ORIGINAL RESEARCH

Problems and solutions to conduct of thesis of postgraduate medical students during the COVID-19 pandemic: an insight into the students perspective

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Purpose: The coronavirus disease 2019 (COVID-19) pandemic has adversely impacted medical education worldwide. However, its impact on the postgraduate medical thesis and dissertation work is still not evaluated. Through this study, we planned to find out the problems brought by the pandemic and likely alternatives and possible solutions to thrust the academic competence of postgraduate students.

Methods: After obtaining institutional ethics committee approval, we sent a 13-item questionnaire to postgraduate medical students in India via various social media online platforms. Data on the impact of the COVID-19 pandemic on thesis work and alternatives/solutions to improve the research competence were collected on a Likert scale and analyzed.

Results: We received a total of 398 responses out of which 377 entries were included for final analysis. The majority of participants (88%) reportedly had an adverse impact on the thesis work and out of 25% of the participants who recently submitted their around 45% had to do so without achieving the estimated sample size. The 6-month departmental review for thesis progress was seen in merely 28% of participants. Possible alternatives suggested were the maintenance of log books, task-based assessment of research methodology, departmental audits, and systematic reviews. Solutions suggested for improving the research competence of students were a compulsory research methodology curriculum, a biostatistics department in each institution, permission to conduct thesis work beyond submission time, exclusive time for research work, and financial incentives.

Conclusion: Modification in the research aspect of the current postgraduate medical education is the need of the hour and the pandemic has enlightened us regarding the current weaknesses.

Key Words: Medical education, Academic dissertation, Academic training, COVID-19, Pandemics

Introduction

During a pandemic, healthcare systems re-channelize all their resources including manpower to focus on managing the outbreak, limiting the spread of the disease, and preventing the healthcare system from collapsing. Such a shift during the coronavirus disease 2019 (COVID-19) pandemic however resulted in interruption of the medical education even in the most successful medical training programs [1,2].

Besides the clinical activities, teaching, and training, producing a research paper or thesis is an essential step for a student graduating from medical school [3]. A typical

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postgraduation training in India for specialties is usually 3 years for degrees and 2 years for diploma courses and the super specialty training further involves 3 years post-specialization. During the training period of 2 to 3 years, the student goes through clinical rotations including emergency duties, regular academics involving didactic lectures, seminars, group discussions, case presentations, and journal clubs. To potentiate academic competence and research-based critical analysis thinking skills, the National Medical Council (NMC; formerly Medical Council of India, MCI) mandates that each student is required to undertake a research topic with a faculty as the guide and or co-guide from the concerned specialty. However, dissertation research by Indian postgraduate students remains invisible in international literature, and conversion to publication is abysmally low due to various factors involving time constraints, poor mentorship, and lack of funding [4]. The COVID-19 pandemic with all its effects made this scenario further worse.

We, therefore, planned to conduct this survey to find out the problems in the conduct of thesis/dissertation work during the time of the ongoing pandemic. To the best of our knowledge, this is the first survey to evaluate the impact of the COVID-19 pandemic on the conduct of a thesis for postgraduate medical students across all specialties. This study aims to find the size ability of the problems associated with the conduct of thesis and dissertation work of postgraduate medical students and suggest tangible solutions for the same to improve academic productivity.

Methods

1. Methodology

After obtaining approval from the institutional ethics committee, we conducted an online questionnaire-based survey (Appendix 1) and sent it to all postgraduate medical students using various online and social media chat platforms. The questionnaire contained a series of a total of 13 questions which are either short answers or multiple-choice types and prepared on google forms. The questions were designed based on a literature search, personal experiences, and feedback from students. Open-ended questions are also included. The content validity of the questionnaire was performed before snowballing by experts (senior faculties and postgraduate medical students). They rated each question on a Likert scale based on simplicity, clarity, ambiguity, and relevance. The reliability of data was checked after the test-retest method on 21 students. After data collection, a descriptive analysis was conducted.

2. Statistical plan

1) Sample size calculation

The sample size was calculated with Sample Size Calculator (https://www.surveysystem.com/sscalc.htm). For deriving the sample size, we calculated the approximate number of postgraduates across India to be approximately around 35,000 as per the MCI and Diplomate of National Board websites [4]. Considering the reachability of at least 60% of students and assuming a minimum two-sided 95% confidence level, 5% margin of error, and standard deviation of 0.5, a minimum sample size of 376 was obtained.

2) Data analysis

Data was analyzed using multiple measures of dispersion, and cross-tabulations. Categorical data were presented as percentages or frequencies as appropriate. One sample chi-square test was used for comparing proportions with the expected count in all the cells of at least 5. GraphPad Prism ver. 8.0 (GraphPad Software, San Diego, USA) was used for the chi-square test.

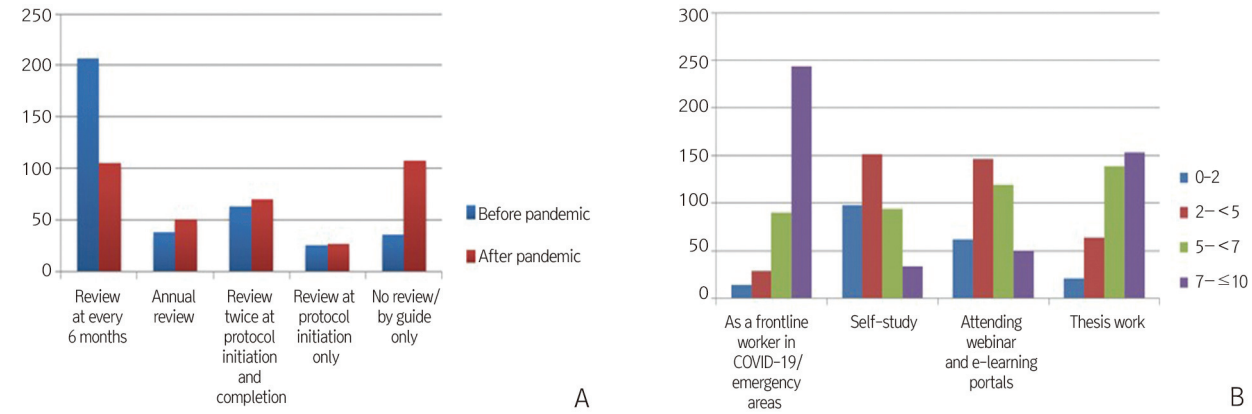
3. Ethical approval

The study was approved by the Institutional Ethics Committee, All India Institute of Medical Sciences, Bhubaneswar as an exemption on July 15, 2021 (T/IM-NF/Anesth/21/50).

Results

Data were collected from 398 participants and entries from 377 participants were included for final analysis. The demographics of the 377 participants are depicted in Fig. 1A and Table 1.

Fig. 1. Effect of the Pandemic on Postgraduate Thesis



(A) Departmental thesis review meetings before and after the pandemic. (B) Time utilization of the postgraduate students during the pandemic

Table 1. Demographics of the Survey Participants

Characteristic	No. of participants (%)
Type of institutes/medical college and hospital	
Central government	257 (68)
State government	65 (17)
Private	46 (12)
Corporate	9 (2)
Degrees pursued by the participants	
MD	212 (56)
MS	79 (21)
DM	35 (9)
MCh	36 (9)
FNB/DNB	15 (4)
Subjects in which students pursued specialization/super-specialization	
Anesthesiology and critical care	117 (31)
Orthopedics	38 (10)
General medicine	23 (6)
General surgery	25 (6)
Obstetrics and gynecology	27 (6)
Pulmonary medicine and critical care	9 (2)
Others	123

(Continued on next page)

Table 1. (Continued)

Characteristic	No. of participants (%)
Type of study given as thesis topic	
Randomized clinical trial	150 (40)
Prospective observational	179 (47)
Retrospective study	14 (4)
Descriptive studies	34 (9)
Was the thesis topic related to COVID-19 patients?	
Yes	21
No	356

MD: Doctor of Medicine, MS: Master of Science, DM: Doctor of Management, MCh: Magister Chirurgiae, FNB: Fellowship of National Board, DNB: Diplomate of National Board, COVID-19: Coronavirus disease 2019.

Table 2. Effect of the Pandemic on the Thesis

Question	No. of participants	χ^2	p-value
Q1. How badly was the thesis affected?		451.87	<0.0001
Severely	220		
Moderately	113		
Mildly	36		
Not affected	4		
Benefitted	4		
Q2. Have you achieved your sample size in the thesis submitted/done in the current year?		0.163	0.68
Submitted and sample size achieved	51		
Submitted and sample size not achieved	47	102.36	<0.0001
Not submitted, but anticipated sample size achieved	55		
Not submitted, but anticipated sample size not achieved	224		
Q3. Provision of relaxation on timing for submission of thesis protocols/final manuscript		9.23	<0.0024
Yes	218		
No	159		

1. Effect of the pandemic on thesis:

The thesis was affected due to the pandemic adversely by 88% of the participants and mildly by 10%. Only 5% of participants had a thesis that was related to COVID-19 patients. While assessing the participants on the current timeline around 98 (25%) of the participants had submitted their thesis recently; out of which around 48% had submitted without achieving the estimated sample size; however, there were no statistically significant differences in that group (χ^2=0.163, p=0.68) (Table 2). Out of the rest, 280 participants (75%) who were yet to submit their thesis, around 80% reportedly did not achieve the anticipated sample size (χ^2=102.36, p<0.0001).

Around 218 participants informed that their concerned institutes had provided relaxation in the time limit for submission of thesis/ protocols whereas 159 suggested they did not receive any (χ^2=102.63, p<0.006). However, there was no significant difference noted between the type of institutes (central/state/private/corporate) (Table 2).

The most common problems for the conduct of the thesis reportedly and the effect of the pandemic situation on the departmental thesis review meetings were as represented in Table 2.

2. Alternatives and suggestions

As per the participants, the best alternatives to pursuing a thesis during postgraduation could be systematic

Table 3. Problems Faced in Conduct of Thesis

Q4. Problems faced in conduct of thesis	No. of participants
Issues in recruitment (decrease footfall/change of inclusion or exclusion criteria, post-COVID-19 status)	231
Early fallout of cases from intervention/loss to follow-up	176
Posting to thesis unrelated to COVID-19 areas	173
Procedural limitation (risk of aerosol generation)	100
Prolonged illness/quarantine of self/family member	79
Less availability of mentor/guide due to excessive COVID-19-related clinical work	77

COVID-19: Coronavirus disease 2019.

Table 4. Alternatives and Suggestion to Improve Thesis Work in Postgraduation

	Yes	No	Neutral	χ^2	p-value
Alternatives to thesis				39.19	<0.0002
Systematic reviews and meta-analysis	131	132	114		
Departmental audits presented at national conferences	172	117	88		
Publication of case reports as first/corresponding author	166	126	58		
Maintenance of portfolio/log book	193	91	93		
Task-based assessment of research methodology	167	113	99		
Publication of protocol/original idea	160	115	102		
Suggestions to improve the conduct of thesis work				23.41	<0.009
Research methodology must be before protocol submission (65%)	247	70	61		
Collaborative studies involving multiple departments with two or more students (submitting the same but good quality thesis) (57.5%)	217	72	88		
Permission to conduct thesis study post-submission	220	96	61		
Exclusive time separate from clinical and academic work	242	72	63		
Biostatistics department in each medical college	254	67	56		
Financial incentives for thesis completion	222	80	75		

reviews/metanalysis (35%), departmental audits (46%), publication of case reports as first/corresponding author (44%), maintenance of portfolio/logbook (51%), task-based assessment of research methodology (44%), and publication of protocol/original idea (30%) (Table 3).

Survey participants suggested options for improving the current thesis program for completion of postgraduation which included research methodology must before protocol submission (65%), collaborative studies involving multiple departments with two or more students (submitting the same but good quality thesis) (57.5%), permission to conduct thesis study post-submission (58%), exclusive time separate from clinical and academic work (64%), a biostatistics department in each medical college (67%), and financial incentives for thesis completion (88%) (Table 4).

The time utilization of the pandemic with distribution in clinical work as a frontline worker, thesis work, attending webinars, and self-study was assessed on a Likert scale of 0-10, and data is presented in Fig. 1B.

Discussion

To the best of our knowledge, this is the first survey to evaluate the impact of the covid pandemic on the conduct of a thesis for postgraduate medical students across all specialties.

Most of the participants in our survey were from government institutes as most of the latter have turned into nodal centers for the clinical management of COVID-19 patients during the pandemic. Also, the majority of the

participants included postgraduates from anesthesiology possibly because two authors from this study are faculties in the department of anesthesiology and could reach more anesthesiologists via networking. Secondly, the postgraduates from the anesthesiology, critical care, and internal medicine were the core departments conferred with the primary care of COVID-19 positive patients as per the guidance by the Ministry of Health and Family Welfare, Government of India. Nonetheless, all other specialties have made a significant contribution to the clinical management of patients even outside the clinical purview because of the acute shortage of manpower during acute waves. In a recent survey done on orthopedic residents in northern India [5], more than 70% of the postgraduate trainees had a clear impact on their thesis work. As per our study, the numbers were still higher at 88% possibly because we included all specialties, and the sample size was larger.

Thesis and dissertation work has its challenges most commonly as its time-limited and can lead to exclusion of various research questions and thereby publication-oriented study designs. Time constraints in research work have always been highlighted as obstacles in academic research work in previous studies [6,7]. As per a survey done in India, a postgraduate medical student spends 60-100 hours per week on clinical rotation uniformly throughout the residency which leaves negligible time left for thesis work [8]. Excessive clinical workload during the pandemic, prolonged health issues of self and family including quarantine period, and loss to follow-up of cases because of patients turning covid positive in interventional studies further potentiated the time-bound challenge. Around 77% of participants in our survey spent less than 50% of their time on thesis work and around 40% spent less than 20% of their time on thesis work. Apart from that the physical and mental health also might have led to unnecessary fatigue and procrastination of the students. In our study close to 42% of the survey participants informed that there was no relaxation provided by the local ethics committee for submission of protocol/main manuscript at the time of doing the survey (July to August 2021 where the majority of participants responded to the survey). Although there was a notification from NMC in July 2021 regarding the relaxation of the sample size and timing of submission of the postgraduate thesis, clearly many students were already affected in the previous year. Secondly, the sample size is a huge limiting factor for meeting the publication criteria of high-impact journals. As per our survey, around 50% of the submitted thesis did not achieve the anticipated sample size and more than 75% of the ongoing projects did not achieve the anticipated sample size as per their planned timelines. This problem was highlighted in other studies too [5]. This would be a grave issue if not tackled appropriately: more and more thesis work either just lying in the libraries for the sake of degrees, loss of research motivation to the upcoming generation, and probable publication in predatory journals. To tackle this problem, rather than reducing the sample size which would yet again bring down the quality of the project for publication, an exclusive unhindered research time separate from clinical rotation could be allowed to the students, and the same was affirmed by 64% of our participants. Harvard Medical School in their MD (Doctor of Medicine) thesis requirements has mentioned a minimum commitment of full-time of at least 4 months for research purposes with an additional period of a complete 1 month for thesis writing [9]. Similarly, Yale School of Medicine also allows first-year medical students full-time research work with an additional 3 to 4 months in the 3rd and 4th year [10]. As per a study done on urology residents, research productivity doubles with an additional year of dedicated research time [11]. Similarly, till the pandemic is officially called off, the sample size criteria for submission to the institutional research section may

be given a "relaxation" mainly for experimental studies where there are problems due to recruitment and loss of follow-up with permission to complete the due thesis post submission or after the exit examinations with an extension for research work without which the degree may not be conferred. The extension period may also be supported with financial remuneration for further motivation. Around 58% of the survey participants also suggested this method of continuing the thesis post-submission could be adapted for improving the thesis work in the pandemic era.

As per a survey done by Abhari et al. [12] on expert professors and postgraduate managers, the three most important steps which help in advancing dissertation work include time tracking the progress by the mentors, providing feedback on the student's ideas and problems, and holding regular sessions with students expressing the expectations from the students explicitly. Accessibility of the supervisor was considered one of the major hurdles in the conduct of the thesis as per many studies. In our study, around 20% of participants felt that the accessibility of guides was reduced due to excessive COVID-19-related clinical duties. This was also reflected in the data which showed a gross plummeting of 6 monthly departmental meetings for thesis progress from 57% in the prepandemic to 28% in the pandemic period and pushing towards "no departmental meetings" at all in 33% of the participants versus 12% in the prepandemic period. The incorporation of information technology into academic research supervision like Google Meet, Zoom, and WhatsApp as suggested by many for medical education, and the use of tele- and online-supervision systems would be helpful to achieve a higher level of supervision and motivate the students further [12].

Financial support for the conduct of the thesis with even paid research workdays can be an excellent initiative that could be taken up for motivation of students for research work as per 59% of the survey participants. Inadequate financial support has been cited as one of the reasons for the poor conduct of research by 41% of participants as per an analysis in India [13]. Uniform provision for financial incentives/stipends for full-hour research work as provided in many international universities in the United States, and Canada with the meeting of deadlines would motivate the better research output of students.

One of the many factors for good quality research projects in developed nations is a research-oriented curriculum with a structured research program that involves research rotation of varying duration from 1 month to 1 year [14,15]. This could be possible with a dedicated biostatistics department in each medical college to foster more research-based education in addition to the compulsory research methodology training for all postgraduate residents implemented by the NMC. Close to 65% of the students in our survey were in favor of conducting the research methodology training much before protocol submission and maybe even earlier in undergraduate levels would help in better orientation.

Another strategy to cope with the small sample size and problems in recruitment during the pandemic times was a suggestion of having a thesis as collaborative work in multiple departments which was supported by as many as 58% of participants. For example, a single intervention is done on a single group of patients; however, the outcomes of interest may be different. Here each of the students may write their protocols separately and involve guides from two separate departments. Similarly, a single study may be given to two students so that they can divide the sample size and work on it. This would not only reduce the stress level but also may induce good team-based research work.

Considering the alternatives to research studies like experimental and observational studies, one of the strongest suggestions was to maintain a logbook or

portfolio as most of the time is spent in clinical or lab rotations, which also means the thesis to be made optional and not mandatory akin to countries like the United Kingdom and Europe [16]. Systematic reviews have long been argued in favor of PhD (Doctor of Philosophy) theses, although there are experts who argue against this but can be considered as an option in challenging times. Few other alternatives favored by the participants were case reports published in indexed journals, clinical audits, and publication of protocol or original ideas that can be left open for discussion to stakeholders; however, we as authors believe it would definitely help in building up the academic portfolio of the student to an extent but still may lack in the holistic development of a clinician with an ability to critically analyze literature evidence and put them into practice.

The strength of the study is that it provides practical solutions for improving the research education policies which would help not only help during crises like pandemics but also identify the existing loopholes and provide a tangible solution for the same. Secondly, the survey participants have been kept anonymous so that transparency of the collected data may be maintained.

The limitations of this study are that the survey findings represent the viewpoints of the students and not the policymakers, program directors, or faculties at large which is important while reframing and implementing new policies.

In conclusion, various transformational steps in the postgraduate medical research methodology curriculum should be sought which should focus on the research output of the medical students and thereby motivate them to embark on their journey toward becoming clinician-scientists.

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Appendix 1. Problems in Conduct of Thesis during COVID-19 Pandemic in India: A Nation-Wide Survey of Postgraduate Medical Students (PROCON THESIS)

The effect of the coronavirus disease 2019 (COVID-19) pandemic on the conduct of thesis work of postgraduate medical students: a nationwide survey

This survey is to find out the problems in the conduct of thesis-related work by postgraduate medical students who have been on the front line in the management of pandemic in India.

I. Demographics

1. Which of the following type of hospital you belong?
   Mark only one oval.
   - ◯ State government medical college and hospital
   - ◯ Central government medical college & hospital
   - ◯ Private medical college & hospital
   - ◯ Corporate hospital

2. Which of the following courses you are currently following/were in the last 1 year as a trainee?
   Check all that apply.
   - ◯ MD (Doctor of Medicine)
   - ◯ MS (Master of Science)
   - ◯ DM (Doctor of Management)
   - ◯ MCh (Magister Chirurgiae)
   - ◯ DNB (Diplomate of National Board)
   - ◯ FNB/PhD (Fellowship of National Board/Doctor of Philosophy)

3. Which subject specialization/super-specialization you are currently pursuing?

4. What is your type of study?
   Mark only one oval.
   - ◯ Randomized controlled trial
   - ◯ Prospective observational (cohort or case control)
   - ◯ Retrospective
   - ◯ Descriptive

5. Was your study related to COVID-19 patients?
   Mark only one oval.
   - ◯ Yes
   - ◯ No

6. How frequently is your departmental meetings being held to review thesis progress?
   Check all that apply.

	Before pandemic	After pandemic
Every 6 months	☐	☐
Every year	☐	☐
Only at protocol initiation	☐	☐
Twice: at protocol initiation and final submission	☐	☐
No departmental meetings/only review by the guide	☐	☐

II. Effect of pandemic on thesis/research project

7. How is your thesis work/research project impacted by the pandemic?
   Mark only one oval.
   - ☐ Strongly affected
   - ☐ Moderately affected
   - ☐ Mildly affected
   - ☐ Not affected
   - ☐ Benefitted

8. What problems did you face in the conduct of thesis at the time of ongoing COVID-19 pandemic (multiple options can be selected).
   Check all that apply.
   - ☐ Problem in finding feasible thesis topic
   - ☐ Early fall out of cases from intervention/control arms/loss to follow-up (e.g., recruited patient turning positive)
   - ☐ Changing of inclusion/exclusion criteria in the middle of the conduct of study to achieve the sample size
   - ☐ Problems in recruitment
   - ☐ Procedural limitation (e.g., risk of aerosol generation/risk of infection)
   - ☐ Posting to unrelated thesis COVID-19 areas
   - ☐ Prolonged illness (self/family)/self-quarantine
   - ☐ Post-COVID-19 status of recruited patients leading to exclusion/delay in the recruitment in the study
   - ☐ Less availability of guide/mentor to review the progress because of the COVID-19 work
   - ☐ No problem

9. What were the problems in recruitment of cases? (multiple options can be selected.)
   Check all that apply.
   - ☐ Decrease footfall of non-COVID-19 patients to hospital
   - ☐ Patient profile is different from the usual non-pandemic times
   - ☐ Problems in time management due to covid duties(prolonged duties, exhaustion)
   - ☐ Limited open service areas (e.g., elective OT, limited procedures, limited intensive care unit (ICU) beds, limited samples)
   - ☐ Shortage of equipment, manpower, and drugs for the conduct of the study (as these shunted to COVID-19 care)
   - ☐ Difficulty in achieving consent from patients
   - ☐ Difficulty to conduct because of lockdown/transport issues
   - ☐ I didn't face any problem in recruitment/enrollment of cases

10. Have you achieved your sample size in the thesis submitted/done in the current year?
    Mark only one oval.
    - ☐ Yes, submitted and sample size achieved
    - ☐ No, submitted without achieving full sample size
    - ☐ Yet to submit and anticipated sample size achieved
    - ☐ Yet to submit and anticipated sample size not achieved

11. Did your local IEC/University provide you with a relaxation on the timing for submission of thesis protocols/final manuscript?
    Mark only one oval.
    - ☐ Yes
    - ☐ No

12. What are alternative options to mandatory thesis submission for getting degree? (need to select each row.)
Mark only one oval per row.

	Strongly disagree	Disagree	Neither agree/ disagree	Agree	Strongly agree
Systematic reviews/meta-analysis as alternative	◯	◯	◯	◯	◯
Departmental audits & presentation in national conferences	◯	◯	◯	◯	◯
Publication of 2 or more case reports as first/corresponding author indexed journal	◯	◯	◯	◯	◯
Publication of protocol/original idea in an indexed journal	◯	◯	◯	◯	◯
Portfolio/logbook of self in departmental projects/manuscript publication (team-based research rather than student alone approach)	◯	◯	◯	◯	◯
Task-based assessment of research methodology(e.g., planning a protocol/project for a problem during exam)	◯	◯	◯	◯	◯

13. What suggestions to improve the quality of thesis work? (need to select each row.)
Mark only one oval per row.

	Strongly disagree	Disagree	Neither agree/ disagree	Agree	Strongly agree
Research methodology training must before protocol submission	◯	◯	◯	◯	◯
Permission to conduct thesis post-submission to achieve a sample size	◯	◯	◯	◯	◯
Collaborative studies involving multiple departments with 2 or more students (submitting the same but good quality thesis)	◯	◯	◯	◯	◯
Research should be separated from clinical work (e.g., fixed exclusive time for research in a week/month)	◯	◯	◯	◯	◯
Biostatistics department in medical college to facilitate research	◯	◯	◯	◯	◯
Financial incentive (for peer-reviewed original idea)	◯	◯	◯	◯	◯

14. Any other suggestion

15. How was the pandemic best utilized by you? (on a scale of 0 to 10.)
Mark only one oval per row.

	7–10	5–7	2–5	0–2
As a front line worker in COVID-19/emergency areas	◯	◯	◯	◯
Self-study	◯	◯	◯	◯
Attending webinar & elearning portals	◯	◯	◯	◯
Thesis/research project related work	◯	◯	◯	◯

III. Demographics

16. Which of the following type of hospital you belong?
Mark only one oval.
- ◯ State government medical college and hospital
- ◯ Central government medical college & hospital
- ◯ Private medical college & hospital
- ◯ Corporate hospital

17. Which of the following courses you are currently following/were in the last 1 year as a trainee?
Check all that apply.
- ☐ MD
- ☐ MS
- ☐ DM
- ☐ MCh
- ☐ DNB
- ☐ FNB/PhD

18. Which subject specialization/super-specialization you are currently pursuing?

_____

19. What is your type of study?
Mark only one oval.
- ◯ Randomized controlled trial
- ◯ Prospective observational (cohort or case control)
- ◯ Retrospective
- ◯ Descriptive

20. Was your study related to COVID-19 patients?
Mark only one oval.
- ◯ Yes
- ◯ No

21. How frequently is your departmental meetings being held to review thesis progress?
Check all that apply.

	Before pandemic	After pandemic
Every 6 months	☐	☐
Every year	☐	☐
Only at protocol initiation	☐	☐
Twice: at protocol initiation and final submission	☐	☐
No departmental meetings/only review by the guide	☐	☐

IV. Effect of pandemic on thesis/research project

22. How is your thesis work/research project impacted by the pandemic?
Mark only one oval.
- ◯ Strongly affected
- ◯ Moderately affected
- ◯ Mildly affected
- ◯ Not affected
- ◯ Benefitted

23. What problems did you face in the conduct of thesis at the time of ongoing COVID-19 pandemic? (multiple options can be selected.)
Check all that apply.
- ◯ Problem in finding feasible thesis topic
- ◯ Early fall out of cases from intervention/control arms/loss to follow-up (e.g., recruited patient turning positive)
- ◯ Changing of inclusion/exclusion criteria in the middle of the conduct of study to achieve the sample size
- ◯ Problems in recruitment
- ◯ Procedural limitation (e.g., risk of aerosol generation/risk of infection)
- ◯ Posting to unrelated thesis COVID-19 areas
- ◯ Prolonged illness (self/family)/self-quarantine
- ◯ Post-COVID-19 status of recruited patients leading to exclusion/delay in the recruitment in study
- ◯ Less availability of guide/mentor to review the progress because of the COVID-19 work
- ◯ No problem

24. What were the problems in recruitment of cases? (multiple options can be selected.)
Check all that apply.
- ◯ Decrease footfall of non-COVID-19 patients to hospital
- ◯ Patient profile is different from the usual non-pandemic times
- ◯ Problems in time management due to COVID-19 duties (prolonged duties, exhaustion)
- ◯ Limited open service areas (e.g., elective OT, limited procedures, limited ICU beds, limited samples)
- ◯ Shortage of equipment, manpower, drugs for the conduct of study (as these shunted to COVID-19 care)
- ◯ Difficulty in achieving consent from patients
- ◯ Difficulty to conduct because of lockdown/transport issues
- ◯ I didn't face any problem in recruitment/enrollment of cases

25. Have you achieved your sample size in the thesis submitted/done in the current year?
Mark only one oval.
- ◯ Yes, submitted and sample size achieved
- ◯ No, submitted without achieving full sample size
- ◯ Yet to submit and anticipated sample size achieved
- ◯ Yet to submit and anticipated sample size not achieved

26. Did your local IEC/university provide you a relaxation on timing for submission of thesis protocols/final manuscript?
Mark only one oval.
- ◯ Yes
- ◯ No

27. What are alternative options to mandatory thesis submission for getting degree? (need to select each row.)
Mark only one oval per row.

	Strongly disagree	Disagree	Neither agree/ disagree	Agree	Strongly agree
Systematic reviews/meta-analysis as alternative	◯	◯	◯	◯	◯
Departmental audits & presentation in national conferences.	◯	◯	◯	◯	◯
Publication of 2 or more case reports as first/corresponding author indexed journal.	◯	◯	◯	◯	◯
Publication of protocol/originalidea in anindexed journal	◯	◯	◯	◯	◯
Portfolio/logbook of self in departmental projects/manuscript publication (team-based research rather than student alone approach)	◯	◯	◯	◯	◯
Task-based assessment of research methodology (e.g., planning a protocol/project for a problem during exam)	◯	◯	◯	◯	◯

28. What suggestions to improve the quality of thesis work? (need to select each row.)
Mark only one oval per row.

	Strongly disagree	Disagree	Neither agree/ disagree	Agree	Strongly agree
Research methodology training must before protocol submission	◯	◯	◯	◯	◯
Permission to conduct post-submission of the thesis to achieve sample size.	◯	◯	◯	◯	◯
Collaborative studies involving multiple departments with 2 or more students (submitting the same but good quality thesis)	◯	◯	◯	◯	◯
Research should be separated from clinical work (e.g., fixed exclusive time for research in a week/month)	◯	◯	◯	◯	◯
Biostatistics department in medical college to facilitate research	◯	◯	◯	◯	◯
Financial incentive (for peer-reviewed original idea)	◯	◯	◯	◯	◯

29. Any other suggestion

30. How was the pandemic best utilized by you? (on a scale of 0 to 10)
Mark only one oval per row.

	7–10	5–7	2–5	0–2
As a front line worker in COVID-19/emergency areas	◯	◯	◯	◯
Self-study	◯	◯	◯	◯
Attending webinar & elearning portals	◯	◯	◯	◯
Thesis/research project related work	◯	◯	◯	◯