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How the Covid-19 pandemic affected shoulder and elbow practice in Turkey?



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Background: The Covid-19 pandemic drastically affected the health care delivery worldwide. Elective surgical interventions were cancelled or postponed to avoid disease transmission and excessive consumption of critical hospital resources. The main objective for composing this survey was to document the preventive attitude and its variations against the Covid-19 pandemic in a specific group: shoulder and elbow surgeons. The secondary objective was to evaluate their perception of emergency and to envisage the “new normal” with the altered order of priority in the upcoming post-coronavirus era.

Methods: An anonymous survey composed of 25 questions was sent to all the members of the Turkish Society of Shoulder and Elbow Surgery in April 22-29, 2020, while governmental preventive measures were maximal. A secure web-based application (SurveyMonkey Inc., San Mateo, CA, USA) was used for the composition of the survey and the analysis of the responses.

Results: Eighty-eight responses were collected from 129 members of the Turkish Society of Shoulder and Elbow Surgery (68%), with a mean 13.9 years of practice in shoulder and elbow surgery. A more than 75% decrease in surgical and outpatient clinical activity was documented. Half of respondents used telemedicine, and the rate of obtaining informed consent remained low. The preventive attitude showed significant variation.

Discussion: The perception of emergency and the protective measures showed a wide discrepancy among our respondents. Almost 80% of our respondents indicated the necessity of task forces for composing protocols to maintain subspecialty practice under adequate protective measures, and the subspecialty societies as the most eligible institutions to compose these criteria.

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Toward the end of the year 2019 an infectious disease outbreak emerged in China and rapidly spread around the globe starting the first and hopefully the last pandemic of the century. The causative agent was identified as a novel type of coronavirus, and because there was not a single person immune to the virus, the infection disseminated almost immediately without any resistance. The critical patient overload rapidly burned out the capacity of health care delivery, and as a preventive action, Turkish Ministry of Health recommended to suspend all elective surgical interventions on March 17, 2020.⁶ Adaptive changes and complementary measures emerged as a quick reaction.

The pandemic affected almost all the countries in the world; however, the impact was somehow heterogeneous. Even though this phenomenon has many unknown explanations, it depends roughly on a country's capacity of health care delivery, demographic characteristics, and effectiveness of the administrative

actions.¹ Nevertheless, it is obvious that the preventive attitude needs to be customized and adjusted according to the penetrance of the disease in this very population.

A subspecialty surgeon may not be considered as a first-line combatant of the Covid-19 disease; however, one must admit that no other practitioner spends more than 2 hours in the same room with a Covid-19 patient. Despite the recommendations for protective measures to offer guidance, many health care providers were infected with coronavirus, including orthopedic surgeons.⁷ At the end of the day, the precautions implemented depended on the availability of personal protective equipment (PPE), the workload, and the behavior of the health care provider.

The main objective for composing this survey was to document the preventive attitude and its variations in a specific group: shoulder and elbow surgeons. The secondary objective was to evaluate the perception of emergency in the field of shoulder and

Institutional review board approval was not required for this survey study.

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elbow surgery and to envisage the “new normal” for the Turkish community of shoulder and elbow surgeons with the altered order of priority in the upcoming post-coronavirus era.

Methods

We performed an anonymous electronic survey (Supplementary Appendix S1) among the members of the Turkish Society of Shoulder and Elbow Surgery from April 22 to 29, 2020, while highest confinement measures were in place. Contact information was obtained either from the Turkish Society of Shoulder and Elbow Surgery or from Turkish Association of Orthopaedics and Traumatology secretariats. The minimum number of respondents was calculated as 88, with 90% of confidence interval and 5% margin of error. The respondents were contacted through emails in the first place, and on the phone in case of no return in 3 days. The survey was created, and the responds were analyzed using a secure web-based application (SurveyMonkey Inc.).

Results

All of the 129 members of our society were contacted, and 88 responses (68%) were received. Our survey was composed of 25 questions as 1 single text box, 11 multiple choices, 13 checkboxes, and the option of writing an “other than above” section was available at 10 questions for participants’ additional feed. Our questions can be arranged in 5 groups.

Respondent demographics

Five questions were designated to picture the distribution of the respondents to different medical institutions, to quantify their involvement in the shoulder and elbow surgery, and to reveal whether or not they have played an active role in the treatment of coronavirus pneumonia. The mean time that the participants predominantly treated shoulder and elbow patients was 13.9 years. The majority of our respondents were the state university staff (27.27%), closely followed by private hospitals (26.14%) and private universities (19.32%). A vast majority (85%) of these institutions were qualified as pandemic hospitals; however, only 27.27% of our respondents were directly involved in the primary care of Covid-19 disease.

Outpatient clinical activities

Four questions were allocated to measure the effect of the pandemic on the daily outpatient clinical activities of the participants, to identify the minor interventions that are discontinued, and to document the methods used for temporizing postponed elective cases. More than 95% of our respondents reported a significant decline in their general practice, indicating a more than 75% decrease in the number of surgical interventions and outpatient clinical visits. Nearly half (48.86%) of our participants provided online medical support for their patients, and a vast majority (72.34%) used the application called WhatsApp for this purpose.

Among the respondents who sustained outpatient clinical practice, 70.59% did not stop subacromial steroid injections and 45.59% continued intra-articular steroid injections as well. Eleven participants (12.5%) reported that they have completely stopped all injections because of the pandemic. Postponed elective cases were managed with a home exercise program by 56.98% of our practitioners, followed by continuous nonsteroid anti-inflammatory agents or narcotic analgesics by 51.16%, immobilization in a sling by 48.84%, and with steroid injections by 32.56%. Interestingly, skillful neglect was higher than we expected with 29%.

Management of the surgical load

Four questions enabled us to visualize the effect of the pandemic on the surgical activities and to set forth the variations in the perception of emergency among participants. Our survey demonstrated that the majority of the participants (92.86%) discontinued elective surgical interventions. However, a second checkbox question proposed different clinical manifestations to the respondents, seeking to identify which ones they would consider as an emergency. Fractures with surgical indications were selected unanimously, yet there was a significant variation in the understanding of an emergency case (Table I).

Protective and complementary measures

There were 8 questions related to the precautions and complementary measures that have been taken by our respondents. These questions intended to reveal the respondent’s attitude toward the use of PPE and testing. Almost half (47.13%) of our participants supported that the Covid-19 test must be performed for every patient. Contrarily, 19.75% of respondents operated their patients using adequate protective equipment, assuming that the patient is Covid-19 positive regardless of the test results. The percentage of the surgeons who did not have confidence on the test results was 14.9%. The criteria for which the respondents perform a preoperative Covid-19 test were as follows: a suspected or probable contact with a patient with Covid-19 (39.51%); manifestation of Covid-19 symptoms (39.51%); and computerized tomography (CT) findings suggestive of Covid-19 (28.40%).

When we asked whether the preventive preoperative measures were taken by our participants, the 3 major responses were as follows: inquiring Covid-19 symptoms (87.50%), measuring the body temperature (85%), and inquiring the patient’s contact history (81.25%). Twenty-nine of 88 respondents (36.25%) reported that they performed a thorax CT scan before surgery. Preoperative polymerase chain reaction testing was used by 33.75% and a quick Covid-19 Card test by 17.50%. The protective equipment used during the surgical interventions and outpatient clinical activities is summarized in Table II.

The most common preventive measure taken by our respondents during outpatient clinical settings was providing the patient with a surgical mask (81.61%). The limitation of attendant during consultation (70.11%), measuring body temperature (50.57%), inquiring symptoms related to Covid-19 were other protective actions that had been taken.

Medicolegal perspective and aftermath

The final section of our survey included the questions related to the medicolegal issues that may pose the Covid-19 pandemic and

Table I
Which of the following cases did you operate, or would you consider operating during the Covid-19 pandemic?

Answer choices	Responses
Fractures with surgical indication	88.10%
Revision arthroplasty in infection	34.52%
Rotator cuff repair younger than 50 years old	19.05%
Global capsular release in frozen shoulder	13.10%
Arthroscopic debridement and/or repair in calcific tendinitis	11.90%
Collateral ligament reconstruction of the elbow	9.52%
Arthroscopic Bankart repair	8.33%
Reverse shoulder arthroplasty in shoulder osteoarthritis	2.38%
Latarjet procedure	1.19%
Revision arthroplasty in aseptic loosening	0%

Table II
Personal protective equipment used in different areas of health care delivery

Protective equipment	Outpatient clinic and orthopedic ward	Operating theatre
Surgical gloves	46.59%	Standard
Surgical gown	13.64%	Standard
Surgical mask	72.73%	Standard
Hair net	23.86%	Standard
N95/FFP2 mask	37.50%	64.56%
Eye protection goggles	31.82%	77.22%
Face shield	21.59%	39.24%
Full body isolation gown	2.27%	20.25%
Surgical space suits	None	7.59%

the respondents' concerns on the early post-Covid-19 period. A majority of our respondents (67.44%) considered suspending the elective cases as the most reasonable measure that would avoid medicolegal issues. A revision of the informed consent forms to include information on the Covid-19 pandemic and its possible consequences was executed by 41.86% of our participants. Twenty percent of participants asked the patient to write with his or her own handwriting a few phrases related to Covid-19 at the bottom of the current forms. Only 1 respondent had video recording while informing the patient, and 7 took no action on this matter.

Among the telemedicine users, we documented a very low tendency (10.77%) to collect an informed consent for their online medical service.

The circumstances of the post-Covid-19 era were identified as a major concern among our participants. A vast majority (86.21%) indicated that the economic conjuncture subsequent to the pandemic would be detrimental for the health care delivery. The second most emphasized concern was related to the tight schedule of the postponed scientific events (51.72%). These were closely followed by the difficulties in performing elective interventions due to overcrowded operating theatres (42.53%) and insufficient hardware supply by the industry (37.93%).

Discussion

The main objective of our survey was to materialize the general opinion of Turkish shoulder and elbow surgeons on the impact of the Covid-19 pandemic; nevertheless our results can be generalized to all subspecialty surgeons who are not directly involved in the primary treatment of the patients with coronavirus. Our question inquiring the necessity to build a specific protocol for regulating our subspecialty practice during pandemic was answered as "yes" by 76.14% of our respondents. The reason behind the majority's opinion is most probably the lack of preparedness for such a state of emergency. A previously published study evaluating the readiness for a potential Ebola virus pandemic reported that a significantly more effective response can be set out if the attitude toward the cause is harmonized.¹⁹

It is evident that an unexpected interruption in the activity of a subspecialty leads to an uncontrolled congestion of the patients.¹¹ A recent publication of the COVIDSurg Collaborative estimated that more than 12 million operations have been cancelled or postponed globally during the 12 weeks of disruption in the health care delivery.⁴ A vast majority of the shoulder and elbow surgeons reported that they performed only emergency operations during the pandemic. Nevertheless, the perception of emergency showed a wide discrepancy among our survey's respondents. Besides the fractures with surgical indications, revision arthroplasty of periprosthetic infections (34.52%), distal biceps tendon repairs (26.19%), and rotator cuff repairs in patients younger than 50 years (19.05%)

have been indicated operable during the pandemic. The high percentage of answers in favor of discontinuing the elective cases must be evaluated in light of this lack of consensus.

The high risk of serious complications after elective surgery during pandemics has been recently reported.¹² Apparently, in order to avoid high rates of mortality and intensive care admissions, a concise definition of "the emergency" must be put forth. However, our results justified Warner et al¹⁴ in the way that the shoulder and elbow surgeons were not able to draw the red line and postpone all other cases that did not meet that definition. Thus, we suggest the elaboration of a concept, namely "elective with priority," that may comprise the elective cases susceptible to deterioration when left untreated for a relatively short time. Randelli and Compagnoni¹⁷ described the concept as "elective surgery not deferrable" and included traumatic tendon injuries and septic disorders in accordance with our participants. Contrary to their indications that comprise general practice of orthopedics and traumatology, none of our respondents considered aseptic loosening of joint replacements as an emergency. American College of Surgeons published an elective case triage guideline on March 24 and recommended to schedule any fracture, joint dislocations, any infection, and acute onset of neurologic complaints, immediately.³ A more extensive scoring system described by Prachand et al¹⁶ integrates 3 groups of factors that may play a role in decision-making: the consumption of critical hospital resources and the risk of perioperative disease transmission were assessed as "procedure factors"; availability of an equally effective nonoperative treatment and the impact of a delay in surgical difficulty, risk, and outcomes were evaluated as "disease factors"; and finally, the patient factors comprised the elements that predispose a patient to a more severe course of Covid-19. A higher score indicates a poorer outcome, an increased risk of disease transmission, and an excessive consumption of hospital resources. Although being useful and comprehensive, Prachand's score does not include poor quality of life and sleep deprivation, which are often associated with shoulder disorders. Finally, American Academy of Orthopaedic Surgeons has published guidelines to adjust the surgical activity according to the prevalence of the virus and the availability of resources locally.² However, considering that the crisis management is nationwide and the resources are transportable, the equipment would be dispersed homogeneously rather than to be stacked on a single center. The prioritizing of surgical indications is beyond the scope of this study, and we suggest that the subspecialty societies are the most eligible institutions to compose the necessary criteria.

There was a significant variation in the PPE protocol among our survey participants (Table II). The disparity of the answers can be explained by limited availability of the equipment in different institutions and personal behavior of self-protection. United Kingdom Public Health England published guidance on March 27, 2020, for surgical aerosol-generating procedures particularly for operations requiring high-speed power tools. Their recommendations included level 4 surgical gowns, face shield or goggles, double gloves, and a high level of filtering facepiece such as FFP2 or FFP3.¹⁰ Our survey has demonstrated that these requirements are far from being fulfilled, especially because of the limited and expensive equipment. A particular interest is in wearing a positive-pressure exhaust suit, known as a surgical space suit, which was used by only 7.59% of our respondents. Makovicka et al¹³ have recently validated the superiority of this gowning system in a cadaveric knee arthroplasty simulation. Previously, Hirpara et al⁹ performed a quantitative assessment of surgical hoods and demonstrated that 50.60% of

blood cover was outside the area protected by goggles and 45.40% of blood splashes were not retained by the protective visors. Despite being expensive, surgical hoods have been proven to be effective for protecting primarily the surgeons, different to their previous purpose.

Reducing the number of health care staff during surgical interventions has been previously recommended.^{5,8,17} A majority of our respondents (56.96%) abided by this recommendation in order to limit the transmission of the disease and conservation of the critical resources.

Our survey has briefly evaluated the participants' insight toward the post-Covid era. The main concerns were the financial crisis and the increase in health care expenses that may reasonably impede the health care delivery (86.21%). O'Connor et al¹⁵ recognized these worrisome projections comparable to the Great Depression of the United States in 1929, while emphasizing the entangled system of health economics. Kort et al¹¹ further evaluated this concern taking into account the excessive demand that may exceed the available resources after the resumption of the elective surgeries. However, only 37.93% of our respondents were concerned about the overwhelming industry that may struggle to meet demand. Furthermore, limited availability of hospital beds and reduced operating theatre efficacy because of preventive measures were indicated by 42.53% of our respondents. It can be deduced that the shoulder and elbow surgeons in Turkey are relatively reassured by means of health care infrastructure but concerned about its economic accessibility. Warner's picture for the post-Covid era is far more constructive and optimistic,¹⁴ suggesting that orthopedic surgery will adapt the new norms with creative thinking and innovation.

Finally, we documented that the shoulder and elbow surgeons were reluctant to collect an informed consent for their online medical support, with only 10.77% of the participants requesting such a document. In an era where health care providers are ruthlessly cornered with medicolegal issues, we suggest that such evidence is fundamental for supporting our accountability. In the United States, the Office for Civil Rights implemented specific regulations for telehealth, providing an enforcement discretion to the authorities for not imposing penalties for noncompliance with the regulatory requirements.^{2,18} However, these regulations, based on the good faith provision, essentially focus on the dissemination of personally identifiable information and do not cover the medical malpractice issues that the health care provider may encounter. Considering the absence of a regulatory framework specific to telemedicine in Turkey, we call out the subspecialty societies for the composition of the informed consent document that would be obtainable online.

Conclusion

The first pandemic of the millennium has been countervailed with variable reactions by Turkish shoulder and elbow surgeons. Today, the situation is not improving any better with the death toll exceeding 800,000, and the second waves have started to be pronounced in countries that claimed to have eliminated the virus. Although "trial and error" is the only method at hand, suspending all nonessential surgical interventions has been proven to be useful for limiting the transmission of the disease and sparing critical resources. However, because the end of the pandemic cannot be foreseen, we suggest the formation of task forces for composing protocols to maintain subspecialty practice under adequate protective measures.

Disclaimer

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Supplementary data. Appendix S1

Survey questions: how the Covid-19 pandemic affected shoulder and elbow practice in Turkey?

Question 1: What type of medical facility are you currently affiliated?

- a) State University Hospital
- b) Education Research Hospital
- c) State Hospital
- d) Private Medical Center
- e) Private or Foundation University
- f) Private University

Question 2: What is the percentage of the shoulder and elbow patients in your daily practice?

- a) 75%-100%
- b) 50%-75%
- c) 25%-50%
- d) Less than 25%

Question 3: For how many years have you been treating predominantly shoulder and elbow patients?

Question 4: Was your medical facility assigned as a pandemic hospital during the Covid-19 pandemic?

- a) Yes
- b) No

Question 5: Was your daily practice affected by the Covid-19 pandemic?

- a) Yes, complete cessation of surgical and outpatient clinical activities.
- b) Yes, very important decrease in surgical and outpatient clinical activities.
- c) Yes, my surgical and outpatient clinical activities are somewhat affected.
- d) No, Covid-19 did not affect my surgical and outpatient clinical activities.

Question 6: How your weekly number of outpatient consultation changed since the first case of Covid-19 was declared on March 11.

- a) No significant change
- b) Decreased less than 25%
- c) Decreased 25% to 50%
- d) Decreased more than 50%
- e) I totally ceased my outpatient activities

Question 7: Have you performed telemedicine activity during the Covid-19 pandemic?

- a) Yes
- b) No

Question 8: Which application did you use if you performed telemedicine activity?

- a) Zoom
- b) Skype
- c) WhatsApp
- d) Face Time
- e) Cisco
- f) Teams

Question 9: Have you used a particular informed consent for your telemedicine activities?

- a) Yes
- b) No

Question 10: Which personal protective equipment did you use during your outpatient clinical activities and orthopedic ward rounds?

- a) Surgical gloves
- b) Surgical gown
- c) Surgical mask
- d) Hair net
- e) N95/FFP2 mask
- f) Eye protection goggles
- g) Face shield
- h) Full body isolation gown
- i) Surgical space suits
- j) I did not use any protective equipment

Question 11: Which of the following protective measures did you implement before receiving a consultation?

- a) Ask patient's contact history
- b) Ask for influenza-like illness symptoms
- c) Measure patient's body temperature
- d) Provide the patient with a mask
- e) Limit the number of companies
- f) None of above

Question 12: Which of the following small interventions did you continue to perform during the Covid-19 pandemic?

- a) Subacromial space corticosteroid injections
- b) Intra-articular corticosteroid injections
- c) PRP injections
- d) Stem cell applications
- e) Viscosupplementation injections
- f) Trigger point local anesthetic injections

Question 13: Did you continue using nonsteroid anti-inflammatory drugs (NSAID) during the pandemic?

- a) I prescribed when necessary
- b) I did not use in patients with high risk of Covid-19 infection
- c) I did not use in any of my patients
- d) I only used in postoperative period
- e) I only used it in severe inflammatory pain

Question 14: How your weekly number of operations changed since the first case of Covid-19 was declared on March 11

- a) No significant change
- b) Decreased less than 25%
- c) Decreased 25% to 50%
- d) Decreased more than 50%
- e) I did not operate any patient since that date

Question 15: Which types of surgeries do you continue to perform?

- a) Elective surgeries
- b) Emergencies
- c) Same day patient pathway cases
- d) I do not operate any patient.

Question 16: Which personal protective equipment did you use during your operations?

- a) Surgical gloves
- b) Surgical gown
- c) Surgical mask
- d) Hair net
- e) N95/FFP2 mask
- f) Eye protection goggles
- g) Face shield
- h) Full body isolation gown
- i) Surgical space suits
- j) I did not use any protective equipment

Question 17: Which of the following preventive measures did you implement during the preoperative preparations of your patients?

- a) Ask patient's contact history
- b) Ask for influenza-like illness symptoms
- c) Measure body temperature
- d) Run a quick Covid-19 test
- e) Run a Covid-19 PCR test
- f) Perform a thorax CT scan
- g) None of above

Question 18: For which emergency patients did you request a Covid-19 test preoperatively?

- a) All emergency patients
- b) All patients with a suspected contact history
- c) All patients with influenza-like symptoms
- d) All patients with positive thorax CT scan findings.
- e) I considered the patient as Covid-19 positive and took precaution.
- f) None of the patients.

Question 19: What is your opinion on the necessity of a preoperatively performed Covid-19 test

- a) Should be requested to every patient
- b) Only request to suspected cases
- c) I find it unnecessary
- d) I do not have confidence in the sensitivity of the test.

Question 20: Which precautions did you take against the medicolegal issues related to the Covid-19 pandemic?

- a) I composed new informed consent documents concerning Covid-19.
- b) I performed a video/voice recording while informing the patient about the risks.
- c) I asked the patient to add a few sentences concerning the risks related to the Covid-19 pandemic, to our institution's regular consent forms.
- d) I completely ceased elective surgeries.
- e) I did not take any precautions.

Question 21: How did you manage the postponed elective cases during the Covid-19 pandemic?

- a) Immobilization with a sling or a brace
- b) Regular intake of nonsteroidal anti-inflammatory drugs (NSAID) or narcotic analgesics

- c) Steroid injections
- d) Injections of local anesthetics or chondroprotective agents.
- e) Stem cell or PRP injections
- f) Exercise program or physiotherapy
- g) Skillful neglect

Question 22: Which of the following cases did you operate, or would you consider operating during the Covid-19 pandemic?

- a) Fractures with surgical indication
- b) Revision arthroplasty in infection
- c) Rotator cuff repair in a patient younger than 50 years
- d) Global capsular release in frozen shoulder
- e) Arthroscopic debridement and/or repair in calcific tendinitis
- f) Collateral ligament reconstruction of the elbow
- g) Arthroscopic Bankart repair
- h) Reverse shoulder arthroplasty in shoulder osteoarthritis
- i) Latarjet procedure
- j) Revision arthroplasty in aseptic loosening

Question 23: Did you perform inpatient or outpatient service duty taking care of Covid-19 patients?

- a) Yes
- b) No

Question 24: Do you think it is necessary to create algorithms to regulate the shoulder and elbow practice during states of emergency?

- a) Yes
- b) No

Question 25: When you consider the early post-Covid-19 era, which of the following circumstances presents an important thread?

- a) Financial crisis and the increase in health care expenses
- b) Overwhelming industry that may fail to meet increased demand
- c) Delays related to the overbooked capacity of the operating theatres
- d) Difficulties in balancing outpatient clinical activities along with the surgical overload.
- e) Competition with other surgical specialties in the procurement of available inpatient beds
- f) Regression in surgical skills
- g) Uncertain schedule of the postponed scientific events