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Effects of the COVID-19 Pandemic on the Management of Spinal Disorders – Results of a National Survey

Auswirkungen der COVID-19-Pandemie auf die Behandlung von Wirbelsäulenerkrankungen – Ergebnisse einer nationalen Umfrage

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ABSTRACT

Introduction Far-reaching political steps to contain the COVID-19 pandemic have been undertaken in recent weeks. These also impact on surgical specialties not directly involved in the management of patients infected with the coronavirus. The Spine Section, the interdisciplinary professional political arm of the German Spine Society (DWG), the Professional Association for Orthopedic and Trauma Surgery (BVOU), and the Federal Association of German Neurosurgeons (BDNC) conducted a survey on the collateral effects of the pandemic on spine surgery in Germany.

Method This cross-sectional study included outpatient, day-patient and inpatient facilities caring for patients with spinal disorders during the COVID-19 pandemic. The survey was designed to analyse the impact of the COVID-19 pandemic on the management of inpatients and outpatients with spinal disorders and to assess the economic ramifications in the various settings.

Results All members of the Spine Section (n = 134) were invited to participate in the questionnaire consented by BVOU and BDNC. The questions were answered anonymously, and the personal data entered did not permit any de-anonymisation. All in all, 68% (n = 91) of the respondents completed the survey in full. Based on the type of employment (practice 30%, practice/staff: 45% and staff: 25%) and range of activities (conservative: 5%, conservative/operative: 75%, operative: 20%) the survey by the Spine Section can be regarded as representative. 95% of the practices/outpatient clinics reported a decline in their number of patients. In addition, the number of operations performed fell by 36% (SD 17%). The percentage of elective procedures declined from approximately 78% to 6%. As a result, more than half of the physicians anticipated moderate (20–40%) economic challenges and 25% major (> 50%) financial problems.

Conclusion In order to cushion collateral damage in the wake of future pandemic management, any implications in the interdisciplinary management of patients with spinal disorders should be based on these results.

ZUSAMMENFASSUNG

Einleitung Weitreichende politische Maßnahmen zur Eingrenzung der COVID-19-Pandemie wurden während der letzten Wochen ergriffen. Diese betreffen auch chirurgische Fach-

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richtungen, die nicht direkt in die Behandlung von Coronavirus-Infektionen bei Patienten involviert sind. Das Referat Wirbelsäule, die fachübergreifende berufspolitische Einrichtung der Deutschen Wirbelsäulengesellschaft (DWG), des Berufsverbandes der Fachärzte für Orthopädie und Unfallchirurgie (BVOU) sowie des Bundesverbandes Deutscher Neurochirurgen (BDNC) führte eine Umfrage zum kollateralen Effekt der Pandemie auf die Wirbelsäulenchirurgie in Deutschland durch.

Methoden In dieser Querschnittsstudie wurden ambulante, teilstationäre und stationäre Versorgungseinrichtungen von Patienten mit Wirbelsäulenerkrankungen während der COVID-19-Pandemie eingeschlossen. Das Ziel der Umfrage war die Analyse, welche Folgen die COVID-19-Pandemie auf die Betreuung von ambulanten und stationären Patienten mit Wirbelsäulenerkrankungen hat und wie die wirtschaftlichen Konsequenzen in den verschiedenen Bereichen eingeschätzt werden.

Ergebnisse Der vom BVOU und BDNC konsentierte Fragebogen wurde an alle Mitglieder des Referats Wirbelsäule versandt (n = 134). Die Beantwortung der Fragen erfolgte anonym und die personenbezogenen Daten erlaubten keine Deanonymisierung. Insgesamt 68% (n = 91) der Befragten führten die Befragung vollständig durch. Aufgrund der Beschäftigungsverhältnisse (Praxis: 30%, Praxis/Angestellte: 45% und Angestellte: 25%) und des Tätigkeitsspektrums (konservativ: 5%, konservativ/operativ: 75%, operativ: 20%) kann die Umfrage im Referat Wirbelsäule als repräsentativ angesehen werden. Bei 95% der Praxen/Ambulanzen wurde eine Reduktion des Patientenaufkommens beobachtet. Darüber hinaus erfolgte eine Reduktion der OP-Zahlen um 36% (SD 17%). Der Anteil der elektiven Eingriffe wurde von ca. 78 auf 6% reduziert. Daraus resultierend prognostizieren über die Hälfte der Ärzte/-innen mäßige (20–40%), 25% aber auch deutliche (> 50%) wirtschaftliche Schwierigkeiten.

Schlussfolgerungen Zukünftige Implikationen im interdisziplinären Bereich der Versorgung von Patienten mit Wirbelsäulenerkrankungen sollen auf Grundlage der vorliegenden Ergebnisse abgeleitet werden, um die kollateralen Effekte einer Pandemiebewältigung zukünftig zu verbessern.

Introduction

Rarely has an illness resulted in such drastic repercussions in the social and economic fabric worldwide as the COVID-19 pandemic, which originated in December 2019 in Wuhan, China. The first case of COVID-19 in Germany was diagnosed in Starnberg County in Bavaria on January 27, 2020 [1]. At that time, the "Task Force Infectious Diseases" of the Bavarian Health and Food Safety State Administration (LGL) and the federal Robert Koch Institute (RKI) still judged the risk of infection for the population as low [2]. On17 March 2020, the RKI classified the risk of infection in Germany as "high" and on 26 March 2020, as "very high" [2]. On March 11, 2020, the WHO officially declared COVID-19 a pandemic with corresponding recommendations for the population [3]. On 27 March 2020, the law on the protection of the population in the event of an epidemic situation of national importance was enacted in Germany [4]. This law restricted the daily life of people in numerous ways.

In the health care sector, the institutions were readied for unprecedented case loads. In particular, hospitals were preparing for a high volume of patients with COVID-19 infection. All elective treatments were to be postponed. Physicians and other healthcare professionals were told to restrict treatment solely to urgent and emergent cases. In this context, the boards of the scientific societies and professional associations reviewed the indications for treatment.

Since the majority of treatments in spinal disorders can be classified as elective and, for example, pain management in degenerative spinal diseases is not primarily considered an emergency indication, there was a massive decline in the number of such patients. As a result, and to keep beds open for patients infected with SARS-CoV-2, operations had to be cancelled. Since the health care system was focused on COVID-19 cases, patients with other diseases no longer presented as outpatients in practices. At the same time, many medical practices had to reduce their office hours because of still inadequate supplies with personal protective equipment.

In order to assess the impact of these measures, a questionnaire was mailed on 11 April 2020 to physicians specialising in spinal therapy. The survey was designed to analyse the ramifications of the COVID-19 pandemic on the management of inpatients and outpatients with spinal disorders and to assess the economic repercussions in the various sectors.

Method

The questionnaire specifically developed for the survey comprised 20 questions and was divided into three main sections (Appendix 1). The first section of the questionnaire focused on the outpatient treatment of patients with spinal disorders. The questions in this section addressed outpatient clinic times, patient volume and referral behaviour. The questions in the second section dealt with spinal surgery and its frequency. The third chapter asked for the personal impact assessment of the COVID-19 pandemic. Also, a box at the end of the questionnaire allowed free text to be entered.

The questionnaire was sent out on 11 April 2020 and the survey was completed on 11 May 2020. The physicians contacted were asked to answer the questionnaire during the maximum impact of the legal restrictions imposed on public life. The questionnaire was emailed to 134 physician members of the Spine Section. The questions were answered anonymously. The completed questionnaires were emailed or faxed back to the sender. 91 of the physicians contacted (response rate 68%) responded with a completely filled out questionnaire within 4 weeks. 80% of the respondents decided to reply by fax.

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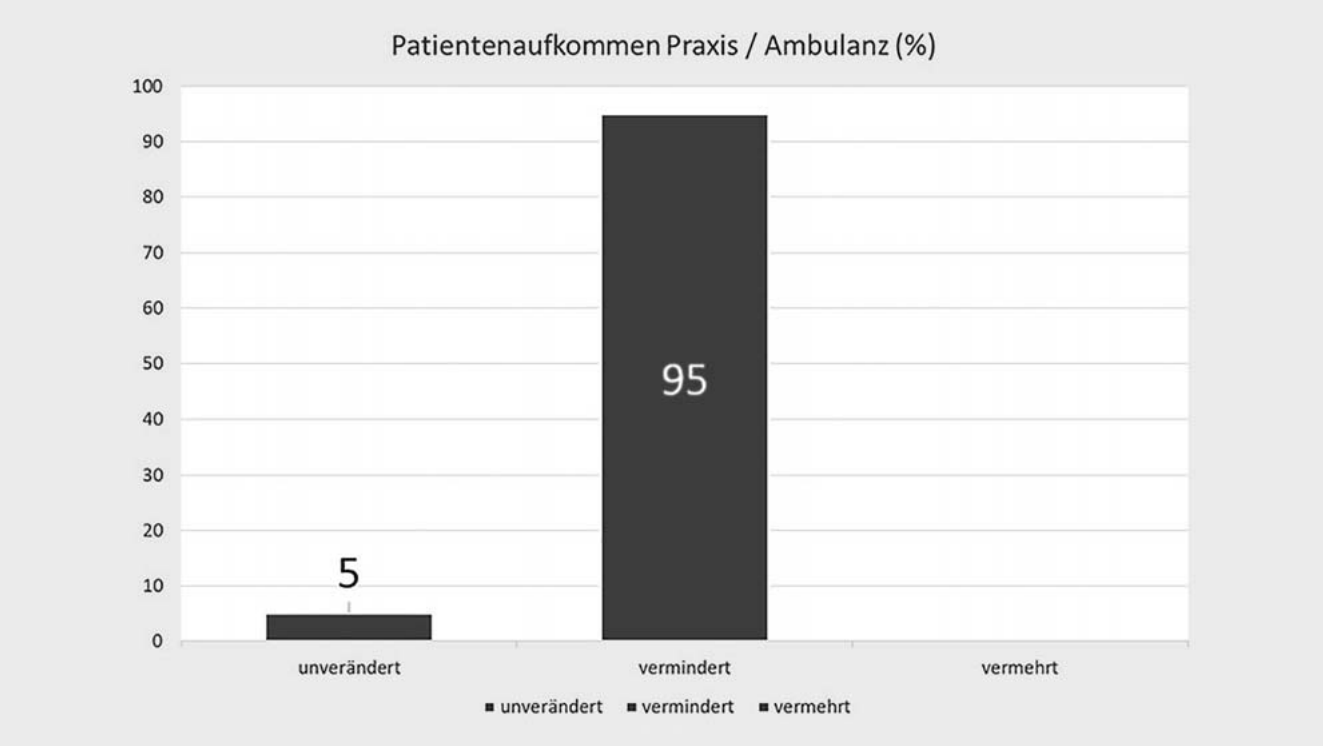

▶ **Fig. 1** Patient volume.

Spine Section

The German Spine Society (DWG) is a society of orthopaedic, trauma and neurosurgeons linking all physicians managing spinal disorders. Its main focus is the advancement of scientific activities, continuing medical education and quality assurance. Founded in 2018, the Spine Section complements the scientific society with professional political competence in close cooperation with the Professional Association of German Neurosurgeons (BDNC) and the Professional Association of Orthopedic and Trauma Surgeons (BVOU). The Section provides the interface for this and allows its members not only to develop activities for specific topics, but also to contribute specialist knowledge to the committees of the BDNC and BVOU. For this reason, the Spine Section was asked to investigate the far-reaching implications for professional policy. The questionnaire was consented by the BDNC and BVOU before being emailed to the members.

Statistical analysis

The survey was analysed by mean value calculations and standard deviations as well as Students' T-test for paired samples.

Results

The questionnaire took into account the responses during those weeks with massive changes in the utilisation and treatment management of hospitals and restrictions in outpatient care. In terms of employment, about one third of the responding physicians were fully self-employed and ran their own practice (30%). The majority of those surveyed (45%) worked part-time as staff physicians and also treated patients in a self-employed capacity. A quarter of the respondents solely worked as staff physicians (25%). Another quarter of those surveyed did not offer conservative care, while the vast majority (75%) practised both – conservative and operative surgery. 5% of respondents were solely active as conservative surgeons.

The question of working hours in the practice/outpatient clinic dealt with the ramifications of the COVID-19 pandemic on the organisation in the outpatient sector. As expected, working hours were reduced in almost two thirds of outpatient clinics (65%). A total of 30% of those surveyed reported no change in working hours. Surprisingly enough, 5% of respondents noted an increase in working hours.

Only 5% of practices/outpatient clinics reported no changes in patient volume. The vast majority (95%) experienced a decline in patient numbers (▶ **Fig. 1**). Patients often refrained from medical treatment of other diseases. For office appointments with the very select group of patients with spinal disorders, this manifested as a massive decline in patient referrals (▶ **Fig. 2**). As a result of these slumps, the affected physicians assessed their mean economic loss from outpatient activities at 42% reduction in revenue, with a standard deviation of ± 20%.

Due to the massive decline in patient contacts in the outpatient sector, the recruitment of spinal cases requiring surgery was inevitably less–even without the restrictions imposed by the authorities. 95% of respondents also reported lower numbers of operations. The mean reduction in the weekly number of opera-

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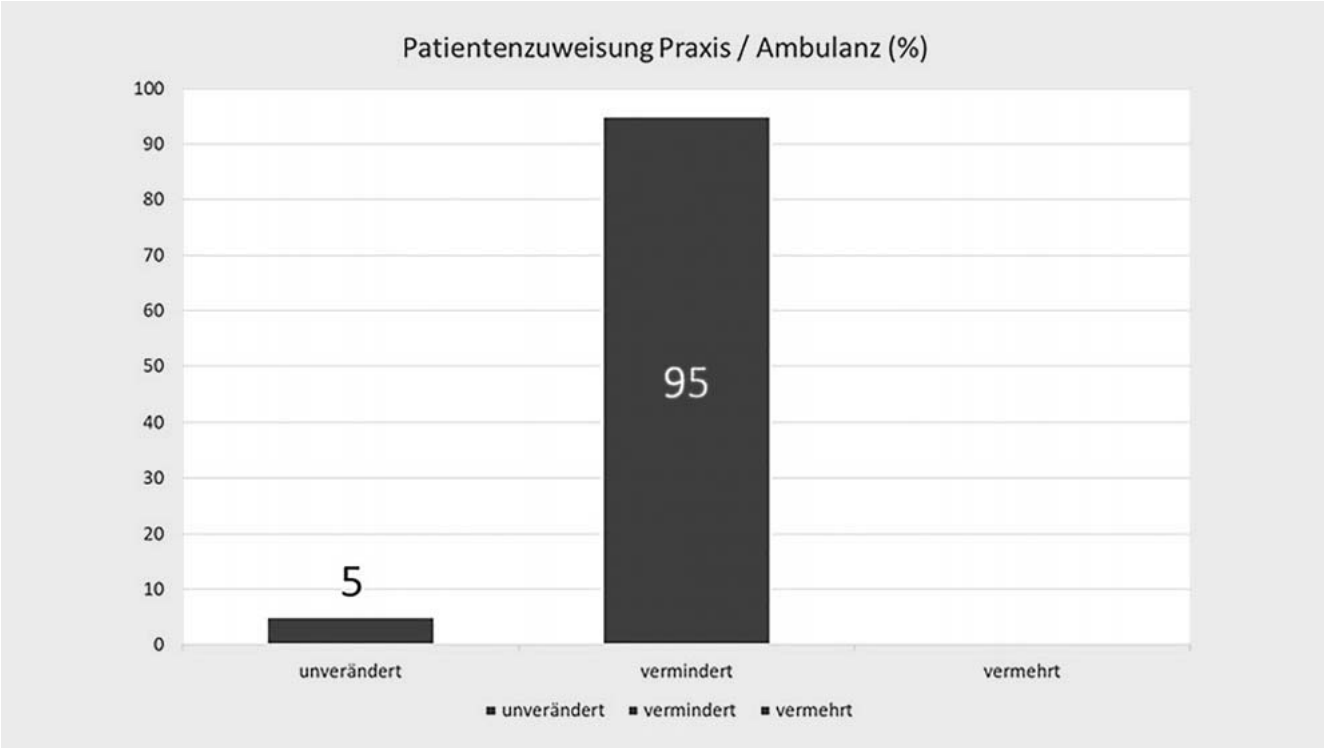

▶ **Fig. 2** Patient referral.

tions was − 36% ± 17%. Only 5% reported no change in their number of operations. The questionnaire also differentiated between elective/urgent and emergent surgery. The proportion of elective procedures was significantly reduced ($p < 0.01$) from approximately 78% ± 14% to 6% ± 1.8%. As expected, this increased the percentage of urgent and emergency procedures among the operations still being performed (▶ **Fig. 3**). Thus, during the period covered by the survey, the percentage of urgent operations accounted for more than half (52.3% ± 9.7%) and the number of emergent spinal operations for more than 40% ± 4.9%. During the restriction phase, the increase in the share of emergent and urgent operations as a percentage of the total number of operations was significant ($p < 0.01$). Due to the significant decline in surgical interventions, the mean reduction in revenue estimated by the majority of respondents was − 64% ± 21%. Three-quarters of those surveyed foresaw economic problems arising from the resulting restrictions in both inpatient and outpatient care, which, according to the data collected, were accompanied by significant losses in revenue. More than half of the physicians foresee moderate (20–40%) economic challenges, while 25% regard their economic circumstances as significant (> 50%) (▶ **Figs. 4** and **5**).

If the answers were also differentiated according to the type of employment, the expected economic losses among self-employed physicians were highest for the outpatient sector with 63% ± 12% and 72% for the inpatient sector. The lowest economic consequences were seen by those solely employed as staff members. Here, 15% ± 8% was expected in the outpatient sector and 18% ± 7% in the inpatient sector. When working both as a self-employed physician as well as staff member, losses in the outpatient sector were expected at 41% ± 8% and in the inpatient sector at 47% ± 14%. Despite the changes in the economic outlook, 90% of the institutions planned to avoid staff redundancies. However, a small number of respondents already had to let go some of their staff (5%).

Some personal information was also requested in the questionnaire. For example, 95% of respondents had not yet been infected personally with the SARS-CoV-2 virus. Nevertheless, three quarters of respondents reported a marked impact on their everyday working life due to the pandemic and the government reactions. For the remaining 25%, everyday life was only moderately affected by the pandemic. The wave of infection had left no one untouched.

At the end of the questionnaire, the respondents were asked to provide information on their personal and professional outlook. Half of the respondents expected no change in the future. However, 40% looked to the future with negative expectations. But 10% expected positive developments arising from the pandemic.

Discussion

A crisis that massively intervenes in daily life and professional activities inevitably leads to changes in everyday personal life and possibly to uncertainty regarding one's own professional and economic outlook. Healthcare systems in industrialised countries no longer only treat life threatening diseases. One important aspect is also the preservation and improvement of the quality of life of its citizens. Today, this sector accounts for the greater part of

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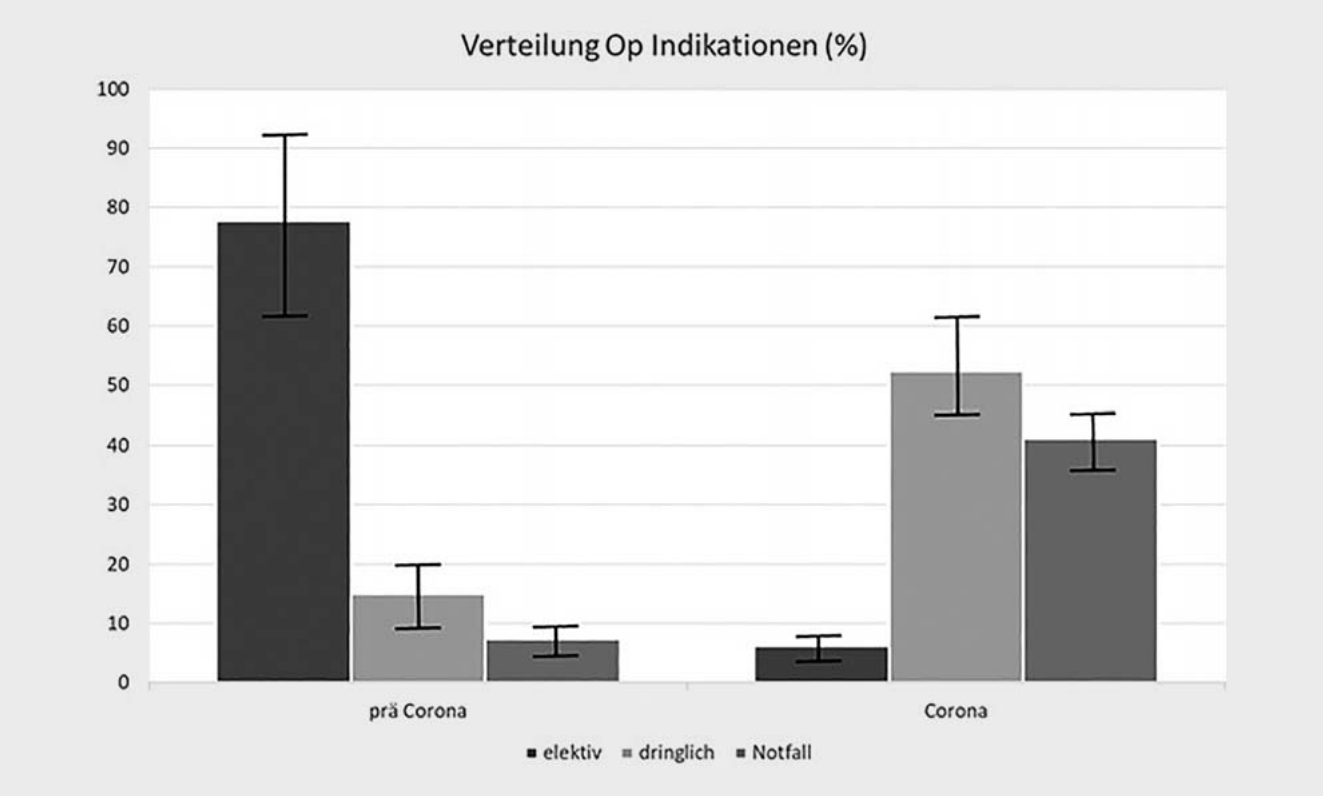
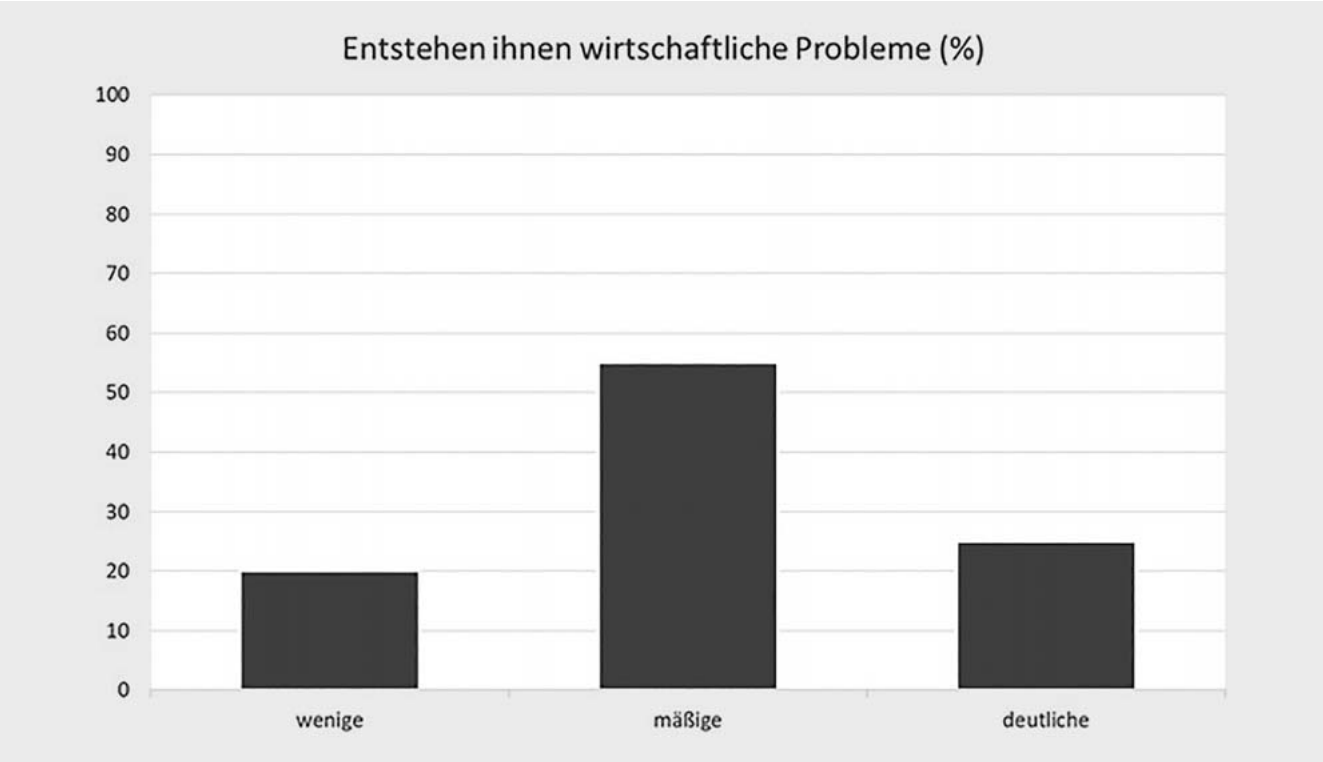


▶ **Fig. 3** Changes in the indication for surgery.



▶ **Fig. 4** General economic outlook.

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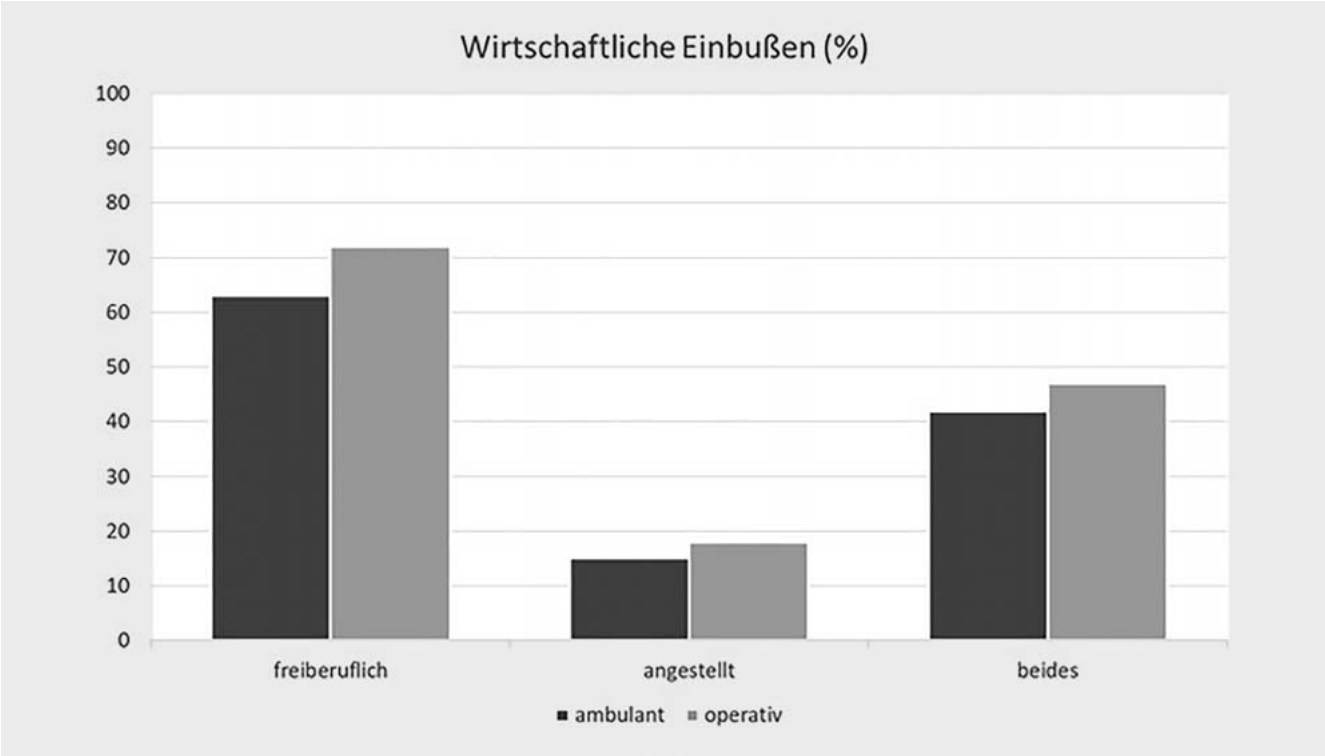

▶ **Fig. 5** Expected economic losses.

medical care in Germany. With the spread of COVID-19 and its massive need for intensive care capacity, the German healthcare system had to undergo radical changes in a very short time. The present infrastructure was focused on a single clinical entity, while the rest of the system was switched to emergency operation. Indications for therapy had to be rethought. Symptoms that „only" limited the quality of life were regarded as secondary [5]. In many cases, patients had to learn, for example, that sciatica refractory to conservative management was assessed as not requiring surgery. Physicians were told to differentiate elective from urgent cases, a type of triage in the broadest sense. In those European regions much more severely affected by higher case load in the pandemic, this emergency care of patients with spinal disorders worked surprisingly well [6].

Due to the short lead time and the extent of the restrictions, many healthcare professionals were unable to prepare themselves adequately. In German hospitals, this led not only to an exceptional vacancy rate but also, with the lack of personal protective equipment etc., to confusion of how to deal with staff and patients. The answers to the survey demonstrated this massive decline in the number of outpatient and operative cases, thus showing that practices, outpatient clinics and hospitals had implemented the reduction in services mandated by the health authorities. At the same time, respondents also expected a marked decline in revenue as a result of this reduction in services. This will have an economic impact on the institutions. As a result, a substantial number of those surveyed were looking to the future with concern.

A substantial part of the questionnaire dealt with the personal and economic outlook of the respondents. A second survey after the COVID-19 pandemic is planned to establish retrospectively to what extent these expectations actually do materialise. However, it can already be stated at this point that those managing patients with spinal disorders are experiencing a massive collateral impact of the COVID-19 pandemic. Other medical specialties, such as cardiology, have already issued statements in this regard [7]. The future will largely depend on what lessons will be learned from the COVID-19 pandemic. Although orthopaedics, trauma surgery and neurosurgery are, for the most part,not directly involved in the treatment of patients infected with SARS-CoV-2, it is the responsibility of the attending physicians to protect their patients. The collateral impact of the pandemic on orthopaedics and trauma surgery as well as neurosurgery has already been discussed in detail [8, 9]. Other spinal surgery specialities in Latin America have referred to existing solutions, such as telemedicine, that have been examined in this study [10]. This survey by the Spine Section provides an overview of outpatient, day-patient and inpatient care institutions for spinal disorders. Similar initiatives have been published in the USA a few days ago [11].

The survey and its results presented here should be interpreted in light of the present limitations. The number of members responding to the „Spine Section" (N = 91) would appear to be rather small. However, the „Spine Section" primarily comprises self-employed colleagues in private practice responsible for treating patients with spinal disorders. Therefore only this panel was surveyed. Furthermore, the survey results are directly related to

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the survey period and must be assessed accordingly. The rapid development of the pandemic and the corresponding political developments must also be taken into account. A new survey with the same panel at a later point in time would allow more accurate conclusions to be drawn regarding the impact on the treatment of spinal disorders.

In summary, it is hoped that the COVID-19 pandemic will have shown everyone that health is a precious, but not guaranteed, commodity, and that in a complex health and social system monosymptomatic approaches focusing on the pandemic will result in significant changes in supply and demand.

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Conflict of Interest

The authors declare that they have no conflict of interest.

References

[1] tagesschau.de. Erster Coronavirus-Fall in Deutschland. Online (last access: 31.07.2020): https://www.tagesschau.de/inland/coronavirus-deutschland-erster-fall-101.html

[2] Robert Koch-Institut. Situationsbericht vom 27.3.2020. Online (last access: 31.07.2020): https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-03-27-de.html

[3] Euro WHO. WHO erklärt COVID-19-Ausbruch zur Pandemie. Online (last access: 31.07.2020): http://www.euro.who.int/de/health-topics/health-emergencies/coronavirus-covid-19

[4] Bundesgesetzblatt. Gesetz zum Schutz der Bevölkerung bei einer epidemischen Lage von nationaler Tragweite, vom 27. März 2020. Bundesgesetzblatt Jahrgang 2020 Teil I Nr. 14. Online (last access: 31.07.2020): https://www.bgbl.de/xaver/bgbl/start.xav?startbk=Bundesanzeiger_BGBl&start=//*[@attr_id=%27bgbl120s0587.pdf%27]#__bgbl__%2F%2F*%5B%40attr_id%3D%27bgbl120s0587.pdf%27%5D__1596193361517

[5] Mehta AI, Chiu RG. COVID-19 Nonessential Surgery Restrictions and Spine Surgery: A German Experience. Spine (Phila Pa 1976) 2020; 45: 942–943. doi:10.1097/BRS.0000000000003571

[6] Meyer M, Prost S, Farah K et al. Spine Surgical Procedures During Coronavirus Disease 2019 Pandemic: Is It Still Possible to Take Care of Patients? Results of an Observational Study in the First Month of Confinement. Asian Spine J 2020; 14: 336–340. doi:10.31616/asj.2020.0197

[7] Kansagra AP, Goyal MS, Hamilton S et al. Collateral Effect of Covid-19 on Stroke Evaluation in the United States. N Engl J Med 2020; 383: 400–401. doi:10.1056/NEJMc2014816

[8] Haffer H, Schömig F, Rickert M et al. Impact of the COVID-19 Pandemic on Orthopaedic and Trauma Surgery in University Hospitals in Germany. J Bone Joint Surg Am 2020. doi:10.2106/JBJS.20.00756

[9] Hecht N, Wessels L, Werft F–O et al. Need for ensuring care for neuroemergencies-lessons learned from the COVID-19 pandemic. Acta Neurochir (Wien) 2020; 162: 1795–1801. doi:10.1007/s00701-020-04437-z

[10] Soriano Sánchez JA, Perilla Cepeda TA, Zenteno M et al. Early Report on the Impact of COVID-19 Outbreak in Neurosurgical Practice Among Members of the Latin American Federation of Neurosurgical Societies. World Neurosurg 2020; 140: e195–e202. doi:10.1016/j.wneu.2020.04.226

[11] Louie PK, Harada GK, McCarthy MH et al. The Global Spine Community and COVID-19: Divided or United? Spine (Phila Pa 1976) 2020; 45: E754–E757. doi:10.1097/BRS.0000000000003560

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