The Global Impact of the COVID-19 Pandemic on Ophthalmic Training: A Worldwide Systematic Review

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Introduction and Methods

Introduction

COVID-19 has resulted in unprecedented disruption to all aspects of healthcare, including the **training of future ophthalmologists**; which may indirectly **negatively impact patient care**. This systematic review highlights **key issues** for Ophthalmology trainees, categorising them as:

- Clinical
- Surgical
- Psychological

We also highlight certain **positive impacts** that the pandemic has had on Ophthalmic training as well as demonstrating the **potential solutions**.

Methods

Acknowledging the global-effect of the pandemic, **worldwide** English-language literature was searched using Medline and Embase with search-terms:

Ophthalmology, ophthalmologists, medical education, trainees, interns, internships, residents, coronavirus, COVID-19, clinical, surgical, psychological impacts

Of 416 total papers obtained, 81 were directly relevant.

Clinical issues

Ophthalmic department closure + ↓ in all but emergency patients + redeployment + exposure-reduction-rosters + ↓ teaching + social distancing → severely reduced patient-volume & limited , hands-on training globally[2,11,25,33,69,77]

Undergraduate:
- ↓ in-person learning / clerkships[19,24,45,55,66,75]
- Whole newly-graduating general-physician cohort with little-no ophthalmic exposure[50,67,76]
- Potential –ve impact on future patients' care, ↓ residency-application opportunities + ↓ in ophthalmic specialisation recruitment[16,46]

Residents:
- Lack of exposure: ↓ in-person evaluation, resident redeployment[31]. Disparity between countries in adopting tele-med e.g. Turkey,[35] India: 73% saw no patients during lockdown[18]
- Traditional teaching only partially replaced by remote activity.[12,47] Ophthalmic 'bedside-teaching' opportunities, skills-based teaching, educational-meetings/journal-clubs eliminated[2,41,59,63]
  Some units: little-no teaching provided.[11,13] Cairo: 50-75% ↓ teaching, Brazil: no contingency plan[18,26]

Fellowships: cancelled international opportunities[11]
CESR: unable to progress on CESR application[3]
Exams: modified/cancelled, ↓ pass-rates[3,49,68]
Potential applicants: virtual-interviews, unable to access pre-interview informal visits[19,27,53,72-3]
Research: disrupted timelines, halted studies, redirected resources, ↓ funding, ↓ thesis work, in-person networking + collaborations diminished, female scientists disproportionately affected[24,30,32,39,55,62]

Surgical issues

Surgical training essentially stopped → diminished case-volume as both surgeon and assistant due to suspension of surgeries + patient fear + social distancing i.e. limited people allowed to be present in theatre – particularly disproportionate impact on Ophthalmology[28,33,35,39,52,74]

- Lost practice in development of fine motor skills & hand-eye coordination[61]
- Lost opportunities for even observational surgical learning from masters[61]
- Use of surgical tele-mentoring limited and only of uncertain usefulness[22]
- Unable to complete minimum volume requirements: greater impact on those in super-specialty/later years of training[44]
- Loss of confidence; higher complication risk[41]
- Lack of foundational cataract exposure most concerning; cases available post-wave are more challenging[31,47,65]
- ↓ in office-based practical procedures: cross-linking, intravitreal injections, lasers[4,74]
- Lost skills can't be fully replaced by simulation[13,18]
  - Wet-labs restricted/not always permitted [23]
    Postcode lottery: machine-simulation-practice not the norm in more resource-poor countries; animal-eyes not always representative[55,60-1]
  - Fewer outreach-screening eye camps which forms a large part of LEDC country eye training[56]

Psychological issues

Significant ↑ in negative effects on mental health

Concerns about career progression
- Concerns about surgical skills deteriorating [10,47,69]
- Derailed career progression and placements – e.g. obtaining funding/fellowships and having to repeat rotations [8,9,41,69]
- Academic anxiety – e.g. grant applications or research projects being threatened[32]

Negative effects of the pandemic generally on mental health
- General stress or anxiety – e.g. about catching/spreading the virus, close contact with patients, redeployment or even guilt at not being redeployed[1,3,4,9,18,28,34,35,41,43,44,45,47,57,58,69,79]
- Financial concerns from lack of clinical work[8,9,35,37,52]
- Higher rates of depression[1,18,28,41,44,79] – in 1 survey of Indian trainees 32.6% had some form of depression (compared to 10% prevalence of common mental health disorders)[37]
- Insomnia noted as worse in trainees [1,18,79]
- Increased loneliness[57]
- "Zoom fatigue"[18,43,47,82] - from being inundated with resources

Disproportionate effects on sub-groups
- Several studies show a female preponderance for depression or anxiety[1,18,28,79]

Negative coping strategies employed by trainees
- Cancelling leave or pressure to return from sick leave[11,78]
- Increased alcohol intake, sleeping aids, substance use[69]

Occasionally noted positive impacts
- 1 study noted less depersonalisation and emotional exhaustion[77]

Positives and Solutions

1.Adaptation of training to socially-distanced & largely online or simulation training

1.Online resources increasingly used and well received, and can be easily promoted online and via social media – e.g. e-learning, webinars, grand rounds [4,5,8,13,18,21,22,24,26,27,30,33,34,38-45,47,50,52,53,59,63,68,82]

2.Innovative learning opportunities still allow clinical exposure, research, presentations, networking – e.g. virtual placements/electives, online conferences, virtual research projects that still teach basic research tools and methods[13,14,16,19,27,36,44,50,75]

3.Adapting surgical skills training – telementoring, simulators (e.g. EyeSi, HelpMeSee), wet-lab cadaver/animal/mock eyes, slit-lamp cameras, simulation apps, Virtual and Augmented reality resources[5,10,12,18,23-25,29,31,34,36,39,41,43,44,47,48,52,56,57,59,60,63,68,70,71,80,82]

2.Improving access to training resources and interviews/exams

1.Virtual training = more convenient, reduces financial burden and recorded sessions also increase flexibility. Frees up time – e.g. for patient care and research. Helps international educators reach a wider audience. [2,4,8,13,14,15,17,18,22,26,27,30,32,39,42,43,44,45,68,70,72,73]

2.Adapting interview and assessment methods – virtual program tours and examinations improve access, loosening certain application requirements (e.g. not mandating electives, extending application deadlines, extending valid dates for evidence), competency-based rather than volume-based procedural requirements, implementing standardised virtual exams/OSCEs [3,9,27,41,43,46,47,49,53,55,74]

3.Extending training time with shorter more frequent rotations to prevent complete disruption of single rotations [8,18,19,43,65]

4.Providing psychological and emotional support programs – e.g. mentoring, counselling, meditation and mindfulness sessions [1,4,9,38,41]

3.Accelerating the use of telemedicine for safer, cost-effective care that trainees can more easily engage in

1.Better virtual Primary-Secondary-Tertiary care integration with access to specialist MDTs, virtual triaging to identify high risk patients or more stable patients for trainees to see, increased caseload due to more efficient virtual consults, incorporation of remote investigations (e.g. home VA, visual fields, IOP, OCT devices)[15,22,27,32,38,47,70,82]

Conclusions and Key Learning Points

- Key clinical / surgical issues related to a reduction in workload (especially theatre-time / procedural-exposure), virtual-clinics and associated diminished learning-experiences. Widespread disruption to **formal training-processes** ensued, including rotations, interviews, examinations, fellowships, conferences and collaborations.
- The **negative clinical/surgical impact** had a detrimental effect on trainees' **wellbeing**, concerning deteriorating practical-skills and difficulty in training-progression. This led to psychologically negative actions, including overworking/leave-cancellation due to increased pressures to "catch-up".
- However, some **potential training benefits** have arisen from COVID-19.
- Virtual-training delivered by specialty-leaders increased access to, and quality of, training. Sessions were logistically easier to attend with lower financial burdens. Trainers have been motivated to explore innovative teaching techniques. Alongside the detrimental effect of COVID-19 on training, **potential solutions** including novel uses of technology (e.g. surgical telementoring, virtual placements) have arisen. Foundational changes to training, involving a shift from volume-based to competency-based assessments may also be required.

Lessons from this review can be taken forward to improve the training-climate where situations such as COVID-19 affect exposure to clinical opportunities.

References

For references please scan the following QR code: