

Support for global health and pandemic preparedness in medical education in Germany: Students as change agents

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Abstract

The COVID-19 pandemic has reinforced Germany's role as global health player, but the education system is lagging behind and does not adequately prepare health professionals for the new challenges. This study aims to strengthen global health in undergraduate medical education in Germany. Major objectives include: to review the current situation, explore changing demand for global health and introduce innovative teaching models and the drivers for change. Mixed methods and an explorative approach were applied, comprising a scoping review, online surveys carried out at Hannover Medical School, March/April 2020. Target groups were undergraduate medical students ($n = 384$) and additionally lecturers ($n = 172$), and finally new multiprofessional teaching courses initiated by students and developed collaboratively. The results reveal only slow pace of change on the level of the education system, while demand for global health education has increased markedly in all actor groups, but strongest in the group of students in the preclinical phase. Implementation of global health programmes illustrates how students can

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become change agents and enhance institutional innovation bottom-up. However, in order to achieve wider transformative potential, these efforts must be flanked by macro-level policy changes and integrated in future pandemic preparedness strategies.

KEYWORDS

COVID-19 pandemic, Germany, global health, medical education, pandemic preparedness

1 | INTRODUCTION

Across countries, the COVID-19 pandemic has put global health in the spotlight and created a new need for health professional education. Germany is a particularly interesting case, because global health issues became visible in different areas, as epidemiological and as political challenges, and this combination reinforced pressures for change. As a public health emergency, the COVID-19 crisis highlighted a need for better pandemic preparedness and for European and global collaboration,^{1,2} while at the same time shifts in global power relationships happened which called for a new global health policy agenda in Germany.³ Over recent years, the country has become an important player in global health and has taken over new international responsibilities, including significantly increased financial contributions to WHO.^{4,5} Germany is also facing new global expectations in relation to leadership for better governance and solidarity,⁶ reinforced through the German European Union (EU) Council presidency in the second half of 2020.⁷

However, the education system does not keep pace with the new political and epidemiological demand for global health. Global health is still marginal in Germany's medical education.^{8,9} The picture is only slightly more positive in public health, but worse in other health professions. Thus, the health workforce is poorly prepared for new challenges, and this also impacts in policy expertise. The problem has been addressed for several years¹⁰ and medical students have called most loudly for change.¹¹⁻¹⁴ The problem is not limited to Germany, however. A call to action for strengthening global health education is echoed in the international literature.¹⁵⁻¹⁷

The COVID-19 crisis now made the problems more visible and action more urgent, the so-called 'focal glass' effect. There is growing awareness that global health education must be strengthened, but it is not understood well how to make this happen. This raises questions on the opportunities for translating new demand for global health education and bottom-up change into institutional innovation, thus directing our attention towards implementation and actors in global health education. There is no common definition of global health¹⁸ but an increasingly broader scope of topics.¹⁴ We think of global health not as a checklist of new competences, but as a complex approach that connects global thinking and local action, aiming to support the United Nations Sustainable Development Goals (SDGs)¹⁹ and to reduce social inequalities and environmental/climatic risks. Viewed through this lens, support for global health needs complex changes that stretch far beyond the education system.

The present study aims to contribute to the strengthening of global health in health professional education by interlinking research and implementation of new teaching models. We focus on undergraduate medical education in Germany and on students as active players and 'change agents' in global health education. More specifically the study seeks to clarify three major questions: Where are we now in addressing global health in Germany's medical education? What do students and lecturers demand, and how does COVID-19 impact demand and perceptions on global health education? Finally, how can global health in medical education be strengthened more effectively, and what lessons to be learned?

2 | METHODS

A qualitative exploratory approach was applied which connects research and practice with a view on implementation. The study uses mixed methods and draws on material from different sources, including ongoing teaching projects.

First, a scoping review²⁰ was undertaken, based on a pubmed search and additional hand search including documents, as well as expert information. The search strategy was focussed on global health in medical education in Germany, aiming to clarify our first research question: 'where are we now?'. We first searched pubmed using 'global health, medical education, Germany' as terms, including work published 2000 onwards (until end of November 2020). This was complemented by a handsearch and by expert information (from two major academic networks in the field). The format of the publications was not limited (e.g., including research and comments), but the substance was narrowly defined by our research question (excluding, e.g., clinical guidelines addressing a global health theme, international partnerships). Based on the selection and discussion of two researchers, 19 references were included in the full text analysis (see Figure S1). Additionally, background information was considered including findings from other countries and more general suggestions from the Lancet Commission on health professional development for the future.¹⁶

Furthermore, qualitative assessment of the national regulatory framework for medical undergraduate education (*Nationaler kompetenzbasierter Lernzielkatalog Medizin, NKLM*) was undertaken.²¹ This national competency-based learning objective catalogue builds the foundation of topics taught at German medical universities and is therefore a key document in medical curriculum assessment. Relevant medical and public health competency frameworks were reviewed to select categories for the assessment: the framework for interprofessional global health competencies based on a consortium of US universities,²² the Bellagio Global Health Education Initiative,²³ and the most recent public health competency framework of WHO and the Association of Schools of Public Health in the European Region.²⁴ Seven categories have been selected which provide a matrix for the assessment (Table 1).

Second, we use material from an online survey carried out in March/April 2020 at Hanover Medical School, Germany, on the topic 'Learning from SARS-CoV-2, strengthening global health in education' (in German). The target group were undergraduate medical students. Drawing on an established evaluation system for teaching, material was gathered prior to the start of the new term, at a time when the pandemic was peaking in Germany and uncertainty was very high. A written questionnaire was developed, comprising standardised items and free-text items (available in German).²⁵ Ethical approval was obtained and an invitation email sent to all undergraduate medical students at Hanover Medical School ($N = 2057$). A total of 409 undergraduate medical students participated in the survey (response rate 20%) and $n = 384$ valid responses were included in the analysis (73% female, 26% male and 1% others).

TABLE 1 Global health issues in the national regulatory catalogue

Global health issues and related NKLM ^a goals
Infectious diseases, travel medicine, antimicrobial resistance; 4 related goals (19.1.1.1, 19.2.1.3, 19.2.1.4, 19.2.1.5)
Prevention and health promotion; 3 related goals (19.1.2.1, 19.1.3.1, 19.1.8.1)
Epidemiology; 1 related goal (19.1.9.2)
Health systems and regulatory frameworks of healthcare delivery; 2 related goals (19.1.8.2, 10.1.1.1)
Social determinants of health and lifestyle factors; 4 related goals (12.20, 12.20.2.2, 19.1.4.1, 19.1.1.2)
Interprofessional cooperation; 3 related goals (19.2.9.2, 8.4.2.2, 11.4.2.3)
Ethics and treatment of vulnerable groups; 3 related goals (18.4.3.1, 11.4.3.6, 18.5.5.2)

Source: NKLM, 2015 (most recent version), authors' own assessment

^aCorresponding numbers are provided in brackets for those familiar with the NKLM.

Descriptive statistical analysis was undertaken for the standardised items; free-text information was analysed through qualitative content analysis using an inductive approach.²⁶ For the purpose of this article, we have selected six standardised items of the questionnaire, primarily five-point likert-scales, and two open questions. Main topics included: students' assessment of global health in the current curricula, demand for global health in future education, the impact of the COVID-19 pandemic on demand for global health education, and additionally, more generally medical students' perceptions of the COVID-19 risks.

Additional material was included from a rapid online survey with lecturers at Hanover Medical School carried out end of March 2020 on the same topic and through the same online platform as used for the student survey.²⁵ In the group of lecturers, $n = 172$ valid responses (45% female, 51% male, 4% no answer) were included; a reliable response rate could not be calculated for this group, because the invitation had to be sent to all healthcare academics. We selected three standardised items related to global health issues from the questionnaire (primarily five-point likert-scales).

Third, we introduce new global health courses which have been developed and accredited between spring term 2019 and autumn term 2020 at Hanover Medical School.^{25,27,28} The courses are explored in relation to the substance and the actors and implementation processes.³⁰

3 | RESULTS

3.1 | Where are we now? Discourse, strategies and regulatory frameworks

The literature highlights several gaps and weaknesses in medical global health education in relation to both availability and substance of the courses. An assessment of all 36 publicly funded medical faculties in Germany between 2010 and 2014 revealed that global health research was highly concentrated in a few institutions and only little global health education exists.⁸ Similar conclusions were drawn from a survey of medical schools, which found global health activities only at approximately one third of all medical schools (13 out of 38 schools).²⁹ Participants in this survey judged global health education as insufficient (92%) and identified lack of institutional structures and low priority of global health at the levels of faculties and academic management as major barriers.²⁹

The online survey of medical students added further evidence of poorly developed global health education. According to this survey, demand for global health in medical education was very high; 94% of the students participating in the study supported the idea to introduce global health in the curriculum.^{12,13} The results revealed that a relevant proportion of medical students aimed for international work experience, but universities did not prepare for this. Nearly 90% of final year medical students had not participated in a global health course and 73% had not completed a course in tropical medicine.¹³ Available research does not cover more recent developments and the new challenges arising from the COVID-19 pandemic, however.

Attention to global health education was increasing in the medical and public health groups, but the changing substance of global health and the new challenges were not adequately reflected.³⁰ The dominant discourse in Germany showed two major limitations. First, global health was merged with public health without appropriate attention to the specific conditions and needs of the two fields. This not only applies to statements from the realm of public health³¹ and from physicians in the public health sector,³² but also to the German National Academy of Sciences (Leopoldina)³³ and to a Lancet³⁴ comment. Second, global health was discussed in relation to cultural competences, while a health system approach remained poorly developed.³⁵ A further challenge was to distinguish 'internationalisation' of education more clearly from global health education.³⁶

More complex and critical approaches on global health are currently marginal in a mainstream discourse of health professional (medical) education, but some authors have highlighted the need for multi-disciplinary teaching

models and a broader scope of topics.^{10,37–41} Bozorgmehr^{18,38} introduced an analytical framework for global health education, which expands on the social determinants of health. Most recently, Schuster et al.⁹ suggested a framework which is based on a Canadian model comprising five major dimensions: security, technical, entrepreneurial, humanitarian and social justice approaches.⁴² This framework informed the development of global health programmes in medical education at Charité University Berlin.⁹

It is important to note that most complex suggestions for strengthening global health in medical education have been introduced, at first and foremost, by the national medical student association and their various representatives over time.^{11–13,17,18,27,28,43–46} These authors have identified a wide range of topics and challenges relevant to global health education, including a health systems approach and the social determinants of health, among others.^{46,47} To this end, developments in global health education seem to mirror wider societal movements strongly driven by young people, most prominently known from climate change activism. Authors from the networks of medical students and early career professionals also directed attention to the implementation of global health education and the importance of actor networks.⁴⁵

Since recently, the call for global health in medical education is gaining currency, backed up by a number of political and academic events in the field of global health in Germany, in particular the Global Health Summit, the EU Council Presidency and finally a new Global Health Strategy recently launched by the Government.^{2,3,7} However, education often remains marginal on the health political stage and activities are limited to few universities and networks.^{9,27,43} Importantly, policy incentives for global health education also lack adequate coordination across the Health and Education Ministries.

In relation to the regulation of global health education in medicine, our assessment of the national catalogue²¹ revealed some opportunity for addressing global health issues, yet the scope of themes remains very limited. Important topics are missing, such as climate change and a 'one health' or 'planetary health' concept.³⁹ The current framework also does not adequately consider pandemics and health emergencies. Systematic reflection of the lessons learned from the COVID-19 crisis has still to come. A revised version of the national catalogue is in progress and, according to expert information, it is planned to expand on global health issues. Table 1 provides an overview of major themes related to global health issues.

3.2 | What do we need? Demand for global health in medical education and the impact of COVID-19

The results from the students' survey revealed that the proportion of global health education in the curriculum was judged as very low (mean value of 4,1, five-point likert-scale) and only half of the participants (49%) were taught global health topics. When asked about their interest in global health, 48% of the students stated high interest even before the COVID-19 pandemic and 62% thought the pandemic had increased their interest; no relevant differences were found in relation to gender. Strong demand for global health education in the medical curriculum could be identified for all education years (88%), but this was strongest in the youngest cohort, the students in the preclinical phase. In the preclinical group, 93% of students agreed that global health should be a higher proportion of the medical curriculum, while only 77% of students in their final year of medical education found this to be true. Notably, demand for global health included a broad range of topics, for instance medical issues like immunisation and tropical diseases, as well as knowledge into health systems and policy, climate and environmental health (Figure 1).

Qualitative material from the free-text responses provided in-depth information into students' perceptions of the effects of COVID-19 in relation to global health and the medical curriculum. The findings revealed a strong commitment to global health issues and critical reflection on the threats of the pandemic. For instance, several students recalled the need to take action against climate change and were concerned that COVID-19 weakens the activities. Other comments were concerned about the impact of COVID-19 in low- and middle-income countries,

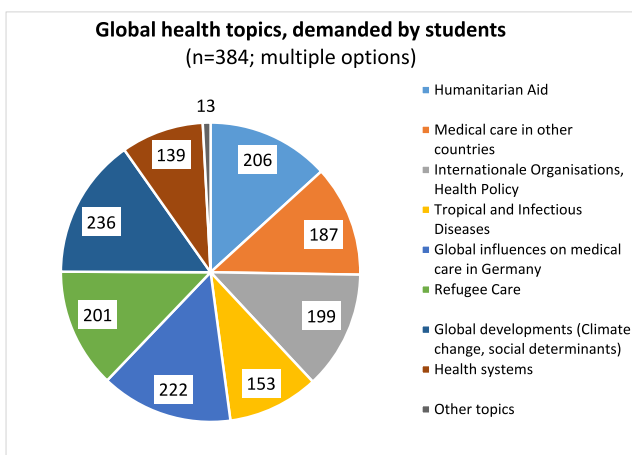


FIGURE 1 Global health topics, demanded by students, 2020. *Source:* authors' own data and calculation

especially in the global South. The following quote illustrates a wide range of issues that students felt worried about.

Situation of people without health insurance especially people without papers; weakening democracy; weakening human rights; situation of people living in economically weak and politically unstable countries; loneliness and mental illness of people in single households; lack of attention and resources to fight climate change; increase in domestic violence. (#1)

When asked about the medical curricula in the aftermath of the pandemic, many comments were related to lessons learned from COVID-19 and a need for better pandemic preparedness.

[T]o integrate pandemic plans into the curricula, especially in courses like public health ... The topic of global health should be taken into perspective (which diseases exist in which countries; how can they spread; how are the individual health systems prepared for this?). (#2)

Critical discussion of global health topics [and] relationship between the political situation and the health/medical system. (#3)

Disciplines like global health, as well as epidemiology and public health are not included or under-represented. Also, there is sadly nothing in the programme on the causes or the management of pandemics. (#4)

In the group of lecturers, 71% of the participants in the survey said that COVID-19 increased the relevance of global health in their daily practice 'strongly' or 'very strongly', and 30% were planning to integrate global health topics in future teaching. When asked about organisational support to improve global health education, the vast majority would welcome some support by the university, which may include structural changes (e.g., further education) as well as individual support tools, like for instance, the provision of teaching materials, or advanced training opportunities (Figure 2).

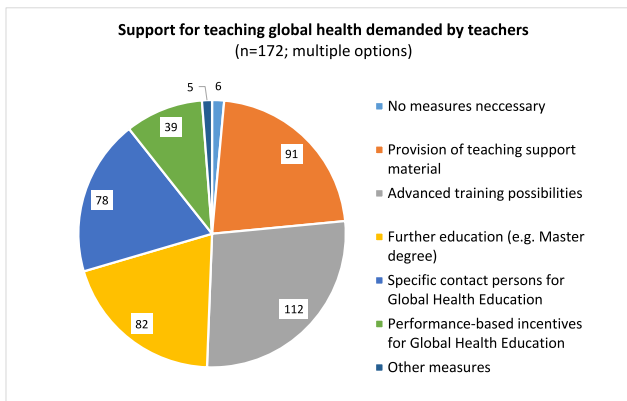


FIGURE 2 Support for teaching global health demanded by teachers, 2020. *Source:* authors' own data and calculation

3.3 | How to proceed? Best-practice examples of innovative teaching projects and implementation processes

An elective programme introduced in September 2019 in the undergraduate medical curriculum at Hanover Medical School serves to illustrate the tools and substance of the model, the actors involved and the implementation strategy. The new global health course utilised a window of opportunity in the curriculum, which includes a small number of mandatory elective seminars. The Sustainable Development Goals (SDGs) of the United Nations¹⁹ served as an analytical framework of the course.

The teaching model builds on five major pillars:

- > medical students as initiator, collaboration between students and the programme coordinator, participatory curriculum development
- > the SDGs as framework and guidance of the curriculum
- > a multiprofessional and trans-sectoral teaching team, cooperation between public health and different medical clinics/departments
- > team teaching of student and staff coordinator, collaboration with NGOs
- > strong networks through collaboration with the national German medical students' association, GandHI bvm^[11,27]

The course is structured along the SDGs,¹⁹ whereas the WHO Fact Sheets on health targets⁴⁸ provide further practical guidance. One important element of the course is the combination of more generic topics and theoretical approaches—including information on the different types of health systems, on international organisations and major funding sources of global health, global health policy, and Germany's role as global health player—and specific themes and practical examples. The latter ones are provided by guest lecturers from different medical disciplines, microbiology and political science, including five major themes:

- > Maternity care and child health, examples from sub-Saharan Africa
- > Neglected tropical diseases, including a range of practical illustrations
- > Migration and care for asylum seekers, practical experience with organising a local auxiliary camp during the 2015 European refugee crisis

- > International independent humanitarian organisations, Medicine sans Frontières, experiences from the Ebola outbreak and coordination of humanitarian aid in the Democratic Republic of Congo
- > Global health policy and Germany's EU Council Presidency in 2020

In relation to the teaching approach, a participatory interactive learning model and a workshop-style course with a small number of participants (between 10 to maximum 20) are key conditions. A mix of lectures and workshops with short presentation by students and collaborative problem solving (e.g., organisation of a refugee camp) ensures the development of skills and knowledge in different areas of global health. The course is furthermore characterised through a strong networking approach. This applies to local collaborations within the Medical School and the region, as well as nationally with the medical students' association and other global health networks, and to participation in European scientific networks.

Following overall successful experience with the new course, action was taken by the university and a project was launched to improve institutional and financial support for global health in the medical curriculum. A new global health course is currently running for preclinical semesters (from October 2020 to February 2021). This course follows a different concept. It was developed and launched by a national students' initiative, notably voluntarily and without institutional support. Structured by 12 weekly one hour lectures, the themes cover a wide range of global health issues, for example, pandemic realities in Kenya and Germany, reproductive rights, stakeholders, careers in global health, migration, mental health, decolonise global health and communication.²⁷ The national online course has subsequently been accredited at Hanover Medical School (among a few other universities) and integrated in the curriculum. For this purpose, an on-site (as far as possible with the COVID-19 restrictions) introduction lecture and a final reflection seminar were added; written assessment is defined and supervised locally by the university.²⁵

A further novelty relates to the science module at Hanover Medical School. Global health will be part of an e-portfolio in the setting of the science module, to be introduced in early 2021.²⁵

4 | DISCUSSION

Efforts towards strengthening global health have been underway in Germany for about a decade and they were primarily driven by medical students. However, the findings from the literature reveal persisting gaps and weaknesses in medical global health education, thus medical students are poorly prepared to respond to new global health challenges. Our empirical material provides further information and highlights that demand for global health themes is much higher than the currently offered teaching programmes. Notably, the gap is strongest in the youngest group of students. The qualitative material offers further insights into the substance of global health education and into students' perceptions of the effects of the COVID-19 pandemic. The findings suggest a need for improving preparedness for a pandemic, for strengthening information on public health themes and including global health in the medical curriculum.

Our practice models illustrate innovation and capacity building for global health in the medical curriculum.²⁷ The current version of the regulatory catalogue for the medical curriculum²¹ does not adequately reflect global health education needs, but it provides opportunity for individual lecturers and courses to expand on global health. Findings from our survey suggest that interest in global health education is improving among lecturers, yet there are little signs for systematic incentives and support by universities. The literature and the network activities^{9,43,44} provide some information on innovation and change on the macro-level, but health policy rarely thinks of education and of the human resources for health. A most recent example is the new global health strategy of the Government.³ Despite active involvement of the students' association in the consultation processes⁴⁷ and their strong demand for global health inclusion in the medical curriculum, this has not been considered in the new document.

However, students can play an important role in raising awareness and in supporting frontline innovation, such as the implementation of global health teaching models at the meso- and micro-levels of organisations. Strengthening the voice of students as the next generation health professionals can help us to develop participatory teaching models and to support the establishment of global health in health professional education in Germany. Similar findings were reported from the United States.⁴⁹ Added to this, changing attitudes and experiences in the group of students shape the academic socialisation, which will most likely produce change in future professional practice.

In order to achieve wider transformative potential, these efforts must be linked to political support on the macro-level, however. As highlighted some years ago by the Lancet Commission, it is a systemic problem if the health professionals are poorly prepared for the new challenges of the future.¹⁶ The problem still persists, and it is not limited to Germany. For instance, authors from the Netherlands recently highlighted a need for improving global health in medical education and called upon their government to take action.¹⁷

In Germany, some progress can be observed. However global health education in medicine might flourish within emergent 'bubbles', while the majority of German universities responsible for medical and healthcare education lack both expertise and funding to establish adequate global health programmes. There is a need for comprehensive and systematic programmes for global health education in medicine and in the entire health professional workforce. This would need much more serious efforts and larger funding programmes which connect research and education. The experiences from establishing public health in Germany in the 1980 and 1990s, and more recently the programme for strengthening primary healthcare as an academic discipline, may provide some helpful guidance. They also make it clear that change at a few universities and in a few areas remain piecemeal work, at best, as long as no governance framework and leadership exist at the political level.

Change at the system level is therefore important. There is an urgent need to overcome the deeply entrenched 'silos' in both politics and professional groups. In relation to the health professions, the 'tribalism' (each profession fights for their own interest in a hierarchical order) has been identified since long as major obstacle for change.¹⁶ Global health education calls for multi-disciplinary approaches. Similarly, support for global health policy and pandemic preparedness need coordination and trans-sectoral governance, in particular better coordination between the healthcare and the education systems,⁵⁰ but regulatory power and governance arrangements are fragmented and characterised through silo politics. It is important to understand that strengthening global health needs integrated approaches and governance innovation on all levels.

4.1 | Limitations of the study

This study was able to identify some factors that may impact in global health education and support innovation, but a number of limitations must be considered. The material was limited to the situation in Germany and to the medical profession and undergraduate education. The study was explorative in nature and used findings from one medical school. The survey material was gathered at a specific point in time, namely during the first weeks of the pandemic, when uncertainty was very high. The surveys were carried out ad hoc to gather unique information on the effects of a pandemic using an available online platform. On this backdrop, the response was satisfactory; for instance, a comparable survey carried out with students at 33 medical schools in the United Kingdom achieved lower responses per university.⁵¹ However, access through the teaching platform may have limited the response rate and there may also be bias in the sample, as those who were more interested in global health might have responded more often to the survey. The response rate was higher in the group of women compared to men, thus mirroring a usually higher willingness of women to participate in surveys. However, there were no signs of a systematic bias in the answers, because no important gender differences were found. In relation to the teaching courses, we referred to ongoing processes; an evaluation will be carried out at the end of term and results were therefore not available at the time of writing. Furthermore, sustainability cannot be predicted, although there is now some experience with global health courses.

5 | CONCLUSION

The present study set out to contribute to the strengthening of global health in medical education by connecting research and implementation. We used Germany as a case study and suggested to move beyond a mere education approach in order to understand the underlying systemic challenges. The results showed that strengthening the voice of students as the next generation health professionals and developing participatory teaching models can enhance innovation in the medical curriculum. A better understanding of the capacity of students to drive change towards global health is therefore important. At the same time, the developments in German medical education over recent years clearly illustrated the limitations of bottom-up action, which may not achieve transformative power on the level of institutions. There is a need for both appropriate funding and comprehensive governance innovation to align health and education institutions, research and education, policy and practice, and students and lecturers.⁵²

Our case study also highlights that new health policies and global political responsibility do not adequately translate into innovation in the education system. There are some signs that the COVID-19 pandemic may improve sensitivity for global health issues and thereby open new windows of opportunity for global health education. However, the importance of human resources for health and a competent health workforce is still not adequately acknowledged in health policy and pandemic preparedness plans. Strengthening global health in health professional education must become an important dimension of health workforce preparedness and part of wider strategic action towards pandemic preparedness.

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CONFLICT OF INTEREST

No conflict of interest declared.

ETHICS STATEMENT

Ethical approval for the survey was obtained by the Ethics Committee of Hannover Medical School (8999_BO_K_2020; March 2020).

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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