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¿Ha sido el 2020 un año perdido en la formación de cirugía ortopédica y traumatología? Percepción de los residentes

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¿Ha sido el 2020 un año perdido en la formación de cirugía ortopédica y traumatología? Percepción de los residentes

Introduction
The COVID-19 pandemic has posed the greatest threat ever faced by the Spanish healthcare system. On 14 March 2020, a state of alarm was declared in Spain, a fact that anticipated the subsequent restrictive measures, including the house confinement of the entire population. An extraordinary plan was adopted to minimise the spread of the infection and optimise health resources.

The restructuring of the healthcare system, together with the reduction of emergency activity, the suspension of non-essential outpatient consultations and scheduled surgery, has had a significant impact on medical and surgical practice in Spain. These measures, in addition to the reorganisation of surgical residents in other areas of the hospital due to the lack of healthcare personnel, have posed an unprecedented challenge to the training programmes of orthopaedic surgery and traumatology residents.

Restrictions imposed on academic meetings, teaching and in-service sessions as a strategy to minimise contagion have also forced training centres to resort to online platforms to continue and preserve resident education. This has led to a proliferation of webinars and virtual scientific meetings.

It is essential to assess the impact of the pandemic on residency training programmes and to ensure the implementation of alternative strategies to cope with this situation. This study aims to provide an overview of the impact of the COVID-19 pandemic on the training of traumatology and orthopaedic surgery residents in Spain.

Methods
Study design
A cross-sectional study was conducted using an online survey distributed to trauma residents from 10th February to 28th February 2021.

Study population
The survey was sent via social networks (Whatsapp, Facebook, Twitter and Instagram) as well as by e-mail to orthopaedic surgery and traumatology residents in Spain. To facilitate its dissemination, the survey was shared via a freely accessible link on the social networks of the authors of the study. It was also distributed through the Whatsapp groups of residents according to their year of training. Results were collected from 16 autonomous communities, with the exception of Cantabria.
**Processes**

A questionnaire was developed to collect the opinion of residents on the impact of COVID-19 in the orthopaedic surgery and traumatology training programme. The correct understanding of the survey was validated by a group discussion with 2 residents and a department head: the 3 signatories of the study (MV, MG and AH). A pilot test was carried out with a small group of trauma residents, modifying the questions based on the feedback received.

The final questionnaire was shared via the Google Forms tool (Google Form, Mountain View, CA, USA) through a web link via social media, messaging platforms and email to trauma residents.

The survey consisted of 17 single-response questions (Appendix Banexo in supplementary material). The questions included in the form were subdivided into the following groups:

- General demographic data.
- Curriculum changes.
- Care activity during the pandemic.
- Online training.
- Perspective on the impact of the pandemic.

Data collection via the form was conducted from 10 February to 28 February 2021.

To increase response rates, follow-up messages were sent via social media and email in the first week after the initial consultation and 3 days before the form closed.

It was limited to a single response per participant and IP (a unique number that identifies a device or computer on the internet).

Completion of the survey was completely voluntary and the anonymity of the resident was guaranteed, as no personal identification was required.

**Results**

**Demographic data**

A total of 307 orthopaedic surgery and traumatology residents from all over Spain responded to the survey. It is estimated that there are currently approximately 1,215 active residents (according to the number of specialised health training places offered by the Ministry of Health), which represents a response rate of 25.26%.

The data collected include residents from all the autonomous communities in Spain, except Cantabria. In terms of stratification by years of training, there was a predominance of responses from residents at intermediate levels of training (R2 and R3).
The distribution of responses by Autonomous Community and years of residence is shown in Figure 1.

Changes in the curricular programme

Of the residents surveyed, 77.2% (n = 237) stated that they had undergone changes in their curricular programme. Of these, 70.8% (n = 168) had to suspend their rotations to adapt them to the needs of the service, while the remaining 29.2% were relocated to other services according to the needs of each centre. Only 22.8% (n = 70) claimed to have completed their rotations according to the established schedule.

Once normality was restored, 9.1% (n = 28) recovered lost rotations, 57% (n = 175) did not recover them and do not plan to do so and 12.7% (n = 39) did not recover them but do plan to do so.

Care activity

According to 69.7% (n = 214) of the residents surveyed, more than 60% of scheduled surgery was cancelled during the pandemic period. 26.7% (n = 82) refer that 30-60% of surgical activity was cancelled and 2.6% (n = 8) state that it was less than 30%.

The time (measured in weeks) during which scheduled surgery was completely stopped was around 10 weeks for 47.6% (n = 146).

Regarding telematic consultations, we asked what percentage of face-to-face consultations were telematic. More than 60% of consultations were telematic for 21.5% (n = 66), between 30-60% for 36.5% (n = 112) and less than 30% for 38.8% (n = 119). 3.3% (n = 10) stated that they had not consulted telematically.

Regarding the impact on the training of the residents with the change from face-to-face to telematic consultations, 65.8% (n = 202) stated that it had a negative impact on their training, while 34.2% (n = 105) considered that it did not have a negative impact on their training (Fig. 2).

With regard to the performance of on-call duty, 83.4% (n = 256) did not reduce the number of trauma duty shifts during the pandemic, while 16.5% (n = 51) claim to have reduced it.

During these visits, 73% (n = 224) noted a decrease in usual activity, 16% (n = 49) noted a partial decrease and 11.1% (n = 34) stated that they did not notice a decrease.

Considering that proximal femur fractures are the most frequent fracture in the ED, 35.8% (n = 110) think that they were reduced by less than 30%, 23.8% (n = 73) by 30%-60% and 4.6% (n = 14) by more than 60%. Of all respondents, 35.8% (n = 110) state that the incidence of proximal femur fractures has not been reduced compared to the pre-pandemic era.

Regarding the service's schedule of clinical sessions, 44% (n = 135) state that they were converted to telematics and 13% (n = 40) state that they were unchanged. Clinical sessions
were discontinued altogether for 43% (n=132) of the residents who responded to the survey.

New learning strategies: online training

Online training in its new formats (virtual congresses and webinars or webinars) has been a good way of learning in surgical residents for 13.7% (n=42) and partially good for 49.5% (n=152). Of the total respondents, 36.8% (n=113) consider it is not a good learning pathway.

49.5% (n=152) consider the online provision that has attempted to make up for the lack of face-to-face courses to be insufficient and 18.6% (n=57) do consider it sufficient or partially sufficient 31.9% (n=98).

Subjective perspective on the impact of the COVID-19 on training programmes

The perceived impact of the pandemic was rated by participants as good by 1% (n=3), fair by 10.7% (n=33), bad by 52.1% (n=160) and very bad (one year lost) for 36.2% (n=111).

As a strategy to compensate for the negative impact of the pandemic, 48.2% (n=148) of the participants agreed with the extension of residence for the months affected by the pandemic (Fig. 3).

Discussion

Our study shows that 3 out of 4 orthopaedic surgery and traumatology residents in our country have had their training programme significantly affected.

The COVID-19 pandemic has threatened the training programmes of residents in the different branches of medicine. Specialties such as internal medicine, pneumology or anaesthesia have managed to readapt their curricula to this new situation: critical patient management, airway control and ventilatory support, haemodynamic support options, infection prevention and control measures, etc.

On the other hand, surgical specialties such as ophthalmology, traumatology and general surgery have been greatly affected by reducing their care activity to the bare essentials.

Telemedicine

As the results of our survey show, 96.8% of scheduled consultations have become telemedicine, which has had an impact on the training of 65.8% of residents. The pandemic has resulted in telemedicine becoming the safest form of outpatient clinical care in many hospitals.

Although it is a cost-effective tool, the experience of active clinical learning during telemedicine visits is undermined by the lack of an adequate physical examination. Nevertheless, "telemedicine" is a new skill that should be incorporated into current teaching
programmes because of its proven advantages in chronic patient follow-up, in the postoperative period of hip or knee arthroplasty patients or in rehabilitation visits.

**Surgical skills**

Surgical skills are among the most valuable competencies for trainee trauma surgeons. During the pandemic, surgical practice was substantially limited with the reduction of scheduled surgery. As stated by 69.7% of the residents surveyed, more than 60% of elective procedures were cancelled.

The cancellation of scheduled surgical procedures has not only hindered the surgical skills of residents but will also impact on their future employment, according to 66.8% of respondents.

A reality that highlights the need to promote technological innovation and to allocate time and resources to generate easily accessible tools that favour the training of future traumatologists.

In order to reinforce technical skills and manual dexterity, surgical simulation in virtual environments has proven to be a plausible option for training in traumatology and orthopaedics. A tool that should be complementary to traditional teaching methods.

**E-learning**

As a result of the COVID-19 pandemic, the learning curve in traumatology has undergone significant changes with respect to the programme established by the ministry. For most specialties, this situation has highlighted the need to transfer traditional forms of learning and knowledge dissemination to a virtual environment.

Online surgical training through live or recorded courses and seminars has proven to be effective but insufficient. This is a reality expressed by 81.4% of the residents surveyed, who felt that they had an insufficient or partially insufficient offer.

It is an established fact that online training is unlikely to replace the technical knowledge acquired in the operating theatre. It is therefore essential to look for training alternatives that enrich classroom teaching without reducing the quality of surgical teaching of the MIRs.

In the same way, in order to perpetuate and promote scientific research, traditional trauma congresses have been reinvented. Scientific dissemination via streaming platforms has been a far-reaching alternative. An option that, although it reduces the costs of a face-to-face conference, is not comparable to the human and working relationship of a face-to-face nature.

**Conclusion**

This is the first cross-sectional study to provide relevant information on the impact of the COVID-19 pandemic on the training programmes of orthopaedic surgery and traumatology residents in Spain.

We have lived through a health crisis which, without overlooking the lives lost and having dealt with a disease that changed our lives, has posed a challenge to resident curricula when it comes to providing effective teaching strategies.
The results of the study show a negative impact on training, which highlights the need to continue to provide quality training that maximises learning opportunities.

Restructuring the current training plans with the inclusion of surgical simulation activities, fostering digital skills, implementing regulated webinars and considering the extension of the residency programme in selected cases should be taken into account to ensure quality training.

**Limitations**

This study has some limitations: 1) The response rate is low, the survey was shared through word of mouth, social networks and email, entrusting its dissemination to the authors of the study and its participants. 2) Participation was voluntary and open access. This means that there were no responses from specialists in training in Cantabria, nor could it be guaranteed that the responses obtained were exclusive to traumatology residents. 3) Finally, the denominator of the people who received the survey is uncertain, given the method of distribution.

**Level of evidence**

Level of evidence III.

**Ethical responsibilities**

Protection of humans and animals. The authors declare that no experiments on humans or animals have been performed for this research.

**Conflict of interests**

The authors have no conflict of interest to declare.

**Appendix A**

Additional material can be found in the electronic version of this article at doi:10.1016/j.recot.2021.06.003.

**Appendix B**

Additional material
References

Figure 1 a) Distribution of residents by community. b) Distribution by years of residence. Gr.1.

| Distribución de residentes por comunidades | Distribution of residents by community |
| Distribución por años de residencia       | Distribution by years of residence    |

Figure 2 a) Volume of telematic consultations. b) Have telematic consultations had a negative impact? Gg.2.

| Volumen de consultas telemáticas | Volume of telematic consultations |
| No se han hecho telemáticas     | No telematic consultations        |
| ¿Han repercutido negativamente las consultas telemáticas? | Have telematic consultations had a negative impact |
| Sí                              | Yes                              |

Figure 3 a) Perceived impact of the pandemic. b) Do you agree with extending residency? Gr.3.

| Impacto percibido de la pandemia | Perceived impact of the pandemic |
| ¿Estás de acuerdo con alargar la residencia? | Do you agree with extending residency? |
| Sí                              | Yes                              |
| Muy bueno (o muy bueno (o positivo) (positivo) | Very good (or very good (or positive) (positive) |
| Regular (indifferent)           | Fair (indifferent)               |
| Malo (negativo)                 | Bad (negative)                   |
| Muy malo (muy negativo: un año perdido) | Very bad (very negative: one year lost) |