



IMPACT OF ONLINE TOXICOLOGY CME AMONG MEDICAL FRATERNITY- AN OVERVIEW OF FEEDBACK

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Abstract

Background: - In pandemic times, Webinars have been indispensable for Continuing Medical Education (CME) in every field of medical science, including Toxicology. The present survey evaluates participants' perceptions of the webinar on toxicology (**WebT**), considering the recent trends and future requirements.

Methods- The present survey is conducted as a cross-sectional study comprising web-based 13-questions, conducted by the Department of Forensic Medicine & Toxicology, Kalinga Institute of Medical Sciences, Bhubaneswar on, 18th December 2021. After the WebT, participants were identified through the WhatsApp number and Email Ids provided during registration.

Results: 103 participants responded with a response rate of 39.54%. The propelling factor for attending WebT was scientific content (33%), followed by an award of CME credit points. Among the participants, 48% agreed that WebT could replace traditional CMEs, whereas 20% were at the end of disagreement. About 10% of participants described connectivity and audio quality issues as a significant bottleneck.

Conclusion: Web T provides safety, besides the convenience of saving work-time. Effectiveness and acceptance are encouraging and can further be improved by choosing recently trending Web T topics, awarding Credit points and educating participants to counter the possible technical glitches.

Keywords: - Webinar on Toxicology, Connectivity issues, Continued Medical Education.

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Introduction:

In the scenario of COVID-19 pandemic, a shift from face-to-face interaction to online continuing medical education (CME) events is being promoted. Continuing medical education (CME) and workshops go a long way to update and refresh medical education and help them stay updated about the latest advances in the medical field, which allows them to impart the latest and better treatment to the patients.⁽¹⁾ The American Medical Association (AMA) presently defines continuing medical education (CME) as educational activities that serve to maintain, develop, or increase the knowledge, skills, performance, and relationships a physician uses to provide services for patients and the public or the profession.⁽²⁾ Online CME seems to be a growing area, attracting increasing resources, time and attention among healthcare professionals who increasingly consume education delivered through digital channels.⁽³⁾

Technology has made interactivity, personalization, and tracking of learning more accessible and more impactful. Digital platforms reach more learners at once and allow self-paced, on-demand education, where in-person sessions remain bound by location and time. In the process, they transform the experience and quality of CME.⁽⁴⁾ CME providers sponsor various activities, such as courses, regularly scheduled series, or enduring materials, defined as instructional materials that can be accessed at a time chosen by the participant. Researchers like Wong et al., 2017⁽⁵⁾ have reported the positive impact of online training in toxicology to bridge the knowledge gap and change in practice between developed and developing countries through their experience in the Global Educational Toxicology Uniting Project (GETUP).

Despite evaluating a wide range of CME interventions targeted at improving professional practice and patient outcomes⁽⁶⁾, evidence of the benefit of online CME is limited. Therefore, there is a professional and ethical obligation to ensure all CME interventions are evaluated for their quality, effectiveness, and cost-effectiveness. The present article aims to find out the participant's feedback regarding the effectiveness of the webinar in toxicology learning in terms of the overview of the knowledge gained and participants' experience immediately after the CME program.

Material and methods:

The study was conducted as an internet-based cross-sectional study. An online seminar was planned for the 18th of December 2022 after obtaining due permission from institutional authorities as well as the State Medical council following confirmation of the names of the speakers and the topics to be discussed. A soft copy of the flyers was distributed in social media groups with a web link for online free registration. All the speakers and the participants were kept updated about the details of the online seminar with the help of a WhatsApp group. A zoom link was shared with frequent reminders of the date and time of the webinar in this group. 263 participants attended the webinar on the due date and time. After completing the webinar, a link to participate in a feedback survey was sent to all the participants by email.

The online survey with the heading "Feedback and Suggestion for Toxicology CME held on December 18th, 2021" was responded to in google forms by 104 participants. Participant particulars like age, sex, years of practice post-registration, and the average number of online seminars attended per month in the past six months and one year were asked.

Candidates were asked about the average; number and percentage of webinars or online meetings they attend compared to the numbers they were invited to? They further were asked about the factors that enhanced their interest in attending Online CME, with options being- topic /scientific content, CME credit hours by Medical council, speaker's name and experience, and personal relationship with organizers. The participants were asked – 'As far as the topic of Toxicology is concerned- Can the Online CME replace in-person meetings?' The responses were presented on the Likert scale as strongly disagree, disagree, neutral, agree, and strongly disagree. Further, the participant's feedback was sorted regarding the toxicology topic they wanted to attend, with options being –Drug overdose, Antidotes, General Toxicology and How to set up a Poison Control Center. Following this, the participants were asked two open-ended questions – one regarding any other topic of toxicology that they wanted to attend and the second question being any suggestion they would like to give to improve the Online Seminar. The participants were asked if they needed the pdf format of the presentations, and if yes, they should provide any mail ID they wanted it to be sent to. The entire feedback

response was automatically recorded and tabulated as graphs and excels sheets in google forms. The data was analyzed by a statistician using standard statistical methods. The entire questionnaire of the survey is attached as an annexure with the article.

Results:

In the present study, 103 doctors (health care providers) responded to the questionnaire, of which 69(67%) were males, and 34 (33%) were females with $p = 0.086$. The mean age of the study participants was 34.59 ± 9.25 yrs. Apart from one participant, all the participants were from India scattered from different states. Among the online CME on toxicology participants, 49% were postgraduates, 14.4% were graduates, 33.8% were

MBBS students, and 7% were qualified DM/MCH/Ph.D. holders. Apart from MBBS and BHMS, the broad specialties participants found in our study in decreasing frequency belonged to Forensic medicine and Toxicology (41%), Emergency Medicine (22%), Critical Care Medicine (7%), besides others like General Medicine & Community Medicine. The health care providers had a general practice experience of 10.6 ± 7 years. On average, the participants attended about 3 online webinars in the past six months, which was higher than the average number (2.8) that the respondents attended during the past year. Among the participants, 76.7% were attendees of the webinar, while the rest participated as speakers. **(Table-1)**

Table1: Distribution of the survey respondents according to different parameters (n = 103)

Parameters	Value
Age (in completed years) Mean \pm SD Median (Min-Max)	34.59 \pm 9.25 20-68
Gender Male Female	69 (67%) 34(33%)
Years of Practice except for students (N=66) Mean \pm SD Median (Min-Max)	10.6 \pm 7.0001 2-42
How many webinars or online meetings, on average, have you attended per month during the past 6 months? Mean \pm SD Median (Min-Max)	3.11 \pm 1.8 0-9
How many webinars or online meetings, on average, have you attended per month during the past 1 year? Mean \pm SD Median (Min-Max)	2.83 \pm 2.1 0-10
What is your role in webinars and online meetings? Equally speaker and attendee Mostly attendee Mostly speaker	23 (22.3%) 79 (76.7%) 01 (1.0%)
On average, what is the percentage of webinars or online meetings you attend compared to the number you are invited to? < 25% 25-50% 51-75%>75%	11(10.7%) 27(26.2%) 34 (33%) 31(30.1%)

The most important driving factor is the topics/scientific content of the CME, which is the highest among the respondents (33%). It was the most common attending reason when considered

singly to the CME. The topic and the CME credit points were the second most important cause of attendance in this CME. The credit points was obtained from the Odisha state medical registration council. **(Table-2)**

Table 2: Factors that enhance interest for attending online CME (Table-2)

Factors that strengthen interest in attending online CME	Frequency	Percentage
CME certification with credit hours by Medical council (A)	12	11.7
Speaker's name and experience (B)	1	1.0
Topics/ Scientific content (C)	34	33.0
Personal relations with organizers (D)	0	0
Topics/ Scientific content, CME certification with credit hours by Medical council (A+C)	14	13.6
Topics/ Scientific content, CME certification with credit hours by Medical council, personal relations with organizers (A+C+D)	4	3.9
Topics/ Scientific content, CME certification with credit hours by Medical council, Speaker's name and experience (A+B+C)	18	17.5
Topics/ Scientific content, CME certification with credit hours by Medical council, Speaker's name and experience, personal relations with organizers (A+B+C+D)	10	9.7
Topics/ Scientific content, Speaker's name, and experience (B+C)	8	7.8
Topics/ Scientific content, Speaker's name and experience, personal relations with organizers (B+C+D)	2	1.9
Total	103	100.0

When considering online webinars in toxicology, most participants (34%) agreed that the online webinars could replace the previous modality of in-person (off-line) CMEs, while another 13.6% of participants had strongly agreed to the above statement beyond any doubt. Only about 19.4% of participants did not agree with the online format

of CMEs, while 32% of participants stayed neutral towards the replacement viewpoint on the topic. There was no significant difference of opinion regarding the value of online/ in-person meetings (offline) among different types of participants (primarily speakers/ attendees/ equally speaker and attendees) with a p-value of 0.28.(**Table-3**)

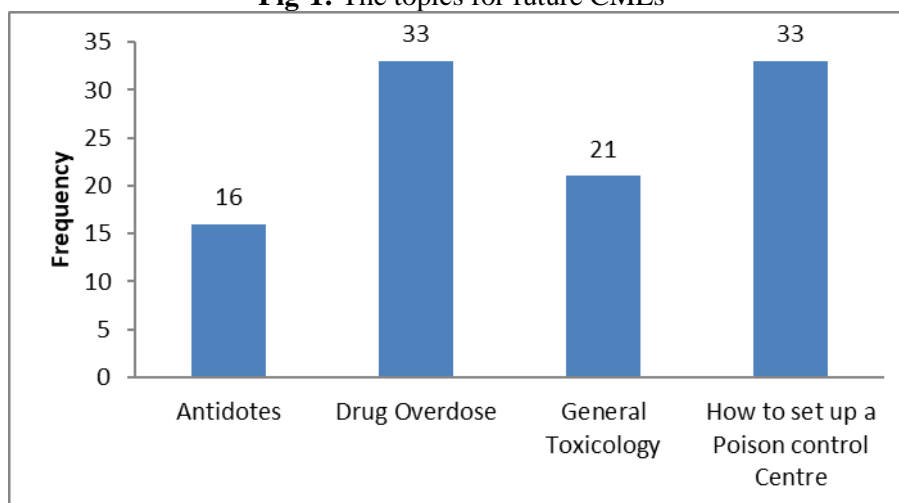
Table 3- Agreement towards online webinars in toxicology to replace an in-person meeting.

Online webinars can replace in-person meetings for toxicology	Number	% age total
Agree	35	34.0
Disagree	20	19.4
Neutral	33	32.0
Strongly agree	14	13.6
Strongly Disagree	1	1.0
Total	103	100.0

Since the topics of CMEs were the most crucial factor, which drives a larger audience towards attending. We tried to understand the most exciting topics/issues for future webinars or

offline CMEs. The most common response in topics of interest was setting up a poison control Centre 33 (32%). and approach to addressing drug overdoses was 33 (32%). (**Fig1**)

Fig-1: The topics for future CMEs



The most common issue the participants faced during the CME for which they suggested

improvement was the audio quality.

Discussion:

During the current crisis of covid-19, there has been a significant disruption of education, including medical education, thus giving rise to the virtual platforms for the same. These platforms will likely persist in the future, even after the pandemic scare. There is still a lack of parameters to look into the quality of education and interaction this method imparts. The present study tries to look into online platforms in toxicology and assess the future trends and requirements as perceived by the attendees. The study has a survey response rate of 39.54%, in contrast to that reported by Al-Ahmari et al., 2021.⁽⁷⁾ In the present study, males outnumbered females (67% Vs. 33%), the mean years of practice experience was 10.6 +/- 7 yrs. These data agree with that published by Shah et al., 2017⁽⁸⁾ when the above two parameters are concerned.

In the present study, the respondents' average number of webinars attended was higher in the last 6 months (3.0) than in the previous year (2.6). This agrees with the findings of Ismail et al., 2021.⁽⁹⁾ Even though there have been no lockdown restrictions in our region, the participants prefer to attend in the online platform, and the trend will be increasingly used in the future.

About 65% of attendees attended more than 50% of the webinars they were invited to. This is in contrast to Ismail et al., 2021,⁽⁹⁾ who reported that the participants were overwhelmed with the number of webinars occurring and only attended 25% of invited webinars.

Interestingly, even in the pre-pandemic years, Shah et al., 2017⁽⁸⁾ in their study, reported that about 1/3rd (36%) of the participants preferred online CME in place of the traditional approach.

This highlighted the importance of added convenience of not traveling outstation for a CME.

In our study, the most important driving factor for attending the webinar was the CME's scientific content (33%), followed by the medical council's award of CME credit points (12%). A similar finding was also reported by Ismail et al., 2021.⁽⁹⁾ While the relationship with the organizers was the least preferred criteria by the participants in our study, it was in contrast to Shah et al., 2017,⁽⁸⁾ who reported that the hosts' reputation was considered superior to the allocation of credit hours.

48% of our study respondents agreed that webinars could effectively replace in-person CMEs in toxicology.

These findings were in contrast with other surveys by Figueroa et al., 2020,⁽¹⁰⁾ Al-Ahmari et al., 2021,⁽⁷⁾ and Ismail et al., 2021⁽⁹⁾ where around 60% of those who gave feedback believed that webinars should not replace face-to-face CMEs after the pandemic. Reasons cited for this dissatisfaction include the overwhelming number and frequency, lack of scheduling, increased screen time exposure, especially with shifting practice to telemedicine, technical difficulties, increased stress from either attending too many or too few webinars for fear of missing out on educational activities, in addition to disturbance of work/life balance, and zoom fatigue.

In our study, when an open-ended question sought the suggestion for quality improvement, 10% of participants described connectivity issues/internet disturbances poor audio quality as a significant bottleneck to the overall effectiveness of webinars.

A recent study published by Hofstädter-Thalmann et al., 2022⁽¹¹⁾ states that they did not believe that the 'five principles of effective learning' were compromised in any sense when the effectiveness of online CME was contrasted with that of face-to-face learning. However, it remains unclear in their study if they considered the overall quality of internet connectivity and audio-visual presentation on the receivers' end. We suggest that the online CME invitation flyers should provide a few of the tips to counter the issue of faulty connectivity and poor audio-visual output at the receivers' end, which can be summarized as stated in "Top Tips To Improve Audio Quality in Your Zoom Meetings | University IT," 2022⁽¹²⁾

- Using the right equipment like laptop built-in mic in place of computer mics.
- Using wired headphones preferably with active and passive noise cancellation as the Bluetooth headphones may pose an inherent delay compared to the wired ones besides having an additional need for keeping the Bluetooth devices charged appropriately.
- Internet connection should be strong to inhibit garbled voices and speech delays; connecting the devices to the Ethernet jack will provide a more stable connection than wireless connections. Moving closer to the router will do the trick if this is not feasible. Participants should ensure that a lot of internet bandwidth is not used up simultaneously by other connections when connecting from a shared connection. Participants should open only the necessary tabs and programs before joining

online CME. Disconnecting video can enhance sound effects in a narrow bandwidth internet connection.

Other suggestions as gathered from CME employing open-ended questions, which can come in handy to ensure audience concentration and interest are- Mandatory question(s) from each participant in the Chatbox which the speaker can further take up and best question awarded as well, pre & post-test quiz, using maximum 3 experts for a focused approach to one selected topic, using recorded presentations instead of live feed, providing pdf formats of presentations to participants, and hands-on training/workshops along with the CME. It is interesting to note that a few of the suggestions by our attendees were similar to the ones recommended in a survey published by Shah et al., 2017. ⁽⁸⁾

Lacunae of study:

The survey response rate of 40% could be considered as a limitation of the study; however, this could be increased by repeated reminders to fill the survey and to ensure that it is concise. This CME was concerned for Toxicology, and the ideas gained may not apply to other streams of Medical science.

Learning points from the study:

At present, CMEs in Toxicology by the online forum are acceptable to many practitioners and students and equally wished to stay even in post-pandemic times. The toxicology topic(s) of interest in this part of the world are drug overdoses and setting up a Poison control center. The significant bottlenecks to online CME(s) that can be easily prevented are connectivity issues and audio output at the receiver's end. The preventive measures can be communicated to the participants before the online CMEs.

Emergency medicine is an upcoming field in India and should be increasingly involved in the future toxicology CMEs.

Conclusion:

Digital platforms have changed the way people communicate and learn in every medical institution. As learners' comfort with computers and internet connectivity and computer access become the norm, CME must adopt digital platforms to augment the quantity and quality of learner engagement. Informed educators understand that the optimal learning mode depends on the content, context, and learner, and digital platforms offer flexibility and responsiveness to learners' needs, which drive

better outcomes.

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