

Access this article online

Quick Response Code:



Website:
www.jehp.net

DOI:
10.4103/jehp.jehp_892_23

Challenges faced by medical faculty in implementation of competency-based medical education and lessons learned

Apurva Agrawal, Ashish Sharma¹, Anita Sharma², Charusmita Agrawal³

Abstract:

BACKGROUND: Regulations on Graduate Medical Education (Amendment), 2019 (GME) introduced competency-based medical education (CBME) for undergraduate medical students and were implemented in the 2019 entrance batch in medical colleges all over India. This study aimed to find out the challenges faced by medical teachers in CBME implementation, lessons learned, and the level of preparedness for upcoming batches.

MATERIAL AND METHODS: A cross-sectional, multi-centric descriptive study was conducted from November 2021 to February 2022 including first-year faculty of medical colleges. A self-administered questionnaire was provided through electronic media, about challenges faced during CBME implementation and suggestions for improvement. Responses were analyzed as descriptive statistics, and content analysis was conducted for open-ended questions.

RESULTS: A total of 50 responses were analyzed. About 46% believed that the foundation course (FC) could satisfy the GME Regulation's goal to only some extent. About 60% believed that integration was not optimum, and 40% had not taken any integrated session. About 36% had not taken any attitude, ethics and communication (AETCOM) session, and 30% considered that they were not sufficiently competent. About 68% believed that early clinical exposure (ECE) given is insufficient. "Skills" (50%) and "attitude-communication" (34%) could not be satisfactorily assessed. About 72% believed that the coronavirus disease 2019 (COVID-19) pandemic significantly affected academics, 20% are still confused about the complexities of CBME, and 58% believed they are better prepared for the future. The COVID-19 pandemic (78%), lack of proper training (70%), and adequate faculty (60%) were common difficulties. Frequent hands-on workshops (68%) and better inter-departmental coordination (68%) were suggested.

CONCLUSION: First professional-year faculties are slowly getting accustomed to the transition from a traditional to a competency-based curriculum. These reforms are complex, and the challenges need to be addressed sincerely and timely.

Keywords:

Competency-based medical education (CBME), medical education, self-directed learning and educational measurement

Introduction

Regulations on Graduate Medical Education were notified way back in 1997. A need was felt for more than 20 years to relook into all aspects of the

existing regulations, and changes were required to make the medical curriculum more learner-centric, patient-centric, and outcome-centric.^[1]

Regulations on Graduate Medical Education (Amendment) 2019 (GME) were notified on May 14, 2019, and were

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow_reprints@wolterskluwer.com

How to cite this article: Agrawal A, Sharma A, Sharma A, Agrawal C. Challenges faced by medical faculty in implementation of competency-based medical education and lessons learned. J Edu Health Promot 2024;13:345.

Department of
Pharmacology, RNT
Medical College,
Rajasthan University
of Health Science,
Udaipur, Rajasthan,
India, ¹Department of
Biochemistry, Geetanjali
Medical College,
Geetanjali University,
Udaipur, Rajasthan,
India, ²Department of
Biochemistry, Himalaya
Institute of Medical
Science, Swami Rama
Himalayan University,
Dehradun, Uttarakhand,
India, ³Department
of Obstetrics and
Gynaecology, SMS
Medical College, Jaipur,
Rajasthan, India

Address for correspondence:

Dr. Ashish Sharma,
Department of
Biochemistry, Geetanjali
Medical College, Udaipur,
Rajasthan, India.
E-mail: ashishapurva@
gmail.com

Received: 24-06-2023
Accepted: 02-01-2024
Published: 28-09-2024

implemented on medical students of the 2019 entrance batch. These regulations introduced competency-based medical education (CBME) for undergraduate medical students. The National Medical Commission (NMC) is the regulatory body in India that has the responsibility of regulating the quality of medical education in the country. It came into force in August 2019 after succeeding the erstwhile Medical Council of India.^[2] The traditional curriculum, which was driven by knowledge and content, and was teacher-centric, is now replaced by a competency-based curriculum, which is student-centric and driven by outcome or knowledge application. Competency is defined as an observable ability of a healthcare professional, and it includes components, such as knowledge, skills, values, and attitudes.^[3]

Transitioning from traditional medical education to CBME requires careful change in the organizational structure of training programs so that new curricula and assessment methods can be delivered. It requires modification in processes of teaching and evaluation, as well as effective communication and strong support among all stakeholders involved in the process.^[4,5]

More than 2 years have passed since the introduction and implementation of CBME in medical colleges all over India. During this time, the world has witnessed tough times with the novel coronavirus disease 2019 (COVID-19) pandemic that has significantly affected the education system throughout the world including medical education.^[6]

Few studies have reported the faculty's perspective on CBME in India. Ramanathan *et al.*^[7] in their study on faculty perception including 91 medical colleges have reported that 80% opined that faculties in departments are inadequate for CBME implementation. Teli *et al.*^[8] have reported that inadequate faculty and lack of coordination among departments can affect CBME implementation. Most of the studies have reported faculty's perceptions but the extent of specific challenges faced have not been focused in these studies.^[7-9] Thus, a need was felt to find out the challenges faced by medical teachers in its implementation, lessons learned, and the level of preparedness of teachers for the upcoming batches.

Materials and Methods

Study design and setting: A cross-sectional, multi-centric descriptive study was conducted including all medical colleges of Udaipur District of Rajasthan State in India. The study was conducted from November 2021 to February 2022. There are one government and four private medical colleges in the Udaipur District.

Study participants and sampling: All teaching faculty members of pre-clinical subjects (anatomy, biochemistry, and physiology) were included in the study as they were the forerunners of the implementation of CBME. A total of 90 first-year faculty from the Department of Anatomy, Biochemistry, and Physiology were contacted.

Data collection tool and technique: A self-administered questionnaire was prepared including both closed-ended and open-ended questions. The questions were related to challenges faced during CBME implementation and covered faculty development, foundation course (FC), integration and alignment, AETCOM modules, early clinical exposure (ECE), self-directed learning (SDL), small group teaching, competency-based assessment, and COVID-19 pandemic's impact on CBME implementation. Every section included open-ended questions for specific problems faced during planning and implementation, as well as suggestions for further improvement. The questionnaire was validated for content validity and face validity with the help of Medical Education Unit (MEU) faculty members and was modified accordingly. The questionnaire was then converted into a Google Form due to the ongoing COVID-19 pandemic and was circulated online.

All first-year faculties from both government and private medical colleges of Udaipur District, whose mobile contact numbers were available on their college website or could be arranged from their college office, were sent the Google Form via electronic platforms. After 1 week, two reminders were sent, 2 days apart, requesting them to fill out the form. Informed consent was taken along with the Google Form. The link was active for 2 months, and after 2 months, the link was deactivated, and no more responses were accepted.

Data analysis: All the responses were analyzed as descriptive statistics, and content analysis was conducted for open-ended questions.

Ethical Consideration: The study plan and the questionnaire were approved by the Institutional Ethical Committee before starting data collection.

Results

A total of 90 first-year faculty from the Department of Anatomy, Biochemistry, and Physiology could be contacted. Fifty-seven responses were received at the end of 2 months; seven responses were grossly incomplete and thus removed from the analysis. Finally, 50 responses were analyzed.

About 42% of respondents were professors, 28% were associate professors, 18% were assistant professors, and

12% were senior residents. About 58% of respondents were members of the MEU in their respective institutes. About 88% of respondents had attended some form of training in medical education [Table 1].

Twenty (40%) respondents believed that the FC conducted was able to satisfy the goal mentioned in GME [Table 2]. Extracurricular activities, sessions on communication, and ECE were the most difficult to implement. The most common suggestion (38% of responses) to improve FC implementation was “to cut short the total hours and spread throughout the year” [Table 3]. About 14% responded that integration in more than 20% of the curriculum was conducted, 60% believed that integration was not optimum, and 40% had not taken any integrated session [Table 2]. Inter-departmental coordination was the most common difficulty (36.5% of responses) faced regarding alignment and integration, and “increase active involvement of clinical faculty,” and “frequent faculty training” were common suggestions for improvement [Table 3].

About 58% of respondents found themselves sufficiently competent in taking AETCOM sessions, while 36% had not taken any AETCOM sessions. Common methods used were group discussions, role-play, and case-based learning [Table 2]. The most common difficulty reported was “lack of motivation in students for AETCOM sessions” (30% of responses) [Table 3].

About 68% of respondents believed that “Not much ECE given or given only to some extent.” About 80% of respondents used the “case-based discussion” method for ECE [Table 2], and the most common difficulty faced was “COVID-19 pandemic and online classes” (29%) [Table 3]. About 48% believed SDL was helpful to some extent in the student’s learning process.

Table 1: General information regarding responders

Components	Options	No. of respondents (%); n=50
Department	Anatomy	15 (30)
	Biochemistry	20 (40)
	Physiology	15 (30)
Designation	Professor	21 (42)
	Associate professor	14 (28)
	Assistant professor	09 (18)
	Demonstrator	06 (12)
	None	9 (18)
FDP attended*	Basic course	23 (46)
	Revised basic course	25 (50)
	CISP workshop	34 (68)
	Advance course in MET	11 (22)
	FAIMER	1 (2)
Member in MEU	Yes	29 (58)
	No	21 (42)

*Respondents could answer more than one option

About 86% answered that they have made specific learning objectives (SLOs) [Table 2]. Respondents mentioned that formulating SLOs is time-consuming and needs more training, and some competencies are very broad and need multiple SLOs [Table 3].

About 54% of respondents reported that blueprinting has been conducted in their department, and 54% considered themselves sufficiently competent in blueprinting. As per respondents, “Skills” (50%) and “attitude and communication” (34%) could not be satisfactorily assessed in formative assessments [Table 4]. About 72% believed that the COVID-19 pandemic significantly affected academics, and practical learning (86%) and ECE (76%) were most affected [Table 2].

In terms of competence in understanding CBME, 20% are still confused about terminologies and complexities, while 58% believed that they are better prepared than last year but still need to learn more. The COVID-19 pandemic (78%), lack of proper training in CBME (70%), and lack of an adequate number of faculty (60%) were the common difficulties stated in the overall implementation of CBME. Better faculty training (78%), frequent hands-on workshops for reinforcement of faculty training (68%), and better inter- and intra-departmental cooperation (68%) were the suggestions given for better implementation of CBME [Table 5].

Discussion

The newly reformed CBME replaced the two-decades-old traditional undergraduate medical education system in 2019. These reforms introduced many new aspects in Indian medical education, such as FC, AETCOM, ECE, small group teaching, SDL, vertical and horizontal integration, and formative assessment methods.^[1] Curriculum implementation support program (CISP) workshops were conducted by the NMC throughout the medical colleges of the country, yet the main burden of implementing these reforms was on the medical faculty. Along with the task of implementing CBME, another important task was to cope with the difficulties of yet another challenge, that is, the COVID-19 pandemic. This study was thus conducted with the vision to find out the extent of implementation, challenges faced by the faculty, and the lessons learned while implementing CBME during the initial 2 years. When this study was planned and conducted, the first batch of CBME was still in the second professional year; thus, faculties of the first professional year who have gone through the year-long process of implementation were included.

The majority of the respondents felt that the FC conducted in their institute could satisfy the GME goal “to only some extent.” As developing soft skills in students is a

Table 2: Responses to questions related to various components of CBME

Questions	Options	No. of respondents (%); n=50
Do you believe that FC conducted is able to satisfy the goal mentioned in GME Regulations, that is, "to prepare a learner to study medicine effectively"?	Definitely yes	20 (40)
	To some extent	23 (46)
	No, not at all	3 (6)
	I am not sure	4 (8)
Last year how much integration was conducted in first-year curriculum?	< 5%	9 (18)
	5-10%	11 (22)
	10-20%	9 (18)
	>20%	7 (14)
	I am not sure	14 (28)
Do you think optimum integration was conducted successfully?	Yes	20 (40%)
	No	30 (60%)
How many sessions were taken by you, which involved more than one department?	1	8 (16)
	2	13 (26)
	3 or >3	9 (18)
	None	20 (40)
How many classes have been taken by you in last year's batch on AETCOM?	None	18 (36)
	1	8 (16)
	2	8 (16)
	3	5 (10)
	4 or >4	11 (22)
Which method was used by you for teaching AETCOM?*	Small group discussion	16 (32)
	Role-play	16 (32)
	Seminar	10 (20)
	Case-based learning/problem-based learning	16 (32)
	Shown AETCOM-based videos	14 (28)
	None	14 (28)
How much competent did you find yourself in taking AETCOM?	Highly competent	3 (6)
	Sufficiently competent	29 (58)
	Not sufficiently competent	15 (30)
	Not competent at all	3 (6)
As last year's academics were affected by the COVID-19 pandemic, how far ECE could be given to students?	Not much ECE given	12 (24)
	To some extent	22 (44)
	Satisfactorily given	14 (28)
	Highly satisfied with ECE	2 (4)
ECE was implemented in which of the following forms?*	Hospital visit	19 (38)
	Clinical laboratory visit	13 (26)
	Shown a clinical case (patient)	8 (16)
	Case-based discussion	40 (80)
	As part of AETCOM module	9 (18)
In your experience, how far SDL was helpful in student's learning process?	Not useful at all	4 (8)
	Useful to some extent	24 (48)
	Moderately useful	14 (28)
	Extremely useful	8 (16)
Did you make SLOs for every competency of your subject/topic taken by you?	Yes	43 (86)
	No	7 (14)
How far the COVID-19 pandemic has affected the academics in CBME?	Significantly affected	36 (72)
	To some extent	14 (28)
	Not affected at all	00 (00)
Which part/parts of CBME were most affected by the COVID-19 pandemic?*	FC	21 (42%)
	ECE	38 (76%)
	Large group teaching	21 (42%)
	Small group teaching	15 (30%)
	Practical learning	43 (86%)
	Integrated learning	33 (66%)

Contd...

Table 2: Contd...

Questions	Options	No. of respondents (%); n=50
	Formative assessment	22 (44%)
	Feedback	13 (26%)
	Reflective writing	17 (34%)
	Logbook	16 (32%)

*Respondents could answer more than one option

Table 3: Responses related to challenges faced and suggestions provided for different components of CBME

Question	Responses	No. of responses (%); n=50
FC		
Which part of FC was most difficult or challenging to implement?	Extracurricular activities	12
	Communication	12
	Integration and alignment	8
	ECE	12
	Skills	6
	Discipline	8
	Assessment	4
Give one suggestion to improve FC and its implementation	Make it optional	2
	Psychiatric counseling to students	2
	More clinical exposure	4
	Include assessment	6
	Cut short the total hours and spread throughout the year	38
	Faculty training and motivation	8
	Improvement of infrastructure	6
	Increase faculty strength	2
	Involvement of senior faculty	2
Alignment and integration		
Mention the most specific difficulty faced during planning and implementation of alignment and integration	Alignment of topics between different departments	14
	Planning of integration	10
	Lack of inter-departmental coordination	30
	Lack of interest shown by clinical faculty	4
	Time management	12
	COVID-19 pandemic	6
	Lack of faculty motivation	2
	Lack of administrative cooperation	2
	Lack of faculty	2
Give one suggestion to improve integration and alignment	Frequent faculty training	10
	Improve active involvement of clinical faculty	14
	Regular academic meetings	6
	Strict implementation of preplanned schedule	10
	Monitoring NMC or institutional head	8
	Uniform schedule to be provided by NMC	6
	Improve intra-departmental coordination	10
	Motivate research in medical education	2
	Motivation of faculty	8
	Increase faculty strength in all departments	4
	More sessions	2
	Flexibility in schedule	4
AETCOM		
Mention one specific difficulty faced while taking AETCOM session	Lack of resource material	10
	Lack of motivation in students for AETCOM sessions	16
	COVID-19 pandemic	6
	Lack of sufficient training	6
	Lack of faculty motivation	6
	Lack of proper assessment in university examinations	2
	Lack of sufficient faculty	4
	Communication problem	4

Contd...

Table 3: Contd...

Question	Responses	No. of responses (%); n=50
Please give one suggestion to improve AETCOM sessions	Student motivation and counseling	10
	Keep interactive sessions	10
	All faculty should be involved	6
	NMC should provide sufficient resource material for AETCOM sessions	10
	Frequent faculty training and motivation	20
	Include AETCOM assessment in university examinations	6
	MEU faculty should take AETCOM sessions	4
ECE		
Difficulties faced while implementing ECE	COVID-19 pandemic and online classes	16
	Real patient availability	12
	Large number of students	10
	Lack of sufficient faculty	10
	Lack of motivation in students	4
	Lack of interest in clinical faculty	4
Suggestions to improve planning or implementation of ECE	Increase number of hospital visits	10
	Faculty training	6
	Include clinical cases in lectures	10
	Improve inter- and intra-departmental coordination	4
	More involvement of clinical faculty	12
	Clear basic concepts first, then implement clinical exposure	4
	Use simulation	6
	Improve faculty strength	6
	Plan small group visits to hospital	4
	Make it simple and relate it to first-year subjects	2

*Questions were open-ended and analyzed by content analysis

Table 4: Responses related to formative assessment

Questions	Options	No. of respondents (%); n=50
Blueprinting has been conducted in your department?	Yes	27 (54%)
	No	17 (34)
	Not sure	6 (12)
How much competent did you find yourself in blueprinting?	Highly competent	2 (4)
	Sufficiently competent	27 (54)
	Not sufficiently competent	14 (28)
	Not competent at all	7 (14)
As last year's academics were affected by the COVID-19 pandemic, how formative assessments were taken last year?*	Online video call-based viva voce	27 (54)
	Online Google Forms	36 (72)
	Other online methods	14 (28)
	Offline	7 (14)
How many times formative assessments were taken from last year's batch?	1-3	22 (44)
	4-6	8 (16)
	>6	20 (40)
Which of the following parts could not be satisfactorily assessed during formative assessment?*	Knowledge	7 (14)
	Skill	25 (50)
	Attitude and communication	17 (34)
	None of them	4 (8)
	All were satisfactorily affected	14 (28)

*Respondents could answer more than one option

new avenue for faculty, extracurricular activities and communication skill sessions were the most difficult to implement. The majority suggested reducing the total hours of FC and spreading them throughout the year, as also suggested by Ramanathan *et al.*^[7] Recently, NMC has reduced FC duration to 1 week, but this applies only to one batch (2021–2022) that was admitted late due to

the COVID-19 pandemic.^[10] It would be much better if 1-month duration of FC is distributed throughout the first year which would give sufficient time to the faculty as well as subject-specific sessions could also be started timely.

Integration of up to 20% of the curriculum in each specialty has been recommended in CBME, and 25%

Table 5: Difficulties faced in overall planning and implementation of CBME, solutions suggested

Questions	Responses	No. of responses (%); n=50
Reasons behind difficulties faced by medical faculty in implementation of CBME in India	Lack of proper training of faculty in CBME	35 (70%)
	Lack of proper guidelines	26 (52%)
	Short transition time provided	19 (38%)
	COVID-19 pandemic	39 (78%)
	Lack of support from administration	12 (24%)
	Lack of proper infrastructure	13 (26%)
	Lack of adequate number of faculty	30 (60%)
What do you believe, could help in better implementation of CBME?	Better infrastructure	22 (44%)
	Better faculty training	39 (78%)
	Frequent hands-on workshops for reinforcement of faculty training	34 (68%)
	Better inter- and intra-departmental cooperation	34 (68%)
Where do you find yourself in terms of competence in understanding CBME?	Still confused about terminologies and complexities	10 (20)
	Better prepared than last year but still needs to learn more	29 (48)
	Satisfactorily competent	9 (18)
	Highly competent	2 (4)

of the allotted time in each professional year shall be utilized for integrated learning.^[1] The majority of respondents believed that optimum integration could not be achieved and 40% of participants had not even taken a single integrated session. Lack of inter-departmental coordination is a major obstacle while implementing alignment and integration in this study, as also reported by others.^[7] Integration and its core approaches, that is, vertical and horizontal, are far from reality and still appear to be on paper.^[11] Haramati A. has stressed that integration in medical education is a sensitive area and needs to be effectively covered in training workshops.^[12]

Though more than half of the respondents consider themselves sufficiently competent in AETCOM, lack of motivation among medical students has been a major problem during these sessions. Another difficulty is the lack of sufficient resource material available for such sessions. Respondents have suggested the need for frequent faculty training in AETCOM as well as the availability of sufficient resource material. Lal *et al.*^[13] have suggested that one-time training is not sufficient and regular sensitization of faculty is important for core competencies of AETCOM.

The ECE given to students was not sufficient. The most common method used was “case-based discussion,” as hospital visits and exposure to the actual clinical patient were not possible due to the COVID-19 pandemic. ECE could make basic science subjects more relevant by increasing interest and motivation in students.^[7,14] Respondents in this study believed that to improve ECE, there is a need to increase the involvement of clinical faculty with more hospital visits.

Specific competencies for each speciality have been provided in the competency-based undergraduate curriculum,^[1] but the SLOs for each competency are to be made by the faculty. The majority answered that

they have made SLOs but found them time-consuming and also felt the need for more training in making SLOs.

As the COVID-19 pandemic had significantly affected the assessment of medical students throughout the world,^[15] respondents in this study also reported that formative assessments were reduced and conducted mainly online, and skills and AETCOM could not be satisfactorily assessed.

Almost half of the respondents accepted that they are better prepared for future batches but still need to learn more about CBME. The most common challenges encountered in overall implementation were the COVID-19 pandemic, lack of proper training in CBME, and lack of adequate faculty. Various faculty development programs (FDPs) were conducted by NMC, and the majority of faculty in this study were trained, yet they felt the need for better and more frequent hands-on workshops for reinforcement of training. New educational roles of faculty in CBME require them to work as a facilitator, planner, manager, and performance assessor, and a mere 3 days of the CISP cannot provide this competency.^[16] There is a requirement for much more elaborative training programs to meet the complexities of CBME and to inculcate confidence in faculty for the same.^[7-9,11]

Limitations and recommendations

This study was restricted to five medical colleges of Udaipur District and first professional-year faculty. Though this study tried to address many aspects of CBME, a few aspects, such as skill laboratory, logbooks, electives, and summative assessments, could not be included.

Conduction of frequent and elaborative FDPs is one of the major recommendations. Reduction in the total duration of FC and spreading it throughout the year,

resource material availability, and taking steps to improve student and faculty motivation are a few other recommendations that can help in boosting CBME.

Conclusion

After more than 2 years of experience in CBME, the first professional-year faculty is slowly getting accustomed to the transition from a traditional to a competency-based curriculum. CBME is envisioned as a necessary linking process to inculcate the qualities of clinical, leadership, communication, professionalism, and lifelong learning in Indian medical graduates. These reforms are complex and challenging, and these challenges need to be addressed sincerely and timely. Lack of inter-departmental coordination, proper training, adequate faculty, student motivation and resource materials for AETCOM, and the COVID-19 pandemic were the major challenges faced. The recommendations can help the policymakers in better implementation of CBME in the country.

Acknowledgment

We extend our sincere thanks to the faculty of the NMC nodal center for FDPs, Smt. NHL Medical College, Ahmedabad, for necessary guidance and encouragement.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- Medical Council of India. Competency based Undergraduate curriculum for the Indian Medical Graduate. 2018. p. 11
- National Medical Commission Act. National Medical Commission. 2019. Available from: <https://www.nmc.org.in/nmc-act/>. [Last accessed on 2022 June 24].
- Shah N, Desai C, Jorwekar G, Badyal D, Singh T. Competency-based medical education: An overview and application in pharmacology. *Indian J Pharmacol* 2016;48(Suppl 1):S5-9.
- Nousiainen MT, Caverzagie KJ, Ferguson PC, Frank JR. Implementing competency-based medical education: What changes in curricular structure and processes are needed? *Med Teach* 2017;39:594-8.
- Caverzagie KJ, Nousiainen MT, Ferguson PC, Ten Cate O, Ross S, Harris KA, *et al.* Overarching challenges to the implementation of competency-based medical education. *Med Teach* 2017;39:588-93.
- Hilburg R, Patel N, Ambruso S, Biewald MA, Farouk SS. Medical education during the coronavirus disease-2019 pandemic: Learning from a distance [published online ahead of print, 2020 Jun 23]. *Adv Chronic Kidney Dis* 2020. doi: 10.1053/j.ackd.2020.05.017.
- Ramanathan R, Shanmugam J, Sridhar MG, Palanisamy K, Narayanan S. Exploring faculty perspectives on competency-based medical education: A report from India. *J Educ Health Promot* 2021;10:402.
- Teli A, Harakuni S, Kamat C. Quantitative and qualitative evaluation of perception of medical faculty toward competency-based medical education for undergraduate curriculum. *BLDE Univ J Health Sci* 2021;6:143-9.
- Rustagi SM, Mohan C, Verma N, Nair BT. Competency-based medical education: Perceptions of faculty. *J Med Acad* 2019;2:1-5.
- Guidelines for implementation of new CBME course curriculum for MBBS batch 2021-22 admitted in Feb-March 2022. Available from: <https://www.nmc.org.in/information-desk/all-news/>. [Last accessed on 2022 Jun 24].
- Rajashree R, Chandrashekar DM. Competency-based medical education in India: A work in progress. *Indian J Physiol Pharmacol* 2020;64(Suppl 1):S7-9.
- Haramati A. Educating the educators: A key to curricular integration. *Acad Med* 2015;90:133-5.
- Lal S, Sehgal P. Integration of attitude, ethics, and communication competencies into competency-based UG curriculum. *Indian J Community Med* 2022;47:4-7.
- Kar M, Kar C, Roy H, Goyal P. Early clinical exposure as a learning tool to teach neuroanatomy for first year MBBS students. *Int J Appl Basic Med Res* 2017;7(Suppl 1):S38-41.
- Ryan MS, Holmboe ES, Chandra S. Competency-based medical education: Considering its past, present, and a post-COVID-19 era. *Acad Med* 2022;97:S90-7.
- Sharma R, Bakshi H, Kumar P. Competency-based undergraduate curriculum: A critical view. *Indian J Community Med* 2019;44:77-80.