



Orthopaedic training during COVID-19 pandemic: should action be taken?

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Since COVID-19 was declared a pandemic in March 2020, drastic changes have affected all aspects of life [1]. Education was not far apart from the dynamic situation, particularly orthopaedic residency, and fellowship training. While medical specialties were the workhorse of the medical service, orthopaedic surgery and other surgical subspecialties were pushed aside. Twenty-five to fifty percent of orthopaedic trainees were redeployed to medical and ICU services and recruited as frontline responders [2, 3]. For those who remained in orthopaedic services, the workload was reduced, or trainees worked in alternate teams with a specific period on-duty followed by a certain period in isolation or off-duty [3, 4]. The operating time spent by trainees for trauma and elective surgeries and the clinic was significantly reduced [5, 6]. In the UK, the authorities urged the consultants to be the first surgeons in surgeries that otherwise a trainee can do to decrease the operative time [7]. The pandemic even changed the practice in some regions of the world where trauma cases that were typically managed surgically were treated conservatively [8]. Although the pattern of loss of training opportunities was not uniform globally [3], we assume that all world regions were affected to some extent.

To provide an updated evaluation of the effect of the COVID-19 pandemic on orthopaedic training worldwide, we conducted a concise 6-questions survey. It involved a single choice answer to questions including nationality, professionalism, personal opinion of the level of affection, any actions, or modifications from the notational body responsible for training, and finally, subjective opinion about the negative drawback on developing competent future consultants. The survey was accomplished under the umbrella

of the International Society of Orthopaedics Surgery and Traumatology (SICOT) and sent to orthopaedic surgeons worldwide in the email database of the headquarter, mostly to the SICOT members.

We received 240 responses from the 22nd of November till the 6th of December 2021. Ten responses were excluded because of repetition or inconsistent answers. Finally, answers from 230 orthopaedic surgeons from 76 different nations representing the six continents were included and analyzed (Fig. 1). We categorized the respondents according to professionalism into four groups; surgeons involved in training supervision, either a university staff member or staff in an educational hospital, surgeons not involved in any training program, and trainees. Seventy percent of the replies were from surgeons involved in different training programs supervision worldwide (Fig. 2).

Seventy-eight percent of the respondents agreed that the COVID-19 pandemic had a moderate to high effect on the current training programs (Fig. 3a). A funnel-shaped diagram analysis of different groups showed similar views distribution with the majority voting for the moderate, followed by high affection. Trainees were the most pessimistic, with none voting for the “very low” affection, unlike the other three groups (Fig. 3b). Fifty-nine percent reported no action from their national training body to counteract the situation (Fig. 4). Few reported extensions of the training program period, while many mentioned shifting to digitalization and telecommunication for education. Almost half of the respondents were pessimistic and agreed that this situation would affect the development of competent orthopaedic surgeons in the future. Only 19% think that trainees will be capable of catching up and upgrading their knowledge (Fig. 5a). Again, the funnel-shaped diagram showed a comparable sights distribution between the different groups, revealing a global agreement and sending a clear message about frightening worries from the effect of this pandemic on the future orthopaedic surgeons’ capability and competency (Fig. 5b).

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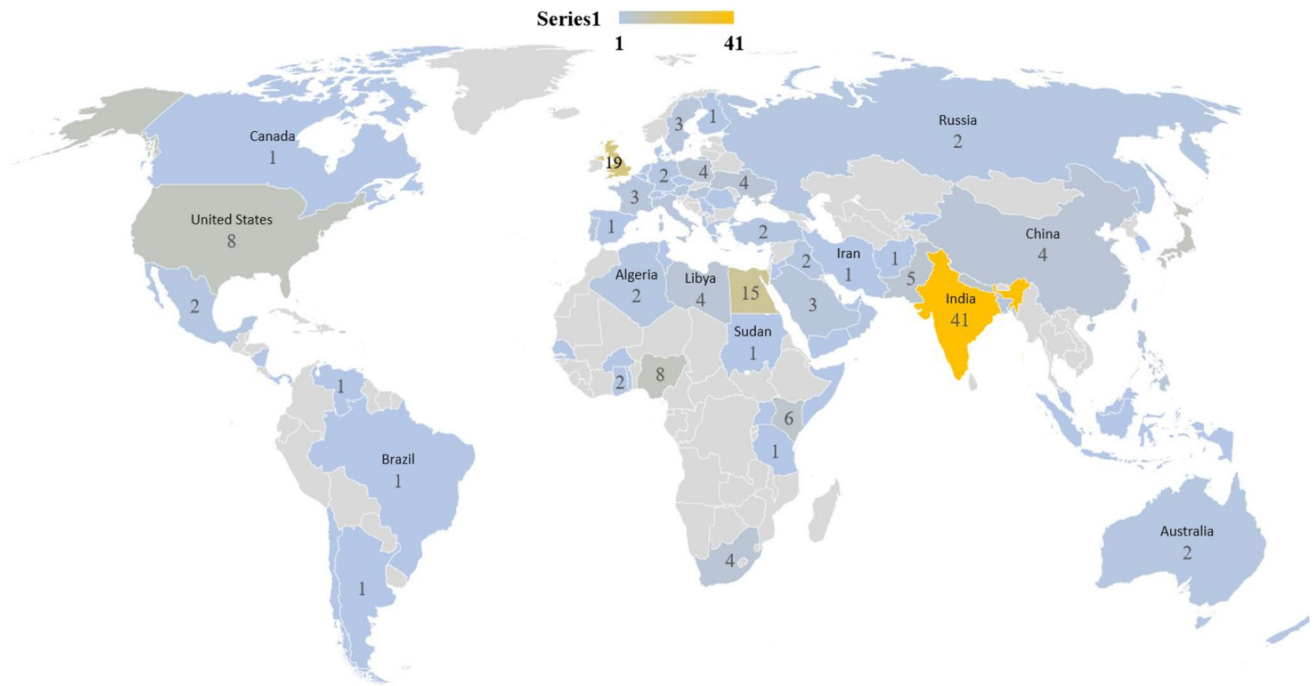
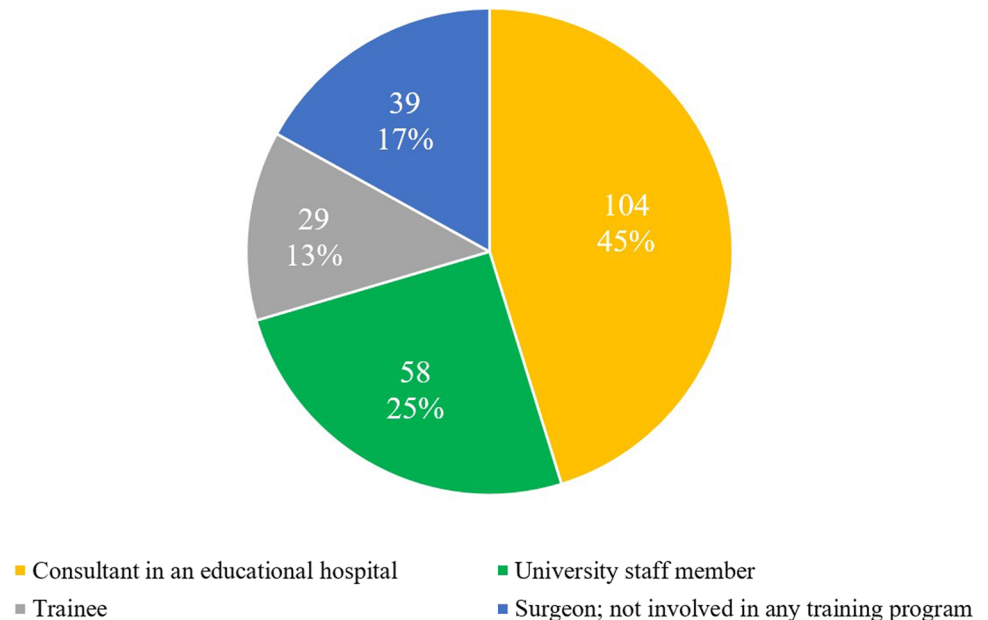


Fig. 1 Respondents' nationalities and distribution numbers

Fig. 2 Respondents' profession four categories distribution



The results of our recent survey were comparable with previously published data. Seventy-eight percent of our respondents believed that the pandemic harmed training. Bodansky et al. reported a 43% decrease in training opportunities in the UK due to the pandemic [7]. Kumar et al. noted an 86% reduction in surgical exposure for residents in India [9]. An et al. described the variable magnitude of

disruption of the training program in the USA according to the geographical distribution of the residency program [4]. In a global cross-section analysis, Bosco et al. reported a 24.7-h reduction in the time spent for training in orthopaedic residency and 50.2% of residents performed tasks not related to their residency training during the first wave [3]. Faria et al. surveyed the redeployed orthopaedic trainees if

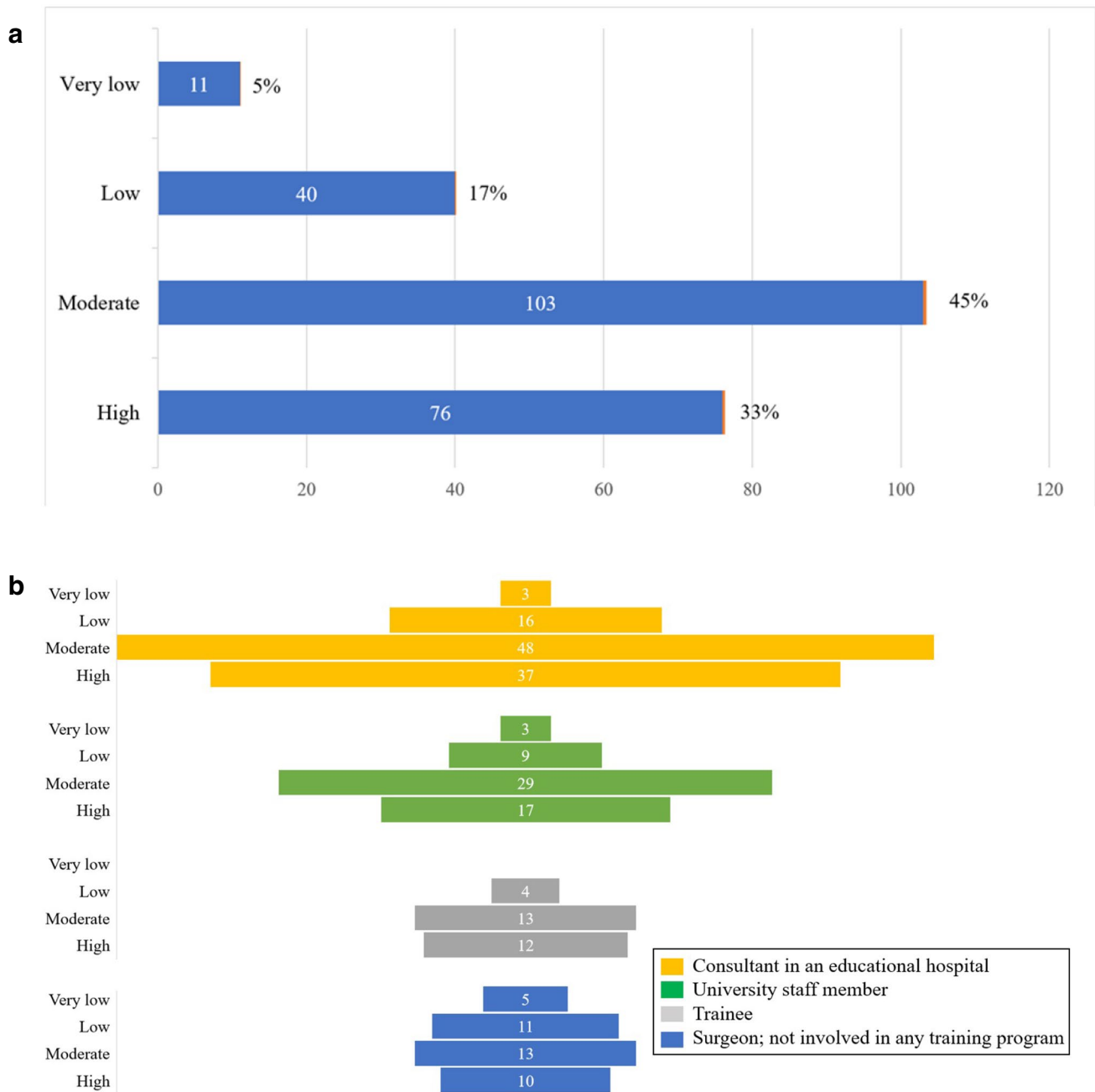


Fig. 3 a Personal opinion of the level of affection of the COVID-19 pandemic on orthopaedic training. b Personal opinion of the level of affection of the COVID-19 pandemic on orthopaedic training according to different professions views

they found the skills, they gained from working in other subspecialties would benefit them in their orthopaedic careers. However, most responded that these skills would not be applicable in their careers [10]. Similarly, Gonzi et al. measured whether trainees felt that deployment to the emergency department added to their training on a Likert scale from 1 (disagree) to 5 (agree). The mean response was 1.33 [2]. Another variable was the training service where the trainee was enrolled. When spine fellows and sports

medicine fellows were surveyed for the effect of the pandemic, 62.2% of spine fellows compared to 80.4% of sports fellows reported > 50% reduction in the number of cases they operated upon due to cancellation of elective surgery [11, 12]. A study from Ireland indicated that elective surgery was significantly reduced during the lockdown. However, trauma surgery did not decrease significantly. Interestingly, they reported an increase in hemiarthroplasties compared to the same time frame in 2018 and 2019 [13].

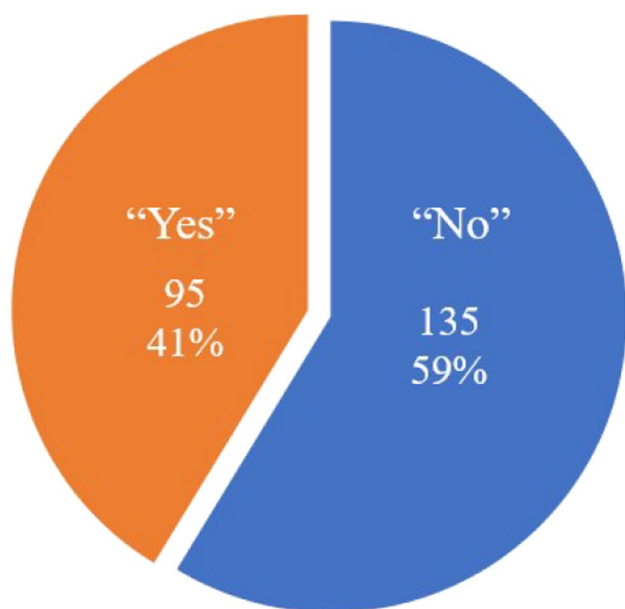


Fig. 4 The response of the national training body to COVID pandemic to cope with the defects and maintain high standards of training

We cannot ignore the negative psychological impact of the COVID-19 pandemic that casted its shadow on the bumpy trainees’ road. In our study, the trainee group answer revealed this; none of them voted for the “very low” effect on the training programs as the other groups did. Similarly, only two voted for no effect when assessing the future competency. This reflects the concerns of trainees regarding the resumption of their regular training, the schedules of their exit exams and their ability to catch up for the lost educational opportunities. Moreover, different studies reported a significant decrease in the quality of life (QOL) among trainees with increased anxiety levels [3, 5, 12]. The most common stressors were transmitting COVID-19 infection to the family due to hospital exposure and failure to fulfill training requirements due to elective surgery and clinics suspension [3, 5].

Despite the pandemic’s negative effect on the training in general, Barlow et al. in a study from Poland highlighted some positive impacts. The presence of a consultant in the trauma operation room, which was not the rule before the pandemic, led to an increase in the proportion of satisfactory radiographic position of the lag screw and tip-apex distance (TAD) < 20 mm during dynamic hip screw fixation of hip fractures from 29.6 to 42.3% [14]. Another positive impact was the exposure of this cohort of trainees to video consultations and their training for virtual clinic models [7].

An integral part of the training program is the trainee education through the didactics and lectures. Face-to-face lectures and meetings have been suspended since the beginning

of the pandemic worldwide. The good thing is that these specific educational activities continued through different virtual platforms [3, 4]. However, virtual education methods’ satisfaction was perceived as less than the traditional methods [3, 5].

Another issue that we would like to highlight is how to define the negative effect on different training aspects. While some effects can be measured by comparing the number of cases operated upon and clinic times that trainees log in, other aspects could be difficult to highlight, being non-measurable. These include the development of communication skills with the hospital staff and the patients, the ability to communicate with patients about adverse events, research skills, and others. The training systems routinely provided these skills before the pandemic, which is very important in building up the orthopaedic surgeon’s competent personality besides the surgical skills and knowledge.

Surprisingly, reactions from the responsible bodies for training assessment and validation were limited and sporadic. Only 41% of our surveyed population stated that their national body took action. The description of these actions was very variable and inconsistent, reflecting a lack of understanding or underestimating the situation. Minor clear reactions were reported from some countries. In the USA, the Accreditation Council for General Medical Education (ACGME) would accept a 10% decrease in total cases and time requirements in 2019 and 2020. In addition, the ACGME will rely on the assessment of the program director of the competence of the trainees [15]. In the UK, two outcomes were added to the Annual Review of Competence Progression (ARCP), 10.1 and 10.2. Both reflect the progress during the COVID-19 period, with outcome 10.1 denoting optional additional training time and 10.2 indicating that extra training time is required [16]. In addition, exit exams were postponed and rescheduled in different areas in the world [17]. Other authors suggested using virtual exams models [18]. A global cross-sectional survey showed that 70.6% of participants had their exit exams rescheduled, and 49.5% had their residencies extended [3].

The final question is always how this will affect the development of a competent orthopaedist in the future. Answer from our survey revealed global doubtfulness, with 47% confidently stating yes and 34% suspicious (Fig. 5a). A survey for spine fellows in North America showed that 95.5% of the fellows believed that COVID-19 would not affect their ability to complete their training. However, 32% of the program directors heard concerns from their fellows about being ready for their practice. Twenty-five percent of the spine fellows were concerned about job opportunities [12]. A similar survey of sports medicine fellows yielded similar responses [11]. A survey from Ireland showed that 35% of trainees felt that their training should be extended to fulfill the training requirements [13]. All these reflects a global uncertainty in

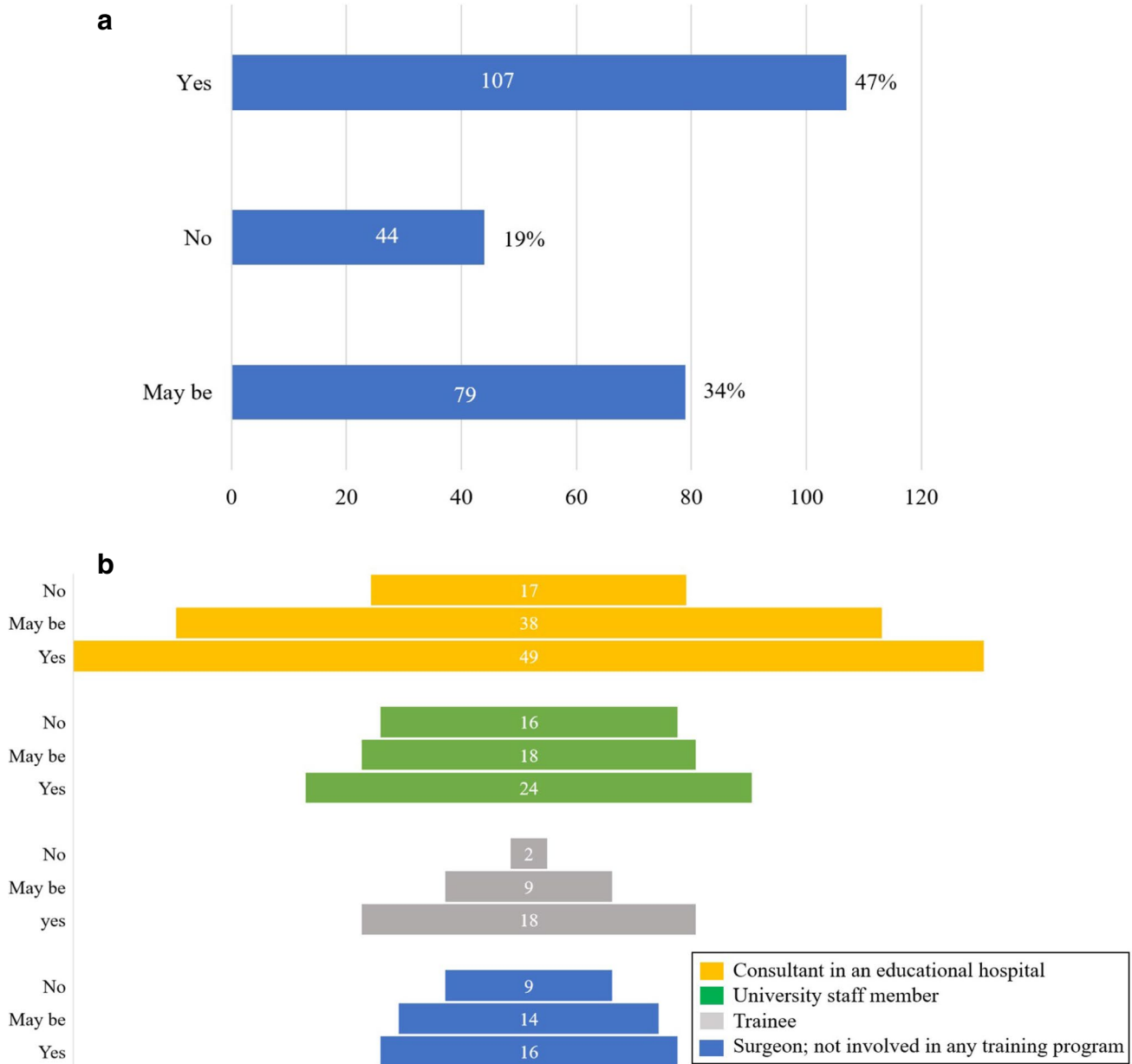


Fig. 5 a The future expectation of the effect of the COVID pandemic on the development of a competent orthopaedic consultant. **b** The future expectation of the effect of the COVID pandemic on the devel-

opment of a competent orthopaedic consultant according to different profession views

different subspecialties about the effect of training defects on future surgeons, which we will probably hear its percussions in the next few years.

The survey we conducted has several points of strength. First, it collected responses from 230 orthopaedic surgeons from 76 countries and six continents under the umbrella of a global orthopaedic society. Second, 87% of the responders were orthopaedic surgeons who finished their training, providing a perspective that differs from most of the surveys in the literature, which collected responses from trainees.

Another added value is having 80% of these surgeons deal with training care either in university or educational hospitals worldwide.

We believe that the unfortunate trainees who had their training during the COVID era should not pay for the lower educational opportunities. However, the training bodies worldwide should ensure that the training systems are still producing competent and safe orthopaedic surgeons by greater involvement of the training hospitals, program directors and faculty in the decision of graduation or extending

the education to catch up with the lost training disciplines. This can be done either in a case-by-case assessment or by assessing the areas which suffered from heavier infection rates and more periods of training disruption.

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