

Impact of the COVID-19 pandemic on young oncologists: The Greek perspective

Research Article

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Received 13 December 2023; Accepted 22 December 2023

Abstract:

Background: The global impact of the Coronavirus Disease 2019 (COVID-19) pandemic on health professionals has been profound. In response to these circumstances, the coordination committee of the Hellenic Group of Young Oncologists (HeGYO) embarked on an investigation into the well-being of its members.

Methods: For the purposes of this study, we developed a 44-question questionnaire. The responses were electronically collected and exported into data frames, which were then subjected to statistical analyses.

Results: The study cohort comprised 77 oncologists, of whom 81.7% (n=67) were under the age of 40. Survey responses highlighted the profound impact of the COVID-19 pandemic on young oncologists in Greece, with 67.5% (n=52) feeling that their work lives have not returned to pre-pandemic levels, 74% (n=57) experiencing changes in duties, and 74.0% (n=57) reporting increased working hours. Additionally, 82% (n=63) of participants reassessed their work-life balance. Notably, 92.2% (n=71) expressed fears of COVID-19 contamination, unrelated to the perceived quality of protective measures (p=0.291). Time allocated to clinical and pre-clinical research was also decreased, as reported by 36.4% (n=28) and 41.6% (n=32) respectively. Surprisingly, the pandemic did not prompt the initiation of unhealthy habits, but 51.2% (n=40) reported a reduction in physical activity.

Conclusions: In summary, this study reveals that the COVID-19 pandemic significantly altered the professional landscape for young oncologists in Greece, impacting work dynamics, research productivity, and overall well-being. These findings underscore the necessity for targeted interventions during emergencies in the healthcare in order to maintain a resilient workforce in oncology.

Keywords: COVID-19 • impact • pandemic • oncologists • young • Greece

1. Introduction

The emergence of the COVID-19 pandemic has profoundly reshaped the landscape of healthcare, presenting unprecedented challenges that extend far beyond the direct effects of the virus. While the global response has been primarily focused on managing and mitigating the immediate impact on public health, it is imperative to turn our attention to the secondary consequences affecting healthcare professionals^[1]. Among these, oncologists find themselves at the forefront of a unique and multifaceted set of challenges^[2,3],

as they are called to manage a special and vulnerable sub-population of patients^[4].

Oncology, a field already synonymous with the relentless pursuit of patient well-being and groundbreaking research, now confronts an additional layer of complexity^[5]. The pandemic has catalyzed disruptions in clinical practice, research endeavors, and the traditional mentorship pathways crucial for the professional development of aspiring oncologists^[6]. As these individuals grapple with the dual responsibility of caring for cancer patients during a global health crisis, their experiences, perspectives, and career trajectories

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are undergoing significant transformations.

This study aims to explore the multifaceted impact of the COVID-19 pandemic on young oncologists in Greece. Through an elaborate questionnaire and further analysis of data, our goal is to contribute valuable insights that can inform supportive strategies, policies, and interventions tailored to empower and sustain the next generation of oncologists in a post-pandemic world.

2. Methods

For this study, the coordination committee of the Hellenic Group of Young Oncologists (HeGYO) in collaboration with the Hellenic Society of Medical Oncology (HeSMO) developed a 44-question questionnaire. The aim was to assess the impact of the COVID-19 pandemic on young oncologists, drawing inspiration from similar questionnaires used by the European Society for Medical Oncology (ESMO)^[7]. The period for respondents to complete the questionnaire was from December 15, 2021, to July 15, 2022.

The responses to the questions were exported as entries in a spreadsheet, and statistical analyses were conducted for the purposes of this study. The statistical package used was R, version 4.3.2.

3. Results

Data were collected as submitted and completed questionnaires from December 15, 2021, to July 15, 2022. Out of the 222 eligible participants, the 77 participants contributed, forming a response rate of 35% (77/222), with the 64.9% of them being females (n=50) (Table 1).

The study encompassed the cohort of 77 oncologists who completed the questionnaires. The majority (n=67, 87.1%) fall under the age of 40 (Figure 1). Among them, 65 are affiliated with HeGYO, a group of young Greek oncologists. As anticipated, the largest percentage (n=59, 76.6%) is located in either Athens or Thessaloniki, predominantly working at University Hospitals (n=42, 54.5%), General Public Hospitals (n=15, 19.5%), Anti-Cancer Hospitals (n=8, 10.4%), and Private Clinics (n=9, 11.7%) (Table 1).

Regarding specialties, 28 individuals (36.4%) had completed their training, while 49 (63.6%) were undergoing training (n=14, 29.2% for <2 years, n=22, 45.8% for 2–4 years, and n=12, 25% for 5–6 years) at the time of submission. Medical oncology was the predominant specialty of choice, chosen by 68 individuals (88.3%). Those specialized were mostly

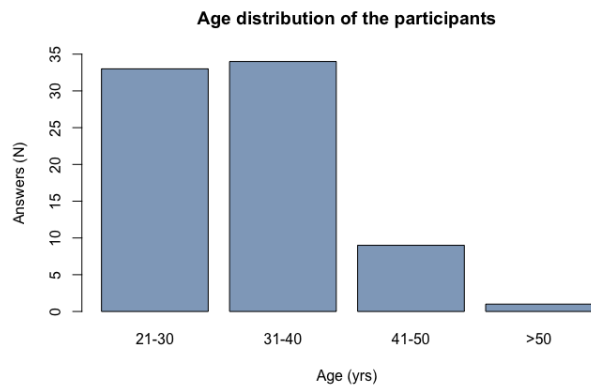


Figure 1: Age distribution of the participants.

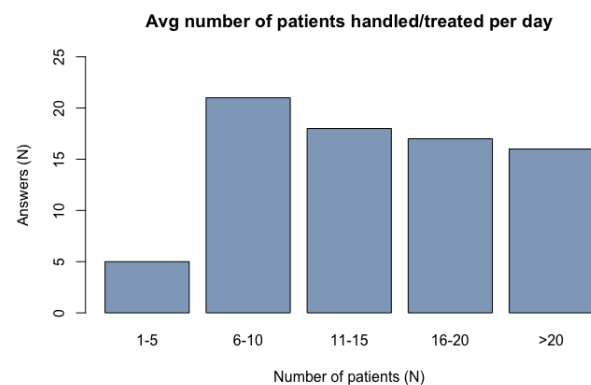


Figure 2: Average number of patients handled/treated per day.

under 5 years on practice (n=23, 82.1%) (Table 1).

A significant portion of the study participants (67.5%), who are notably active on a daily basis (with the 66.2% treating more than 10 patients per day on average), indicated that their everyday work–life has not yet returned to pre-COVID-19 levels (Table 2).

Furthermore, 74% of the participants either engaged in COVID-19 clinic duties or experienced partial changes to their own duties. These new duties occupied the majority (41.6%) for more than 3 months (Table 2).

Additionally, 75.3% reported an uptick in remote patient consultations, while 79.2% noted an increase in participation in remote oncology meetings. Moreover, increases were reported across working hours (74.0%), overtime working hours (68.8%), overnight shifts (51.9%), and overnight shifts during holidays (44.2%) (Table 2).

The COVID-19 pandemic also impacted the research output of the oncologists in the study cohort. A decrease of the time allocated on clinical and pre-clinical research was reported by 36.4% and 41.6%, respectively.

Non-optimal access to COVID-19 protective

Table 1: Demographic characteristics of the population.

Variables	Measurements
Age group, n (%)	
21–30	33 (42.9%)
31–40	34 (44.2%)
41–50	9 (11.5%)
>50	1 (1.4%)
Sex, n (%)	
Female	50 (64.9%)
Male	27 (35.1%)
Living alone, n (%)	
Yes	37 (48%)
No	40 (52%)
Workplace location, n (%)	
Athens or Thessaloniki	59 (76.6%)
Peloponnese	5 (6.5%)
Central Greece/Thessalia/Epirus	7 (9.1%)
Macedonia/Thrace	1 (1.3%)
Greek islands	1 (1.3%)
Living abroad	4 (5.2%)
Workplace type, n (%)	
University Hospital	42 (54.5%)
General Public Hospital	15 (19.5%)
Anti-cancer Hospital	8 (10.4%)
Private Clinic	9 (11.7%)
Pharmaceutical company	1 (1.3%)
Laboratory	1 (1.3%)
Military Hospital	4 (5.2%)
Specialty, n (%)	
Pathological Oncology	68 (88.3%)
Oncology–Hematology	3 (3.9%)
Research	1 (1.3%)
Pathology	3 (3.9%)
Nuclear medicine	1 (1.3%)
Rural service	1 (1.3%)
Specialty training, n (%)	
Completed	28 (36.4%)
Undergoing	49 (63.6%)
Years undergoing training, n (%)	
<2	14 (29.2%)
2–4	22 (45.8%)
5–6	12 (25%)
Years on practice post training, n (%)	
<5	23 (82.1%)
5–10	3 (10.7%)
>10	2 (7.2%)

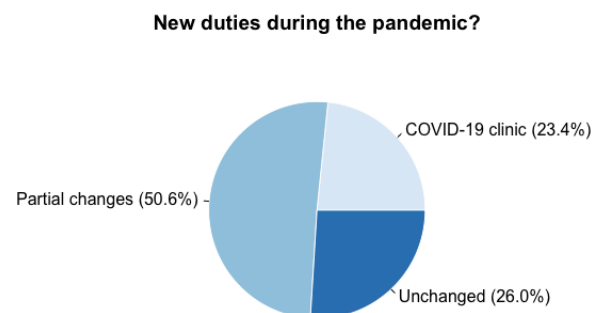


Figure 3: New duties during the pandemic – as reported by the respondents.

Table 2: Clinical experiences of the population.

Variables	Measurements
Average patients per day, n (%)	
1–5	5 (6.5%)
6–10	21 (27.3%)
11–15	18 (23.4%)
15–20	17 (22.1%)
20	16 (20.7%)
Everyday life at work at pro COVID-19 levels, n (%)	
Yes	25 (32.5%)
No	52 (67.5%)
New duties during COVID-19? n (%)	
Yes, COVID-19 clinic duties	18 (23.4%)
Yes, Partial change of duties	39 (50.6%)
No	20 (26.0%)
Duration of new duties, n (%)	
<1 month	7 (9.0%)
1–3 months	16 (20.8%)
>3 months	32 (41.6%)
No new duties	22 (28.6%)
COVID-19 clinic duties, n (%)	
Yes, <3 months	19 (24.6%)
Yes, >3 months	25 (32.5%)
No	33 (42.9%)
Remote patient consulting, n (%)	
Increase	58 (75.3%)
Decrease	0 (0.0%)
Unchanged	19 (24.7%)
Remote (oncology) meetings, n (%)	
Increase	61 (79.2%)
Decrease	3 (3.2%)
Unchanged	3 (16.9%)
Work from home, n (%)	
Yes	28 (36.4%)
No	49 (63.6%)
Working hours, n (%)	
Increase	57 (74.0%)
Decrease	2 (2.6%)
Unchanged	18 (23.4%)
Overtime working hours, n (%)	
Increase	53 (68.8%)
Decrease	1 (1.3%)
Unchanged	23 (29.9%)
Overnight shifts, n (%)	
Increase	40 (51.9%)
Decrease	0 (0.0%)
Unchanged	37 (48.1%)
Overnight shifts during holidays, n (%)	
Increase	34 (44.2%)
Decrease	1 (1.3%)
Unchanged	42 (54.5%)

measures, although reported by 81.8%, was not associated with the fear of spreading or contracting SARS-CoV-2 during work, which is indicated by 92.2% (X^2 -test: $p = 0.291$, Cramer's $V = 0.216$, Contingency Coeff. = 0.351).

Apart from the aforementioned, a large percentage believes that COVID-19 will have a negative impact on their professional training (80.6%), on career (46.8%), or on potential opportunities for observerships/fellowships

Impact of the pandemic on research output

Clinical & Pre-clinical, oncologist's perspective

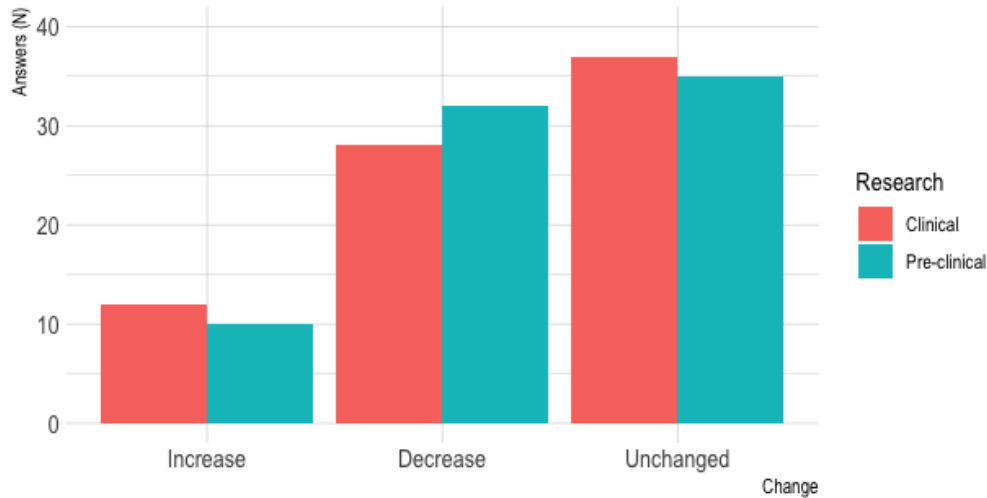


Figure 3: Impact of the pandemic on clinical and pre-clinical research output.

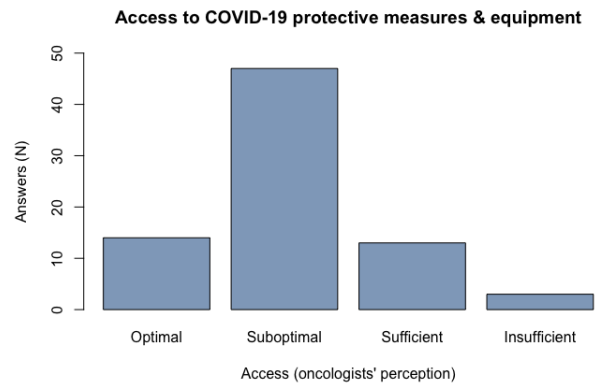


Figure 4: Access to COVID-19 protective measures and equipment.

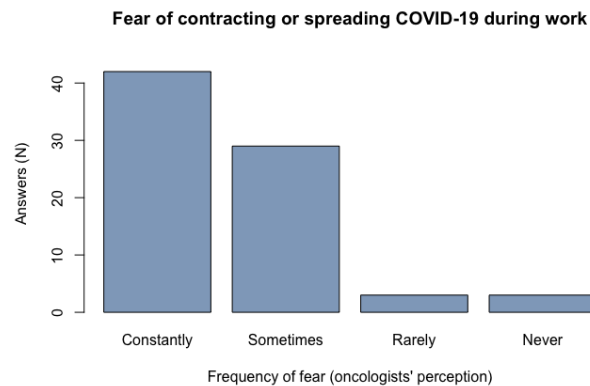


Figure 5: Fear of contracting or spreading COVID-19 during work.

Table 3: Impact on research.

Time allocated on clinical research (clinical trials), n (%)	
Increase	12 (15.6%)
Decrease	28 (36.4%)
Unchanged	37 (48.1%)
Time allocated on pre-clinical research, n (%)	
Increase	10 (12.9%)
Decrease	32 (41.6%)
Unchanged	35 (45.5%)
COVID-19 related pre-clinical/clinical research, n (%)	
Increase	16 (20.8%)
Decrease	13 (16.9%)
Unchanged	48 (62.3%)

Table 4: COVID-19 first-line safety and fear of spread.

Access to COVID-19 protective measures and equipment, n (%)	
Optimal	14 (18.2%)
Sub-optimal	47 (61.0%)
Sufficient	13 (16.9%)
Insufficient	3 (3.9%)
Fear of being infected with SARS-CoV-2 or spreading it during work, n (%)	
Constantly	42 (54.5%)
Sometimes	29 (37.7%)
Rarely	3 (3.9%)
Never	3 (3.9%)

(84.5%) (Table 5).

Table 5: Participant's perceptions of the effects of the pandemic on their development.

COVID-19 will adversely affect my professional training, n (%)	
Strongly agree	30 (38.9%)
Agree	32 (41.6%)
Disagree	4 (5.2%)
Strongly disagree	1 (1.3%)
Uncertain	10 (13%)
COVID-19 will adversely affect my career, n (%)	
Strongly agree	13 (16.9%)
Agree	23 (29.9%)
Disagree	15 (19.4%)
Strongly disagree	3 (3.9%)
Uncertain	23 (29.9%)
COVID-19 has had a detrimental effect on potential opportunities for observerships/fellowships, n (%)	
Strongly agree	38 (49.4%)
Agree	27 (35.1%)
Disagree	5 (6.5%)
Strongly disagree	0 (0.0%)
Uncertain	7 (9.0%)

The COVID-19 pandemic has significantly impacted various facets of oncologists' lives. The overwhelming percentage of 81.9% reassessed the value of work–life balance. Called to evaluate the role of family during the pandemic, the participants' selections varied. The 28.6% indicated that family had a supportive role and helped in reducing stress. On the other hand, the 24.7% reported elevated stress caused by concerns about the intra-family transmission of COVID-19 and the 33.8% had to stay apart from their families for a period due to concerns of the transmission of SARS-CoV-2. Finally, the 12.9% was neutral (Table 6).

Regarding smoking habits, no one began, 7.8% increased it, 10.4% decreased it, 2.6% quit, and the vast majority, 79.2%, were non-smokers. Similar trends were observed for drinking habits. Only one participant (1.3%) started drinking alcohol, whereas 18.2% reported an increase, compared to 12.9% who noted a decrease. Three participants (3.9%) stopped drinking, and the majority, 63.7%, were non-drinkers. There was only one report (1.3%) of initiation of psychotropic substance use during the pandemic, while 98.7% were non-users (Table 6).

The 51.2% of the participants reported a reduction in their workout habits during the pandemic, with an additional 9.1% completely ceasing exercise. When queried about the negative impact of the COVID-19 pandemic on their sexual lives, the oncologists in the study cohort provided responses in balanced percentages, with 29.9% expressing uncertainty. Similar trends were observed regarding potential sleep disorders arising from the pandemic (Table 6).

Table 6: Participants' perception of the effects of the pandemic on their personal lives and habits.

During the pandemic, I reassessed the value of work-life balance, n (%)	
Strongly agree	25 (32.5%)
Agree	38 (49.4%)
Disagree	2 (2.6%)
Strongly disagree	1 (1.3%)
Uncertain	11 (14.2%)
Role of family during COVID-19, n (%)	
Supportive and helped in reducing stress	22 (28.6%)
Elevated stress caused by concerns about the intra-family transmission of COVID-19	19 (24.7%)
I had to stay apart from my family for a period due to concerns about the transmission of SARS-CoV-2.	26 (33.8%)
Neutral impact during the pandemic	10 (12.9%)
Smoking during the pandemic, n (%)	
Started	0 (0.0%)
Increased	6 (7.8%)
Decreased	8 (10.4%)
Stopped	2 (2.6%)
Non-smoker	61 (79.2%)
Alcohol during the pandemic, n (%)	
Started	1 (1.3%)
Increased	14 (18.2%)
Decreased	10 (12.9%)
Stopped	3 (3.9%)
Non-drinker	49 (63.7%)
Psychotropic substances during the pandemic, n (%)	
Started	1 (1.3%)
Increased	0 (0.0%)
Decreased	0 (0.0%)
Stopped	0 (0.0%)
Non-user	76 (98.7%)
Exercise during the pandemic, n (%)	
Started	3 (3.9%)
Increased	14 (18.2%)
Decreased	40 (51.2%)
Stopped	7 (9.1%)
Does not exercise	13 (17.6%)
COVID-19 had a negative impact on sexual health, n (%)	
Strongly agree	6 (7.8%)
Agree	21 (27.3%)
Disagree	23 (29.9%)
Strongly disagree	4 (5.1%)
Uncertain	23 (29.9%)
Sleep disorders during COVID-19, n (%)	
Strongly agree	9 (11.7%)
Agree	23 (29.9%)
Disagree	23 (29.9%)
Strongly disagree	7 (9.1%)
Uncertain	15 (19.4%)

4. Discussion

Even in the early stages of the COVID-19 pandemic, research had already amassed compelling evidence indicating that frontline healthcare workers were susceptible to both physical and mental health consequences directly attributed to their provision of care to COVID-19 patients and the evolving conditions^[8]. Certain medical specialties encountered challenges

beyond the typical spectrum, and this was notably true for oncologists. Not only were they tasked with overseeing a particularly vulnerable patient population prone to severe illness from SARS-CoV-2 infections but they were also enlisted to fulfill frontline responsibilities in COVID-19 clinics.

The repercussions of these challenging times on the well-being of oncologists became evident early on. As indicated by a pre-vaccine study, more than half of the participating oncologists reported a moderate-to-severe impact of the pandemic on both their personal and professional lives^[9]. The study highlighted safety concerns for their families and patients, highlighted the intricacies of delivering patient care, and disclosed that 50% of them experienced an elevated sense of burnout at work since the onset of the pandemic. These observations persisted throughout the pandemic. Hlubocky et al. delved into the topic of oncologist burnout and well-being, offering insights into mitigation and resilience measures while raising awareness and providing considerations^[10]. Cancer care, practice, and research were affected as a result^[11]. A well-cited paper by Mike Richards et al highlights implications across various aspects, including diagnosis, surgery, radiotherapy, treatment, ongoing care, and clinical trials^[12].

Young oncologists have been significantly affected by the circumstances surrounding the pandemic. In addition to the previously mentioned impacts on personal and professional levels, they have had to confront consequences in terms of their training and practice. A paper by Hans-Michael et al, which focuses on student and resident teaching and training in surgical oncology, delves into the repercussions of the pandemic for medical students in this specific specialty. The paper emphasizes the necessity for innovative solutions^[13]. Moreover, a study conducted by the Spanish Society of Medical Oncology (SEOM) in collaboration with ESMO highlights profound effects of the pandemic on the well-being of young oncologists. The study found that 25.1% of them reported significant levels of burnout, 37.3% exhibited scores indicating anxiety, 30.4% experienced moderate or severe depression, and 23.3% had doubts about their medical vocation^[14].

In our study, 67.5% of participants reported that their everyday work life has not yet returned to pre-COVID-19 conditions, indicating a lasting impact of the pandemic on young oncologists. Furthermore, 74% of the respondents reported altered medical duties, a significant percentage that underscores the profound changes brought about by the pandemic in the healthcare system. Subsequently, there was a 75.3% increase in remote patient consultations. To provide a comparison, ESMO's Resilience Task Force Survey II

findings indicated an 89.2% increase^[15]. In contrast to ESMO's noted increase of 38.4% in overall working hours, nearly double that percentage (74%) was reported in our study. In addition to the previously mentioned statistics, a significant majority holds the belief that COVID-19 will adversely affect their professional training (80.6%), career (46.8%), and potential opportunities for observerships/fellowships (84.5%).

Safety is an integral part of frontline medicine and inadequate access to measures, and fear of infections was a profound issue during the early days of the global outbreak^[16]. Far into the pandemic, this issue still seems to persist. 81.8% of our participants reported non-optimal access to COVID-19 protective measures, which though was not associated to the fear of spreading or contracting SARS-CoV-2 during work, indicated by the 92.2% (X^2 -test: $p = 0.291$, Cramer's $V = 0.216$, Contingency Coeff. = 0.351) (Table 4, Figure 4&5).

The intricate and highly stressful circumstances of the pandemic have regrettably paved the way for the initiation and exacerbation of detrimental habits among healthcare workers. Extensive research has consistently shown a noticeable surge in tobacco use during this period^[17, 18, 19]. However, it is noteworthy that among young Greek oncologists, only 7.8% reported an escalation in their smoking habits, and none initiated smoking. Similarly, the escalation of alcohol consumption among healthcare workers during the pandemic has been extensively documented^[20, 21, 22], with 18.2% of the participants in our study indicating an increase in their drinking habits. Moreover, the pervasive burnout and stress experienced by frontline personnel have led to the prescription and use of psychotropic drugs^[23]. Remarkably, within our cohort, only one participant reported resorting to such substances. These findings underscore the complex interplay between the pandemic-induced stressors and the varied responses among healthcare professionals.

The influence of COVID-19 extends beyond its psychological impact on healthcare workers, significantly affecting their physical activity and lifestyle habits^[24]. Widespread reductions in exercise have been thoroughly documented and studied, with 51.2% of our questionnaire respondents reporting such decreases^[25]. The demanding work hours and elevated stress levels have also contributed to sleep disorders among frontline healthcare workers^[26, 27], a sentiment shared by 59.8% of participants in our study who strongly agreed or simply agreed that they experienced sleep disorders during the pandemic.

Finally, oncology stands as the most active field in terms of clinical trials, heavily relying on breakthrough treatments and novel combinations of existing

ones^[28]. Although the pandemic disrupted clinical trials and introduced a new level of complexity^[29], these challenging conditions have also spurred innovations and adaptations that might have taken years to implement under normal circumstances. Notably, the field has witnessed the digitalization of processes, a reduction in documentation burden, faster data acquisition, and improved translation of research into clinical practice^[30, 31]. In our study's cohort, participants reported a decrease in the time allocated to clinical and pre-clinical research by 36.4% and 41.6%, respectively (Table 3, Figure 3). In comparison, ESMO's Survey II notes a persisting reduction in clinical trials and research activities by 65.8% and 55.8%, respectively.

5. Conclusions

In conclusion, the multifaceted impact of the COVID-19 pandemic on healthcare workers, particularly young oncologists in our case, extends beyond the immediate challenges of patient care and safety. Our findings highlight the enduring effects on the professional and personal lives of these frontline professionals. The

study underscores the persistence of elevated levels of burnout, altered work dynamics, and disruptions in training and career trajectories. Despite the adversity, it is noteworthy that the oncology field has demonstrated resilience, adapting to the challenges by embracing digital innovations and streamlining research processes. However, the toll on mental health, lifestyle habits, and the pervasive uncertainty regarding the future of medical training and career opportunities cannot be understated. As we navigate the ongoing ramifications of the pandemic, it is imperative for healthcare institutions to prioritize the well-being of their workforce, offering comprehensive support and targeted interventions to mitigate the long-term consequences observed in this study. Moreover, lessons learned from the adaptations made in the field of oncology can inform broader strategies for enhancing healthcare resilience and innovation in the face of future global health crises.

Conflicts of interests

The authors declare no relevant conflicts of interest.

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