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# Orthopedic Treatment in the Era of COVID-19: Perspectives from a National Survey in Thailand

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**Purpose:** The coronavirus disease 2019 (COVID-19) pandemic has affected the management of patients with non-emergent orthopedic conditions, resulting in postponed surgical intervention(s) and changes in hospital services. Specific guidelines have been issued for emergency orthopedic cases; however, no definitive guidelines have been proposed for the management of elective or non-urgent conditions during the pandemic. As such, physicians have been obliged to make decisions based on their judgment. This study aimed to analyze data regarding changes in general orthopedic practices during the pandemic, especially those pertaining to surgery, clinical procedures, follow-up periods, referrals, and protective equipment.

**Methods:** This study investigated the impact of the COVID-19 pandemic on the management of non-urgent orthopedic conditions by outpatient orthopedists. A questionnaire was developed and shared with nationwide orthopedic social media groups and through e-mails.

**Results** Of the 200 orthopedic surgeons invited to participate, 129 (64.5%) responded. Results revealed that 65.9% of the surgeons preferred conservative treatment to surgery among patients with the appropriate indications. Additionally, follow-up periods were extended in 69.0% of patients, and 70.5% were prescribed more medication. The N-95 mask and home delivery system for medications were the two most desirable protective equipment and innovations that surgeons needed (79.1% and 69.8% of respondents, respectively).

**Conclusions:** The COVID-19 pandemic has led to changes in general orthopedic practices in outpatient clinics, such as a preference for more conservative treatment than surgery, extension of appointment periods, prescription of medicine for a longer period, and use of drug delivery to patients' homes.

**Keywords:** COVID-19, orthopedic, surgery, treatment

The coronavirus disease 2019 (COVID-19) pandemic has had a significant impact on the management of general orthopedic patients, particularly for non-emergency or non-urgent cases, requests for postponement of surgical intervention(s), and switching to nonoperative management. In response, many hospitals have altered their services to comply with public health policies. In 2020, policies regarding insurance and compensation for medical personnel, telemedicine, and patient home care were implemented[1]. Moreover, specific guidelines have been issued for emergency or urgent orthopedic and hand patients requiring surgical treatment[2]. Clough et al. reported a reduc-

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tion in the incidence of postsurgical COVID-19 after elective surgery by limiting the number of visitors and regularly screening doctors, medical personnel, and patients for the disease[3]. Furthermore, Lockey et al. argued that postponing elective surgery was not unethical, and identified urgent and necessary surgeries based on the principles of medical ethics, including autonomy, non-maleficence, beneficence, and justice. Their medical and moral framework classified patients into three groups: those who could postpone surgery without permanent residual pathology; those who could postpone without loss of cost and the operation could be performed later; and those who volunteered to postpone the operation[4]. Despite the pandemic, patients still require elective surgery and prefer admission to avoid crowded outpatient surgical centers. A policy to decrease unnecessary interactions and reduce the number of patients at the hospital has been reported to minimize patient concerns regarding the fear of acquiring COVID-19[5].

This study aimed to determine and report the impact of the COVID-19 pandemic on orthopedic surgeons managing general non-urgent orthopedic conditions in outpatient departments. The survey investigated surgeons' decision-making regarding performing procedures in the office, follow-up appointment period, patient referral decisions, and equipment for outpatient care that can be used routinely in the outpatient department.

## METHODS

The survey instrument used in this study was collaboratively developed by all authors and underwent a thorough review process. The questionnaire consisted of 5 sections: decision-making regarding surgery; clinical procedures; follow-up periods; patient referral; and protective measures. The first section examined the decision to perform surgery during the pandemic along with factors that influenced the decision to postpone surgery, which remains a controversial topic[4]. The second section focused on the trend of performing close-contact procedures in the clinic during the peak pandemic period, given the potential risk for COVID-19 transmission in crowded outpatient settings. The third and fourth sections explored physicians' decisions regarding follow-up periods and patient referrals, with some providers opting to extend follow-up periods or refer patients to avoid crowded waiting rooms. The final section of the questionnaire sought to identify the protective measures that the respondents deemed necessary. Participants were instructed to assume that they were dealing with a non-urgent orthopedic condition, such as carpal tunnel syndrome, without progressive neurological deficits or non-progressive painful knee osteoarthritis during the peak of the COVID-19 pandemic period. This study was exempt from ethics committee review. The questionnaire, presented in *Google Docs* format with a link, was disseminated nationwide to orthopedic social media groups and via email to 200 practicing orthopedic surgeons in public health administration, universities, and private practice settings. To prevent duplication, all potential respondents were required to log into their accounts before completing the questionnaire. The questionnaire comprised binary questions to which participants responded anonymously by indicating their preferences. Of the 200 orthopedic surgeons who completed the questionnaire, 129 responded, corresponding to a response rate of 64.5%. Descriptive statistics were used to analyze the data, which are reported as percentages.

## RESULTS

In terms of the decision to treat non-urgent orthopedic conditions during the COVID-19 pandemic, results of this study demonstrated that the majority of general orthopedists preferred conservative treatment over surgery among patients with the appropriate indication(s) (65.9%). However, the use of alternative medicines was not a popular option among the respondents. Regarding the type of procedure preferred by surgeons, 58.1% preferred fewer contact procedures to direct patient contact. Among those who spent less time with each patient (44.2%), 69.0% extended the follow-up period, and 70.5% prescribed a longer period of medication.

In terms of equipment and innovation required at the outpatient clinic, the N-95 mask and

home delivery system for medication were the top 2 most desirable items preferred by 79.1% and 69.8%, respectively, of the responding surgeons. In contrast, 47.3% of the respondents preferred telemedicine. The complete survey results are summarized in Table 1.

**Table 1** Questionnaire Results.

| Questions | Response | |
|---|---|---|
| | Yes | No |
| Indication for treatment | | |
| Prefer conservative | 85 (65.9) | 44 (34.1) |
| Prefer alternative medicine | 40 (31.0) | 89 (69.0) |
| Procedure | | |
| Prefer local/joint injection | 71 (55.0) | 58 (45.0) |
| Avoid close contact | 75 (58.1) | 54 (41.9) |
| Less time with the patient each visit | 57 (44.2) | 72 (55.8) |
| Follow-up periods | | |
| Longer appointment period | 89 (69.0) | 40 (31.0) |
| Add more medicine supply for patients each visit | 91 (70.5) | 38 (29.5) |
| Prefer discharge from service | 44 (34.1) | 85 (65.9) |
| Refer the patient | 35 (27.1) | 96 (74.4) |
| Equipment for outpatient care | | |
| Essential equipment in | | |
| - N95 mask | 102 (79.1) | 27 (20.9) |
| - Face shield | 65 (50.4) | 64 (49.6) |
| - Personal protective equipment | 42 (32.6) | 88 (68.2) |
| - Screening table partition | 66 (51.2) | 63 (48.8) |
| Telemedicine | 61 (47.3) | 68 (52.7) |
| Drug(s) delivery to home | 90 (69.8) | 39 (30.2) |

Data presented as n (%)

## DISCUSSION

During the COVID-19 pandemic, general orthopedic practice in non-emergency settings has been affected by prolonged follow-up periods, increased conservative management, and a shift toward local injections or alternative treatment instead of surgery. To prevent infection, doctors were provided with N95 masks, face shields, personal protective equipment (PPE), and screening table partitions for use in the outpatient departments. Telemedicine and drug delivery to home services were encouraged during follow-up. These changes affected not only the patients, but also the surgeons. In this article, we describe the protocols implemented during the pandemic and how they affected personal practice in general orthopedic outpatient departments.

Results of our study revealed that surgeons preferred non-contact and conservative methods and avoided close contact practice and surgery. Additionally, the clinical follow-up interval was prolonged during the pandemic. While conservative treatment is preferred not only in Thailand but also in other countries, delayed elective surgery, such as increased pain and deformity, has also been reported[6]. The results reported herein indicate that 68.2% of the respondents tended to extend appointment intervals for follow-up, and 70.5% of the respondents preferred to prescribe medicine for a longer time per visit.

In this study, approximately 47.3% of respondents used telemedicine, and 69.8% preferred delivering home medication services. The low rate of telemedicine usage may be due to the

Personal Data Protection Act (PDPA), which was ambiguous during the pandemic in our country. A lack of knowledge and scarce support for telemedicine technology led to more than one-half of the surgeons not preferring to use telemedicine, fearing personal data leakage, especially for patients in remote areas. The study raised concerns about the small number of surgeons preferring telemedicine despite their preference for prolonging conservative treatment and follow-up time. Telemedicine has proven to be effective in terms of clinical care and rehabilitation, and provides high-quality care and cost-effective satisfaction[7–10]. To prepare for unpredictable situations, such as a pandemic, telemedicine should be improved, with education for the public, and implemented in the healthcare system.

Regarding innovative equipment for outpatient care, most surgeons needed N95 type masks, which made it easier for them to contact patients when performing physical examinations than other equipment, such as screening table partitions or face shields. Only one-third of surgeons required PPE while in close contact with patients. Surgeons rarely referred the patient. Thus, appropriate PPE that meets this demand should reach the patient care team in a limited-resource situation. Resources should be prepared and allocated to the appropriate units or users for unpredictable future pandemics.

The current investigation was a questionnaire survey study conducted through emails and public social media groups, with a good response rate (64.5%) to the questionnaire. However, this may be a limitation of this study because some surgeons' responses may have been missing, particularly those who practiced in rural areas where Internet communication is difficult. Additionally, the study could not identify a group of surgeons from different sectors, such as the public health administration, university, and private practice, who may have had different policies in their hospitals. Each hospital's policies can influence the practices of orthopedists during a pandemic. The scarcity of information regarding the hospital sector could limit generalizability. As such, the inclusion of such information for the hospital sector in future studies could provide clearer results and yield more insights.

## CONCLUSIONS

In conclusion, the COVID-19 pandemic caused changes in some general orthopedic outpatient practices, such as more conservative treatment with less conservative procedures than surgery, and more extended appointment periods by providing more medicine or using drug delivery services to patients' homes. These practices can be adapted to standard practice after the situation is clarified, in which case an analysis of costs and benefits for patients would yield more specific results. Telemedicine may help surgeons in general practice in the future.

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