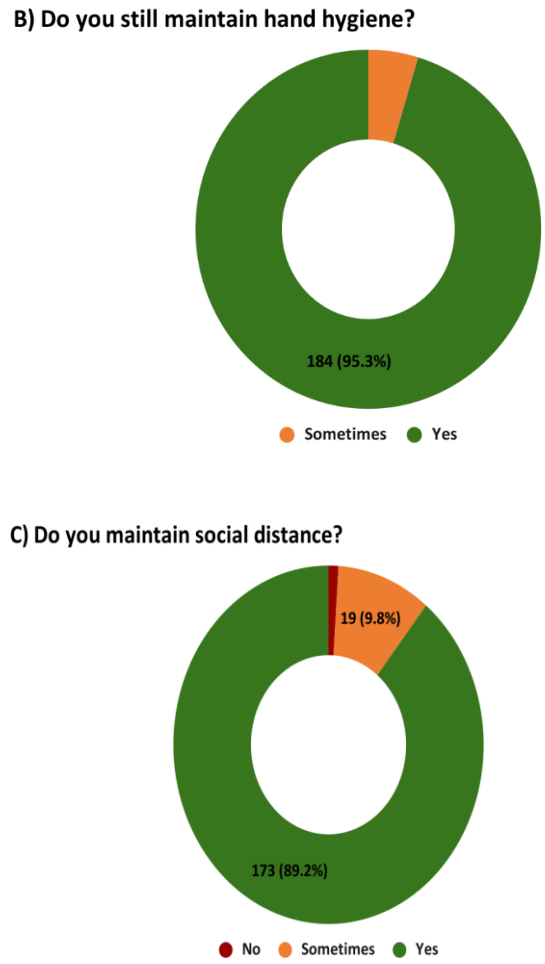


Figure 5: Pie charts showing the proportion of patients who are A) wearing a face mask in public B) maintaining hand hygiene and C) maintaining social distance. Patients were also asked 'How likely are you to wear a face mask in public?', 'Do you still maintain hand hygiene?' and 'Do you maintain social distance?'. The responses are shown in Figure 5.

DISCUSSION

The key aims of the study were to investigate the perceptions, barriers, and acceptance of the COVID-19 vaccination and other recommended guidance during the pandemic amongst surgical inpatients. Quantifying adherence rates provides insight into the risk of COVID-19 infection amongst surgical inpatients while understanding patient compliance, including their underlying opinions and motivations, identifying methods by which we can address concerns, and educating patients. This will better protect both staff and inpatients.

This study was timely and important because it aimed to understand sources of health information accessed by patients and the depth and quality of the information provided regarding both public health guidance and vaccination-specific information. It highlights the role of information dissemination and awareness in making health decisions and adherence to government guidance.

Several coronavirus vaccines have received approval and are available to the public. However, for this to be effective, a vaccine must be acceptable and usable by the majority, achieving 'herd immunity' (12). All participants in this study were aware of the COVID-19 vaccine. A majority were also aware of the public health safety measures (for example, face masks, hand washing, and social distancing) put in place to curb the spread of the virus. The most common method by which participants became aware of these measures was through government public health campaigns. Our findings were similar to a previous study which included 871 participants from the general population in Egypt (13). This study also found that most respondents knew of the vaccines through the government's sensitization initiatives. Although government sources were widely cited as the primary source of information, word of mouth and social media still contributed significantly to our study. The high proportion of patients using these channels as primary information is concerning, given the large potential for misinformation.

Unfortunately, our cohort's high awareness of the vaccination program did not translate to the knowledge of the vaccine itself; only 30.9% of those who had the Pfizer Biontech vaccine correctly identified it as an RNA vaccine. Only 1 out of 88 who had the Oxford AstraZeneca could correctly identify it as a viral vector vaccine. Other indicators of vaccine knowledge were explored, including the knowledge of its adverse effects. Headache, fever, and chills were the most common adverse effects mentioned by participants. Only one participant mentioned symptoms consistent with an allergic reaction to this vaccine. These effects can be generally associated with other vaccines, for example, the influenza vaccination, which is taken annually by many. Whether or not these reported effects were particularly worse with this vaccine compared to others is beyond the scope of this study and was not considered.

Therefore, although patients showed good health information-seeking behaviors, concerns arise around the depth and quality of the information in circulation and patient understanding of the information. While knowledge of the scientific mechanism of action of a vaccine may not increase compliance, understanding adverse effects is important, particularly in new vaccines, and has been shown to affect compliance (14). Careful consideration of how information related to vaccines is disseminated to the general public and a review of the types of information produced by the government and NHS during the pandemic may help inform future vaccine campaigns. This will be important for compliance with booster vaccines in future years or if alternative vaccines are required for future strains. Good quality information will help patients make more informed choices and increase compliance.

We observed that only 4 participants (2%) reported not believing in the vaccine on vaccine hesitancy. We compared this with findings obtained by Syan S K et al. (15), where it was reported that over half of participants were unwilling to receive the vaccine, citing a lack of trust. Another study of over 18,000 participants from European countries, including the United Kingdom, reported a lack of trust and conspiracy theories related to the vaccine as common reasons for lack of compliance (16). Overall, the participants surveyed in our study showed high compliance compared to other studies that reported high levels of vaccine hesitancy, particularly in high-income countries (17). Higher compliance in this study could reflect the underlying health status of these patients, with those who have existing medical conditions being more aware of the negative effects of COVID-19 infection.

In this study, more than half of the unvaccinated patients were female, most of whom reported not yet being offered the vaccine. This did not represent an unwillingness to accept vaccination, compared to findings reported in the United States and Israel (18) (19) which found that females were less willing to receive the vaccination.

The vast majority of participants had received a dose of the vaccine, while almost half had received both doses. Of those who had two doses, the mean interval between both was ten weeks. This would represent good compliance with government guidance at the time of data collection when the vaccine had been offered to all individuals over 40 years of age.

Finally, regarding knowledge and adherence to public health advice to curb the spread of the virus, about 95.5% of participants agreed to know these measures. Only 2 participants admitted to not practicing them, and three thought they were not helpful. Detailed analysis, as shown in the results, reveals that the majority of the participants were doing their best to comply with health and safety measures to curb the spread of this virus. However, the motivation for compliance was not assessed in this study.

In this cohort of surgical patients, there was good adherence to the vaccination program, and patients generally followed public health measures closely. Not only is vaccination beneficial for the individual, but it will also help protect other vulnerable surgical patients, for example, those with malignancy who have been shielded in the community, as well as members of staff. This is reassuring as peri-operative exposure to COVID-19 infection is associated with poorer outcomes and increased mortality (20).

CONCLUSION

The response to COVID 19 pandemic is a clear indicator of people collaborating with the government to achieve better outcomes. While we commend the government's efforts through her agencies in information dissemination and the rollout of the vaccine program, we advise that more can be done in the area of improving the depth and quality of information available. People are more likely to adhere to medications if they understand the constitution, side effect profile, adverse effects, efficacy, and benefits. This holds for all health intervention programs and policies. Finally, health workers should serve as advocates of positive action by being more proactive in sharing factual information, up to date, and easy-to-understand issues as important as a pandemic. They should be empowered to do so by continuous medical education activities.

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