

Online webinars a new learning solution in the pandemic times: An evaluation of AFOMP initiative of monthly webinar series

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Abstract— The COVID-19 pandemic has been a major challenge in all sectors of our society especially education and training. Regulations related to social distancing and social mobility has led to significant reduction in extracurricular learning and training activities. Learning activities on digital platforms has greatly improved widely accepted as a result. The year 2020 and 2021 has seen testing of new virtual educational approaches in all phases of education worldwide and proved to be effective in the pandemic times. World has seen newer solutions and opportunities. Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) formed on 28th May 2000 with an objective of development of medical physics profession in Asia-Oceania region, to celebrate its 20th anniversary year decided to have a series of monthly webinars on a commercial virtual platform to mark teamwork and cooperation for sustainable growth of medical physics in this region. These webinars were a great success despite the time zone differences for participants from not only the Asia Oceania but also across the globe. Though, it was planned to be organized on every first Thursday of the months of the 20th anniversary year, May 2020- May 2021, considering the enthusiastic responses and eager wish to have more of these from the participants especially the young medical physics professionals AFOMP decided to continue these monthly webinars. The first webinar was on 5th June 2020 and the 13th is scheduled to be on 3rd June 2021. This article discusses in detail about the impact and lessons learned from these monthly webinars at this testing times of COVID-19 pandemic.

Keywords—Webinar, Survey, AFOMP, Medical Physics Education, COVID-19 Pandemic.

I. INTRODUCTION

The impact of COVID-19 is observed in all quarters across the globe. The different sectors of education in all countries of Asia Oceania as well as the rest of the world are severely affected. The worldwide lockdown imparted acute effects on routine life as a whole. Learners stopped to go to schools/ colleges and all physical educational activities halted across the world [1]. The educational institutions were pushed forward to grow and option for methods utilizing advanced new technologies, which have not been used/ popular before. To wash away the serious threat on education, the stake holders in the sector has been fighting to survive the crises with different approaches and digitizing was the answer.

The pandemic COVID-19 has rapidly spread over whole world and urged everyone to maintain social distancing. It disrupted the education sector significantly which is a crucial determinant of any country's economic ensuing. COVID-19 was first reported in Wuhan, China on 11th January 2020 [2]. The name COVID-19 was proposed by the World Health Organization (WHO) on 11th February 2020. The first case of the COVID-19 pandemic in the second largest population in Asia Oceania, India was reported on 30th January 2020 in the State of Kerala and the affected has a travel history from Wuhan, China.

The COVID-19 pandemic has affected countries and territories worldwide with a huge impact on the lives of millions of people. While countries are at different points in their COVID-19 infection rates, education sector is heavily affected by the closure of learning institutions, to slow its spread. The global academic calendar has been in a state of disarray by the pandemic outbreaks [3]. Schools and universities from basic to advanced education halted their regular physical classes and students have return to their natives for social isolation. As a result of this, higher learning institutions have been pushed into experimenting Electronic learning (E-learning) in an unprecedented scale. E-learning is defined as the use of computer network technology, primarily over or through the internet, to deliver information and instructions to individuals [4].

The adoption of digital technology was accelerated by lockdown adopted worldwide. Development of new and improved professional skills/ knowledge resulted through more efficient and productive online learning. It is a fact that technology-based education is more transparent in all respects. The expertise and exposure to information and communications technology of both educators and the learners have significant role in the selection of appropriate pedagogy for online education.

Medical physics uses physics principles, methods and techniques in practice and research for the prevention, diagnosis and treatment of diseases varying from simple physiological or morphological abnormalities to cancer with the specific goal of improving health and well-being. Radiation Oncology Physics, Medical Imaging Physics, Nuclear Medicine Physics Medical Health Physics (Radiation Protection in Medicine), Non-ionizing Medical Radiation Physics, and Physiological Measurements include the vast spectrum of medical physics practice. It is also

closely linked to neighboring sciences such as Biophysics, Biological Physics, and Health Physics [5].

Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) was formed on 28th May 2000 with an objective of development of medical physics profession in Asia-Oceania region. AFOMP has made notable milestones such as regularizing annual conference AOCMP, newsletter, journals, oration, awards, and policy statements with support of each member of AFOMP. In two decades, seven teams of AFOMP Executive committees, which include President, Vice President Secretary General, Treasurer, and Committee Chairs have provided leadership, guidance and served for the betterment of organization and profession [6-8].

The co-operation and communication among medical physics organizations in the region, medical physics related activities, status, and standard of practice of the profession were all improved and upheld in the last two decades by means of organization or sponsorship of regional/international conferences, collaboration/ affiliation with scientific organizations and so on [8].

During the pandemic, the health services needed to be continued and therefore medical physicist also contributed hugely to tackle the pandemic during COVID [9]. The Radiotherapy facility, Radio Diagnosis, Nuclear Medicine, Radiation safety, QA, QC, education, and training continued with greater challenges than usual. AFOMP also took many steps to keep the education training, dissemination of knowledge and the technology has helped in this endeavor [9-11]. AFOMP started monthly virtual webinars for the benefit of medical physicist as most of the conference either are postponed or canceled. However, the 20th AOCMP was held at Phuket Thailand in hybrid mode that is virtual as well as in person.

AFOMP has brought out guidelines for the medical physicist in radiotherapy for the radiotherapy services and guidelines for Radiological imaging for radiological imaging staff and are available on the AFOMP website. To encourage publication of research articles in AFOMP official Journals, AFOMP has started AFOMP best publication award.

II. MATERIALS AND METHODS

Asia-Oceania Federation of Organizations for Medical Physics (AFOMP) was established in 2000 (www.afomp.org) for encouragement of co-operation among national Medical Physicist organization of the IOMP (www.iomp.org). Today AFOMP has 21 countries as members and last 20 years AFOMP has tried to afflict medical physics education and profession in this region. AFOMP has started lifetime achievement award, best publication ward traveling grants to young medical physicist. AFOMP is trying to increase its activities for benefit of

young Medical Physicist in the region and planning some more awards like young Medical Physics Innovation Award, Best research award etc. to sustain and to recognize the contribution of medical physics and radiation safety.

The study was a cross-sectional survey based on a web-based questionnaire carried out among medical physicist who attended the AFOMP monthly webinar. The web-based questionnaire was prepared based on the experience of the participants who was attending the AFOMP webinar in COVID-19 pandemic.

The survey comprised a total of 26 questions. The survey was composed of questions adapted to evaluate awareness and understanding level of participants during webinar. We used Google Forms, a web-based survey method to create as well as to distribute the questionnaire. An online Google form questionnaire link was shared with different in various social media platforms (WhatsApp messaging software, AFOMP Website, Face Book, Gmail etc). All the participants and researchers were asked to answer the questionnaire for a survey purpose. Participants were also asked to share the questionnaire link among their colleagues; therefore, the questionnaire could reach many participants. The final questionnaire for this study consisted of 26 questions. The questions include the common problems encountered in the online webinar, and suggestions to improve the online webinar. The questionnaire consisted of 24 multiple-choice questions and two short answer questions.

Consent was obtained from all the 107 participants. No personal or demographic information was collected in the study. Data collection was done using a Spreadsheet linked to the online Google form questionnaire. The responses were collected as Excel sheets and analyzed. Data collection was done during the period 10th February to 31st March 2021.

III. RESULTS

A total of 107 responses were obtained. Participants from 28 countries contributed to this survey. 26 participants were from India (24.3%), 11 (10.3%) participants from Malaysia, and 6 (5.6%) from Taiwan. The other countries participated in the AFOMP survey were South Africa, Morocco, Iran, Africa, Sudan, Japan, Nepal, Philippines, Syria, Bangladesh, Philippines, Singapore, Indonesia, Australia, Turkey, México, Thailand, Mongolia, USA, HKSAR, Pakistan, Morocco, France, China, and Ireland (Fig.1).

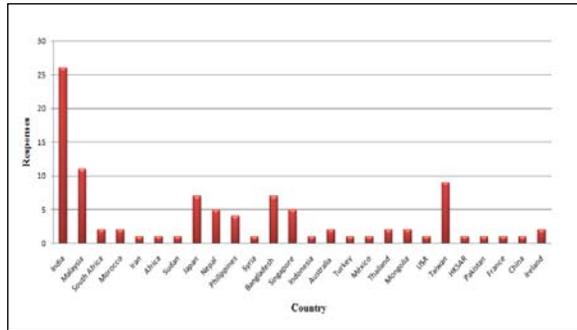


Table 1 Analysis of the questionnaire responses on individual details
Fig.1 Country wise participation in the survey

The age of participants ranged from <25 to >45 years. About 13.1% of the participants were aged <25 years, 33.6% were aged 25–35 years, 25.2% were Aged 35–45 years, and 28% were aged >45 (Fig.2).

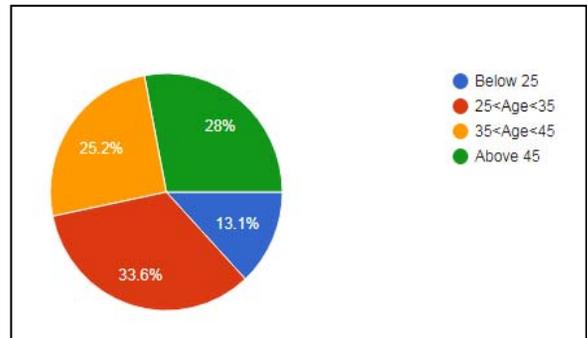


Fig.2 Age group of the participants

Out of the 107 participants, 63 (59.8%) were males, and 43 (40.2%) were females

Demographic Profile N=107			
		N	%
Gender	Male	63	59.8
	Female	43	40.2
Designation	Student medical physicist	24	23.1
	Clinical medical physicist	39	36.1
	Faculty medical physicist	24	23.1
	other	20	18.7
Specialization	Radio diagnosis	9	8.4
	Nuclear medicine	2	1.9
	Radiotherapy	65	59.8
	All three	19	17.8
	other	13	12.1
How do you come to know about AFOMP Webinar?	AFOMP Website	25	23.4
	IOMP Website	6	5.6
	E-Mail	35	31.8
	Social media	5	4.7
	From colleagues and friends	27	26.2
	others	9	8.4
How many AFOMP webinar you have attended?	All	35	33.3
	Few	69	63.9
	None	3	2.8
How do you find webinar subjects?	Relevant	104	96.3
	Non relevant	4	3.7
Should AFOMP webinars continued after COVID-19?	Continued	92	86
	Discontinued	2	1.9
	Continued with changes	9	8.4
	If continued with changes, please specify	4	3.7

(Table1).

Most of the participants were clinical medical physicist (36.1%). About 23.1% of the participants were student medical physicist and faculty medical physicist. The other category includes almost about 18.7 % (Table 1).

It was seen that almost 59.8% of the study participants were from radiation therapy followed by around 8.4% from diagnostic radiology, around 1.9% from nuclear medicine department, 17.8% (18) from all three departments (radiotherapy, radio diagnosis and NM) and 12.1% from other departments (Table 1).

A good number of the participants (31.8%) came to know about AFOMP webinar through email. This was followed by 26.2% from colleagues and friends, 23.4% through AFOMP website, 5.6% from IOMP website, 4.7% from social media and 8.4% from other resources (Table 1)

Out of 107 responses 33.3% participants are attended all the AFOMP Webinar.63.9% attended few of them and rest all are not attended any of them (Table 1).

The study also revealed that 96.3% participants find the AFOMP webinar subjects are relevant and 3.7 % find the subjects are not relevant for them (Table 1).

A total of 86% (92) of participants said that the AFOMP webinar should be continued after COVID-19. 8.4% (9) participants said that continue the webinar with changes. Very few participants said that the AFOMP webinar should discontinue (Table 1).

Half of the participants requested that the subjects of the webinar to be more application based (50.5%). 25.2% of the participants requested that the subjects should be advanced, 15.9 % said that subjects should be researched based and only 8.4% participants responded for basic (Fig 3).

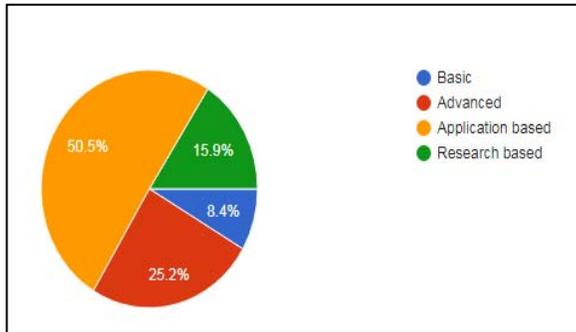


Fig.3 Requirement for the subjects of webinars

Challenges faced during webinar was given internet connectivity, device or equipment, time constraint, demanding workload and other ommitments.30.8% participants said that internet connectivity,28% for demanding workload ,18.7% for time constraint,17.8% for other commitments and 4.7% for device or equipment (Fig 4).

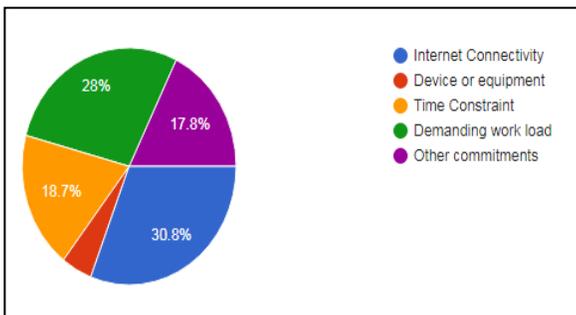


Fig.4 Challenges faced during webinar?

Almost 62.6% participants are requested to add more webinar subjects related to radiotherapy.19.6% for radio diagnosis, 11.2% for nuclear medicine and rest for other topics (Fig.5).

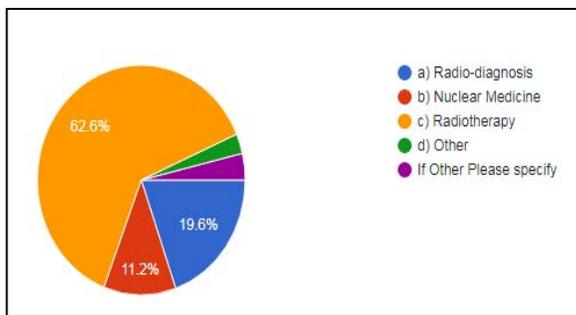


Fig.5 Further requirement of webinar subjects

For the time duration of AFOMP webinar, majority of 72.9% participants responded for remaining same, 22.4% responded for increasing time and 4.7 for decreasing time. (Fig.6)

56.1% of participants said that the frequency of AFOMP monthly webinar should be same, 40.2% said that frequency should be increased and 3.7% responded for decrease (Fig.6).

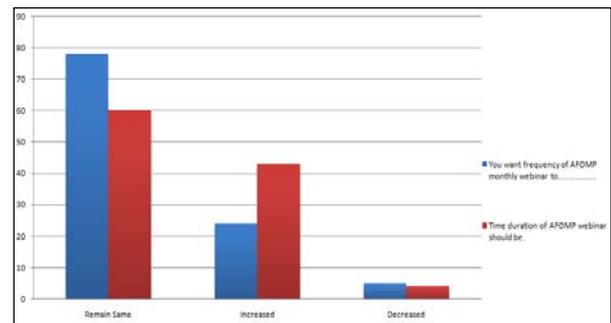


Fig.6 Responses on the time duration and frequency of AFOMP monthly webinar

The majority of the participants said that the AFOMP webinar timing are suitable for their country time zone (88.8%).11.2% responded that the timing is unsuitable for their country time zone. (Table 2)

Almost 72% of the participants found that the video and audio quality of webinar was good, and 28 % participants said that the audio video quality was average. (Table 2)

Table 2 Analysis of the questionnaire responses on webinar details and requirements

Demographic Profile N=107			
		N	%
Suitability of AFOMP webinar timings to your country time zone	Suitable	95	88.8
	Un-suitable	12	11.2
Video and audio quality of webinars	Good	77	72
	Average	30	28
	Below average	0	0
Devices/equipment used for attending webinars.	Laptop	48	44.9
	Smart phone	32	29.9
	Desktop	23	21.5
	Tablet	4	3.7
	Yes	98	90.7

Is recorded AFOMP webinar video on AFOMP website is easily accessible and useful?	No	6	5.6
	If no, specify	0	0

Data showed that participants used several electronic devices to attend webinar. The most used device was the laptop (44.9%) followed by Smartphone (29.9%) and desktop (21.5%), while the least used device (3.7%) was the tablet (Table 2).

A good number of participants (90.7%) were satisfied with the accessibility and use of pre-recorded video on AFOMP website and 5.6% felt that the accessibility and use of pre-recorded video was not good (Table 2).

It was found that the overall rating for the AFOMP webinar series, 51.4% of participants have given excellent, 44.9% has given good and 3.7 responded for average (Fig7).

Our data showed that for 61.3 % of participants are given excellent for the speaker’s expertise of subjects and 34% of participants are given well for their subject expertise. Only 4.7% are given average (Fig7).

A good number of participants (47.2%) were satisfied with the Quality and flow of the webinar talks and 48.1 % felt that the clarity and flow of the webinar talks was good.38% responded for average quality (Fig7).

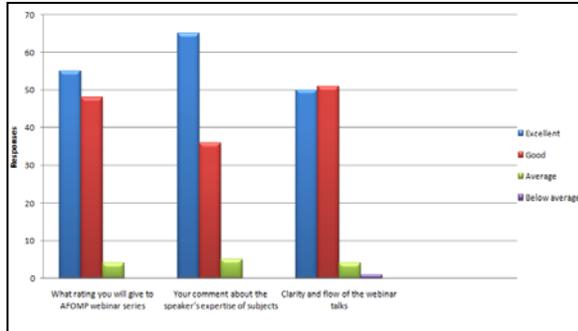


Fig.7 Rating to AFOMP webinar series based on speaker’s expertise of subjects, clarity, and flow of the webinar talks.

84.1% of the respondents reported that the question-and-answer time during the webinar was sufficient.15.9% reported that the time was insufficient for them. (Fig.8)

For the use of AFOMP webinar software application, 97.2 % participants responded that application was easy to use, and 2.8% participants said that application was not easy to use. (Fig.8)

Data showed that for 96.3% of participants the AFOMP webinar are helped for knowledge up gradation through e learning duding COVID-19 and 3.7% participants responded no. (Fig.8)

From all 107 responses 69(63.6%) participants are from AFOMP region and 43 (36.4%) participants are from out of AFOMP region. (Fig.8)

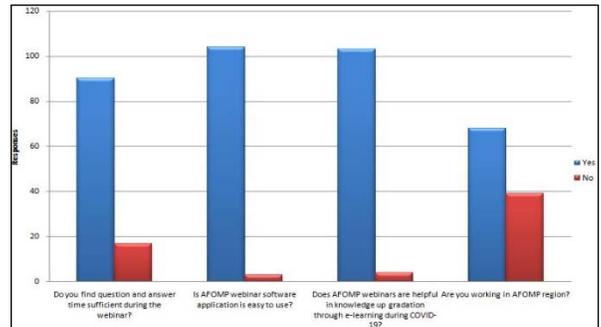


Fig. 8 Responses on ease of accessibility and usefulness of AFOMP webinar video on AFOMP website and AFOMP webinar software

Recommendations to Improve Online Learning in AFOMP webinar.

The participant’s recommendations regarding improvement of the online webinar were summarized as change the timing of seminar; continue the excellent work in future, background noise from participants should be addressed before the webinar begins, more free fundamental webinar ,ZOOM Webinar is better than ZOOM meeting, conduct next webinar subject related also to calibration procedure for equipment in diagnostic radiology & nuclear medicine, proton measurement, AAPM TG 43, Low dose radiation effects and LNT hypothesis, good initiative to support medical physics, give sample time for the question and answer portion, organization committee is very cooperative and expert, it is very attractive to provide training from the Asia-Oceania region, focus some course work virtually to students for transfer of knowledge related IMRT, VMAT, Gamma knife and quality assurance and protection, more time for Q&A session since many people join the webinar every time, provide hard copy of lecture , this webinar should continue with more to application and advanced topic on medical physics, the AFOMP should increase the pragmatic and research webinar. Conduct more training programmes in physical as well as virtual modes, reduce the webinar duration to 30 min per session, very nice and should be continued, include more practical based stuff that will help in daily routine, kindly include veracity of topics, continue after COVID-19, please provide some certificate-based lecture where we can give exam after lecture and able to get certificate.

IV.DISCUSSION

Genuine and periodic assessments and feedback are essential components of effective e-learning. Availability of helpful formative assessments and timely feedback are very crucial to the continuous progress of online learners. There are varieties of online infrastructure that have been prepared by many educational firms and made free for learning during this pandemic. The affordability and accessibility to these online infrastructures for all the learners of varied economic backgrounds are still a challenge. COVID-19 has brought many changes to the practice of radiation physics and day to day social life. This pandemic has allowed us the opportunity to reevaluate the way we practice, the way we add value to our field, the way we promote our importance, and the way we adapt using technology in a field that is arguably more comfortable and reliant on cutting edge technological innovation than most fields including those within medicine.

Our data showed that 107 participants from 26 countries answered the questionnaire; Participants were 59.8 % males and 40.2% females, respectively. These findings also show that gender was not a factor about E-learning because both female and male participants were knowledgeable about it. Similar results were found by [1, 12-13] "COVID-19 and E-learning: Perception of Freshmen Level Physics Students at Lusaka Apex Medical University" [1] also indicated that there is no difference between male and female students which each of them is aware of the E-learning system in their study life.

The current study showed that the most popular device that participants used to access the online webinar was the laptop followed by Smartphone, while the least used tool was the Tablet. This is in agreement with previous studies [4, 14-16]. The most common problems associated with online webinar in general included the availability of internet connectivity, demanding workload, time constraint, device or equipment, and other commitments. A good number of participants (90.7%) were satisfied with the accessibility and use of pre-recorded video on AFOMP website and 5.6% felt that the accessibility and use of pre-recorded video was not good. Similar results were found by [14]. The pre-recorded videos were very clear and helped them in their lessons for about 64% (7/11). The majority of the participants were between 20-24 years old; and the majority of the participants were specialized in radiotherapy followed by specialized in other three departments radiotherapy, radio diagnosis, and nuclear medicine.

Good number of the participants (78.4%) came to know about webinar through email and from colleges and friends. Only 36% of the participants attended all the webinar and almost more than half of them attended few of them.

For most of the participants, the webinar subjects were relevant and help them for up gradation of knowledge through e learning. Majority of the participants said that the timings of the webinar were suitable for their country zone

and continue the webinar after the COVID-19 pandemic. Half of the participants want the subjects of the webinar related to radiotherapy and should be more application based. For 97.2% participants, the AFOMP webinar software was easy to use and 84.1% responded that the question answer timings were sufficient during webinar. For more than half of the participants, the time duration of AFOMP webinar was suitable and perfect. Majority of the participants said that the frequency of the monthly webinar should be remaining same after the Covid-19 pandemic. The audio, video quality of the webinar was good for most of the participants and recorded video was easily accessible for them.

To improve online education in general it is recommended to change the timings of the webinar, control the background noise from the participants during the webinar, include the webinar subjects related to calibration procedure for equipment in diagnostic radiology and nuclear medicine, proton measurement, AAPM TG 43, Low dose radiation effects and LNT hypothesis. Also, many participants requested that conduct some course work virtually to students to transfer the knowledge related to IMRT, gamma knife, Quality Assurance, and protection. Also Include more practical based stuff that will help in daily routine and provide some certificate-based lecture where we can give exam after lecture and able to get certificate.

V. CONCLUSION

The emergence of COVID-19 pushed education to adopt into E-learning. Though the education sector was impacted immensely and created many challenges, various opportunities are also evolved. The academic performances of most participants were affected to varying degrees by the pandemic induced lockdown. An opportunity for self-study is an important advantage of online education. This study has provided a situational analysis of the quality and effectiveness of AFOMP monthly webinar in medical physics due to the impact of the COVID-19. There are minor challenges in implementing E-learning monthly webinar lessons such as access and connectivity of internet, workload etc. However, majority of the participants are satisfied with all AFOMP webinars and they are expecting that the webinar should continue after the pandemic. From 26 countries, almost all of the participants said that the AFOMP monthly webinar performance and coordination is good and webinar subjects were relevant.

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