

## COMMENTARY

## Maximizing the potential and outreach of Department of Community Medicine and School of Public Health in COVID 19

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Teaching and learning has existence from the earliest times of human civilization. Socrates in 300 BC involved his learners by dialectic method which has inspired philosophers for more than two thousand years. The argumentative dialogue based on oral questioning and answering process to stimulate critical thinking in the dialectic method allowed others to learn by self-generated deeper understanding.(1) The Gurukul teaching in the ancient vedic time encourages the students to stay in guru's place (termed as Gurukul) where the education was delivered through scriptures describing vedas, rules of sacrifice, understanding secrets of nature and correlating them with their real life. In these times, the education was more organized and disciplined focusing upon memory retention and concentration(2). The learning through script and writing started in 3500BC where Egyptians developed alphabets from hieroglyphs prototype which was used either on stone monuments or on papyrus, a flexible paper like material.(3)The script was later adopted by Greeks (Phoenician writing system)(4) in 11th century and

thereafter by China in 1400-2100BC (oracle bone script).(5)

The teaching tools have a long history, chalkboard being the oldest inspired from the earliest cave paintings found over 40,000 years ago where minerals like red ochre, chalk and charcoal was used to draw over stone, slate, or a pieces of wood. Later the fine-grained rock labeled slate was developed in green, blue, grey and black colors. Blackboard led to an impactful pedagogy during the ancient Babylonia and Sumeria who used clay tablets with a stylus to write and then erase to be used again or baked for preserving the document. (6) It was mid-19th century when blackboard came up in classrooms and over the decades usage of various teaching board (green board, whiteboard, brown board, interactive board) to advancement of transparencies and teaching aids were used.(7)

With advancement, the mobile learning devices like tablets, laptops, and media players progressed in the system which enhanced educational possibilities through Internet which has opened doorway to a wealth of information and educational resources.

These have provided access to a limitless amount of information that is available anytime and anywhere. These devices have been used as a learning tool for delivering higher education and in the dispersing information in the field of health and had turn out to be a significant tool for developing distance education processes.(8) The use of advanced teaching and learning tools has gained pace in last few decades with the occurrence of emerging and reemerging infectious diseases.(9,10)

In 2020, COVID 19 pandemic perpetuated the entire world by causing the largest morbidity and mortality by any infectious disease globally in the past century.(11) The COVID-19 outbreak has impacted nations in a massive way, especially the nationwide lockdowns which have brought social and economic life to a standstill.(12) The life of people in terms of work, education, medical and food resources have been diverted in meeting the never-experienced-before crisis.(13) To flatten the curve of pandemic various countries including India undertook diverse public health approaches like restriction of travel, closure of schools and universities compulsory wearing of mask, social distancing, intensive screening and testing, field surveillance strategies including, contact tracing; isolation and quarantine. (14) The impact of the pandemic led to reorganization of available medical resources and patient care worldwide.(15)

The pandemic has led to severe disorganization of public health education along with service delivery due to the mass closures of institution and universities. As the demand escalated the education industry transformed from distance learning to e-learning to m-learning. This unexpected situation has pushed inevitably to rely on technology-based learning (E-learning).(16) The traditional methods of education got suspended necessitating innovation in educational programs.(17) Before COVID 19, medical education system was mainly done through in person didactic lectures, face to face interaction, and participant presentation. Field visits and clinical rotations were considered more efficient. (18) The academic innovations had taken a sudden turn the face-to-face interactions in large-group settings is the budding center for disease spread and transmission. The technology and simulation based teaching was thought to be the need of the hour. Technology like videoconferencing, use of e-learning platforms like Google meet, Skype, Cisco webex, zoom, Go to webinar and you tube were adopted for

conducting online lectures.(19–22) Also, real time via teleconference application was used by residents, medical students and faculty to consult patients and demonstrates medical procedures.(23) Leveraging and optimization of digital approaches have played invaluable role in overcoming challenges and to boost the access to effective, accessible, and consumer-friendly care for more patients and the caretakers.(24)

This advancement of online technology in all spheres of education has both advantages and disadvantages. The online format permits easy accessibility to educational material as per their convenience via handheld devices and laptops. The students and teachers can opt for a favorable environment and at the same time maintain social norms like social distancing or isolation. Besides, increased virtual discussions with peers, through user friendly online technology is not only cost and time efficient but also a unique way to develop integration of collaborative skills.(25,26) However online education is limited by interrupted internet access, inequitable access to technology, restrictions of face to face interaction and ethical issues.(27)

The Department of Community Medicine and School of Public Health (DCM&SPH)in Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.(28) has undertaken spectrum of activities in teaching, training and service. Myriad education by harnessing online platforms and strengthening service activities was the main focus of evolution of a feasible pattern of healthcare delivery for the masses. Few initiatives in this COVID19 period in using these online platforms at teaching, training, research and service delivery component are described here under in this article.

## Teaching

**Classes:** Three regular courses viz. Doctor of Medicine (MD), Masters in Public Health (MPH) and Bachelors in Public Health (BPH) with a duration ranging from 2 – 3 years are being run by the department. In these courses theoretical and practical concepts are taught through classroom teaching and field postings. During COVID 19, these classes were suspended and online classes were motivated in the department. Teaching through tasks and activities were assigned to the students (Junior and Senior residents). In addition, students were asked to participate in the journal club online through Google meet which is a regular activity in the

department where discussion over the scientific paper is being done. The students and faculty was sent a link with the information of the lecture and journal club was circulated through a whatsapp group and email to all in the department. It was proven to be an important source of knowledge dissemination.

**Examination:** The Masters of Public Health (MPH) is a two-year program running since 2007 in the Department of Community Medicine & School of Public Health. Due to the imposition of the lockdown across the nation a crisis was faced in regular academic activities in the department. To conduct the final MPH first and second years examinations in the department various possibilities were explored, which included conduction of examination in staggered manner or waiting for another session or delaying examination and buying more time. Finally, the online platform came out to be the ultimate way for supporting academic activities during the pandemic. Though theory exams were eventually conducted in person adopting all norms of social distancing however practical examination was conducted through online mode. External examiners were consulted regarding the preference for online/ in person viva voce, to which apprehension were made regarding restricted interstate travel and increasing susceptibility to infection due to travel.

Various standard operating procedures (SOP's) for conduction of examination were developed including the criteria for online platform, scoring system, role and responsibilities, timelines, prior instruction to examiner & students, and conduction of online viva voce. Based on the literature review, online video conferencing software's were selected. All the meetings were communicated through emails and guidelines regarding the procedure of login and conduction of practical examination were shared with the external and internal examiners. A dummy (pilot) practical examination was done which helped in smooth flow of the examination. Examination was scheduled for 4 days including the written and viva voce. On the day of examination all logistics for online videoconferencing were checked beforehand and URL for the viva was shared an hour before the conduction of the exam. The technical coordinators (junior demonstrators) used two laptops with strong internet connection for the conduction of practical exam, one was used for overall control of the meeting which included the permission for entry of new participants, audio and time management,

whereas the second laptop was used by the student for the conduction of interview. All the external and internal examiners joined the meeting from their respective places using PC / Phone. A total of 4 examiners were in the panel. Five minute was allocated to every examiner for asking question to each participant. Instruction regarding the flow of questions between the examiners and two bell hints at 4 and 5 minutes were told to the examiners for better time management. Before the viva voce student was instructed to first sanitise his/ her hands and ensure wearing of mask. Video conferencing was done with examiners sitting at different states and screen sharing was enabled from both the ends. Minor audio-video issues were encountered; overall the viva was conducted successfully. Lastly, all the examiners circulated the final evaluation in the given format through email and communicated the same on the phone. No delay was encountered in the routine schedule of examination.

#### **Public defense of Doctor of Philosophy (PhD)**

**evaluation:** Besides many courses, our institute also offers 3-5 years Doctor of Philosophy program (PhD) for graduates with a degree like MBBS/BDS/BVSc/BE/MSc, MPH. One of the students submitted his thesis to the primary author of the current study. Reports from the external examiners were received but public defense could not be conducted because of quarantine guidelines and restriction for interstate travel by the external examiners. As soon as the training branch notified the virtual public defense of PhD students of the institute through a notice received to the guide, the permission to conduct virtual interview of one of the PhD student through online platforms such as Google Meet/ Zoom/ Skype was obtained. We received the permission and the department conducted the first public defense of a student through online mode. The DCM and SPH also became the first department of the institute to conduct the virtual public defense within the department (other department's utilized facility of telemedicine department).

The student along with the external faculty was informed about the details. The defense notice was widely circulated on the faculty mail of the institute and other formal groups of Masters of Public Health and PhD students. On the day of the interview, the google meet link was shared to the groups and within the institute. The technical coordinators (Junior demonstrator within the department) were handling the online platform and were given the responsibility

of recording the session, taking pictures, maintaining the entry of the audience on the platform, and tackling technical issues. Video conferencing was done with examiners sitting at Delhi and Bhubaneswar and the PhD participant (at Pune) was asked to make the power point-presentation. Screen sharing was done from the participant's side. The whole session went well without major audio-video related issues. Lastly, the chief examiner circulated the final evaluation format through email and communicated the same on the phone.

The online platform was a big advantage for the organization, participant and examiners. The student and examiners were benefited as no special permissions were needed for interstate travel, saving their time and effort for travel and stay. The social distancing norms were maintained and their mental dilemma regarding quarantine was avoided as chances of getting interpersonal infection were absent. For the institute, there were minimal financial and logistical liabilities (in comparison to personal appearance)

## Trainings

**Capacity building through Webinar:** In light of Corona virus situation, the primary author was asked by Indian Technical and Economic Cooperation (ITEC) – Ministry of External Affairs (MEA) – Government of India (GOI)(29) to conduct a webinar series 'Managing COVID-19 pandemic: Experiences and Best Practices of India' for international participants from 161 ITEC nations. The facilitators of the program undertook preparatory work of planning the lectures along with finalizing the presentations and recorded them in virtual settings through a series of e-meetings. Standard operating procedures were developed and teams were asked to work as per the deadlines. Two webinar and a panel discussion were organized for global participants on best and replicable practices and experiences of India in managing COVID19 pandemic. The webinar was done through OBS software and streamed live on YouTube. Participant's information sheet developed on Google form was shared on their official email accounts which had details regarding online platform, steps to join, and a link for registration. Open Broadcaster Software (OBS) was chosen because it's free, user friendly and open-source cross-platform with inbuilt streaming and recording program. It works both on macOS and windows. Sessions were either live or recorded on

You Tube through the stream key. The audience was free to chat and leave comments in the chat section where the hosts were continuously addressing the queries. This was a real life example of learning by doing.(30) In addition to conducting these online webinars during COVID19, many other webinar were conducted which are mentioned below.

**Conference:** The E-Resource Centre for Tobacco Control (E-RCTC)(31) under Department of Community Medicine & School of Public Health, PGIMER, Chandigarh in collaboration with Strategic Institute of Public Health Education and Research (SIPHER)(32) and The Union South East Asia (The Union)(33) hosted the virtual National Summit on World No Tobacco Day, 2020 with WNTD's theme "Protecting youth from industry manipulation and preventing them from tobacco and nicotine use" during the COVID times. The Google form circulated through different social media platforms (email, Facebook, twitter, instagram) garnered over 600+ registrations from India as well as countries of South East Asia Region such as Sri Lanka, Bangladesh, and the Maldives. Licensed zoom platform was used; the host was looking after the security of the video call which prevents the misuse of web link. A custom registration URL was shared with the speakers (40+ from India and other countries) enabled eminent leaders of various organizations to be present virtually, thus minimizing time and resource for organizing physical conferences. The discussion was broadcasted live on YouTube and was recorded, edited and posted on E-RCTC official website for dissemination and future use which was beneficial for the visitors of the page.

## Research

Research is a prime consideration of the department, since its inception. Being a research institute everyone was asked to contribute in the research by undertaking various studies and developing research proposals with an aim to contribute in generating knowledge in regard to COVID 19 and various domains.

## Service

**Contact Tracing:** With the pandemic situation worsening day by day, the DCM and SPH constituted a contact tracing team under the leadership of primary author of the paper. The team was designated to look after the secondary contact tracing (the contacts of primary contact of COVID19 patient) of positive patients admitted to the

institute. The daily reporting of the number of cases and contacts, along with the constraints faced by team were discussed every day at 9:00 am on online zoom platform. The presentations by team members can also be shared through 'shared screen' mechanism. To prevent the spread of infection, social distancing was encouraged wherein a WhatsApp group was created for the exchange of information within the team. The important documents, guidelines and best practices at national and sub national level were shared in the group for keeping them updated on the highly dynamic scenario. Towards the end of the day, the team members share the daily report which was also discussed online before its final submission to the Head of the Institute. However, as Government of India restricted the usage of Zoom application due to confidentiality and data leakage issues, we shifted our platform to Skype. The team members not only developed skills in usage of various online platforms, but also maintained social distancing while timely and efficiently developing reporting mechanisms for secondary contact tracing.

**Tele consultation service:** The residents of department were posted in the service areas located in outskirts of Chandigarh who shifted to tele consultation service during COVID 19 pandemic. Giving the example of Public Health Service in Health and Wellness Centre, Sector 49 a package of tele-health services were delivered for primary health care with special consideration to COVID-19 Pandemic which included topics related to hygiene and safety practices to be followed during COVID-19 pandemic, consultation regarding COVID-19 testing, home quarantine, home isolation and referral facilities, care during pregnancy and lactation period, counseling regarding family planning, abortion services, immunization of mothers and children, minor ailments, prevention and management of non-communicable, emergency and referral services. A dedicated helpline number was run every day for 4 hours and service was provided by Medical Officer/Resident doctors on duty.

## Conclusion

The choices we make today will reflect our upcoming future. Though it is a known fact that students learn best through face to face interaction and hands-on practice but it wouldn't have been possible during the COVID-19 pandemic. The critically thinking during the COVID provided an opportunity to

harness online platforms for uninterrupted teaching, training, research and service delivery. The online platforms have not only helped in maximizing the potential of learning but also saved time, money and other resources. Digital approaches to health care delivery have emerged as a promising option for advancing teaching, training and service delivery in pandemic times such as 'new normal' COVID19 era.

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**Tables****TABLE 1 WEBINARS CONDUCTED DURING COVID 19 PANDEMIC BY THE DEPARTMENT**

Name of online event	Number
Mental strength and stress management during COVID-19 Pandemic-Guidelines and precautions to be followed while working from home	1
Epidemiology, prevention and control of COVID-19	1
Women empowerment for COVID-19	1
Training of Librarian for COVID-19	1
Preparedness and Management of Maternal, Neonatal, Reproductive and Mental Health in COVID 19 Pandemic Situation	10
Managing COVID 19 Pandemic – Experience and Best Practices of India-Trained middle and senior Health care professionals from SAARC countries	3
Tobacco and Nicotine use in COVID 19 pandemic	1
Tobacco cessation during COVID pandemic and beyond, a need and opportunity”	1
Hypertension & COVID “ Role of Yoga in COVID Management”	1

**TABLE 2 LIST OF RESEARCH ARTICLES DEVELOPED DURING THE PANDEMIC**

Research articles
1. Impact of COVID-19 pandemic on routine immunization of under-5 children. (Commentary)
2. COVID 19: Behavior indiscretion is what caused it; behavior change can prevent and control it
3. Client cum domain segmentation approach for sustaining essential commodities supply system in Indian states/UTs under lockdown due to COVID-19 pandemic
4. Digital yoga interventions in social distancing era
5. Behavioral changes can be engineered after all –as a package deal in the wake of COVID 19
6. A friend in need is a friend indeed: Mitra E Clinics- rose to occasion during corona crisis lockdown
7. Establishing ‘e-knee school’ for patients suffering from knee osteoarthritis during COVID 19
8. Time to go back to our traditional way of greeting -‘Salaam-Namastey-Sat Sri Akal’ to ward off infections: An example from India
9. COVID 19 pandemic situation imperatives- Preliminary comparison of user friendliness & acceptability of various tele-health available mobile applications in urban/rural India
10. How effective is the virtual primary healthcare centers? An experience from rural India
11. Utilizing information technology-enabled self-care modalities for solving fitness issues of pregnant/ lactating women during corona pandemic related lockdowns
12. A randomized control trial to assess the effectiveness of a mobile app based non-surgical nursing management to improve selected outcomes among knee osteoarthritis patients attending physiotherapy OPD, PGIMER, Chandigarh, 2018– 20
13. Can “Gurudwara-Model” work for Covid-19 quarantine?
14. Novel coronavirus pandemic may worsen existing global non communicable disease crisis
15. Aspects of COVID-19: Child health, research in low and middle income countries, use of preventive measures <ul style="list-style-type: none"> <li>• The use of facemasks by the general population to prevent transmission of Covid-19 infection: A systematic review</li> <li>• Protecting children in low-income and middle-income countries from COVID-19</li> <li>• Need for COVID-19 research in low- and middle-income countries</li> </ul>
16. Corona By Products- Converting crisis into opportunities: Harnessing online platforms in public health practice and education
17. COVID-19 lockdown and NO2 concentration over India using satellite based data
18. Impact of COVID-19 lockdown on ambient air quality in megacities of India
19. COVID-19 pandemic: What can we learn for better air quality and human health?
20. Rapid preparation of hand sanitizer using WHO formulation in hospital settings during restricted supply due to COVID-19 pandemic
21. Higher body mass index is an important risk factor in COVID-19 patients: A systematic review and meta-analysis
22. Consideration for the asymptomatic transmission of COVID-19: Systematic review and meta-analysis
23. Nutritional effects on ACEIs: Is it enhancing the risk for COVID-19?
24. Unsung heroes in managing COVID-19 pandemic in India: The changed role of security guards in hospitals

25. “Unrecognized roles of nursing professionals and midwives in mitigating COVID-19 pandemic across all spectrum of continuum of care”
26. Challenges and way ahead of resuming non-communicable disease services and geriatric clinic post lockdown in India
27. Airborne transmission and ventilation: Analytical determinants in COVID-19 pandemic
28. Challenges and way ahead of resuming routine childhood immunization services at health sub-centre level post lockdown in India
29. The impact of social media on creating public awareness about COVID-19 in Chandigarh and Punjab

#### Research Proposals

1. Development, validation and evaluation of the impact of implementation of E-counseling based macro-micronutrient and lifestyle intervention programme on PCOS related signs/symptoms in adolescent girls of Chandigarh
2. Assessment of change in food habits during lockdown of adults/people of Chandigarh city
3. Evaluation of the impact of lockdown due to COVID-19 pandemic on quality of maternity (ante-/post-natal) care and pregnancy outcome in North India
4. Testing the feasibility and efficacy of an app/web based patient referral system for handling emergency obstetrics patients at a tertiary care Centre, PGIMER Chandigarh
5. Validation and pilot testing of information technology enabled home nursing care modalities in tricity Chandigarh adopting a life cycle approach
6. Sero-prevalence of anti-SARS-CoV-2 IgG antibodies in Chandigarh, India: a population-based cross sectional study
7. Sero-prevalence of anti-SARS-CoV-2 IgG antibodies in Haryana, India: A population-based cross sectional study
8. Implementing paperless official communication campaign to reduce the chances of spread of coronavirus
9. Impact of online yoga sessions and yogic diet on immunity and stress levels of resident doctors and HCWs
10. Effect of a multi-sectoral, technology-enabled, community based, health & risk communication on COVID-19 (MuSTeC-COVID): A comprehensive participative model for rural areas of northern India.
11. Rapid Assessment of community preparedness against COVID-19 (RACP-COVID-19): A cross-sectional study from Northern India
12. Access to healthcare services and disease control status, among patients with Non-Communicable disease during COVID 19 lockdown and feasibility of establishing a telemedicine services: A pilot study from Haryana
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15. Biosensor Development for COVID-19 Diagnosis
16. Comprehensive epidemiological assessment and action plan for prevention and control of COVID-19 in various CHSP areas of PGIMER, Chandigarh
17. Tele-screening, consultation and follow up for SARS CoV-2 (COVID19)-A community-based initiative for COVID19 pandemic
18. Assessment of patient flow, satisfaction of patients utilizing tele-consultation services during COVID-19 pandemic in PGIMER, Chandigarh
19. Growth of COVID-19 across Indian states and union territories and its dependence on associated factors: A comparative study using panel data modeling
20. Community perception, and preferences of COVID-19 vaccine
21. Assessment of intention to uptake the COVID-19 vaccine among population in India: A web-based national survey
22. Determinants of COVID-19 vaccine acceptance: A systematic review and meta-analysis