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Evaluation of newly introduced structured foundation course in MBBS curriculum at entry level in India: Students' perspective

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ABSTRACT

Background: One-month structured foundation course is an integral component of the newly designed CBME curriculum as proposed in "Graduate Medical Education Regulations-2019" by Medical Council of India. Purpose of this program is to assist fresh MBBS students in acclimatising to the new challenging environment of medical profession and in acquiring basic skills and professional attributes. **Aims and Objective:** Study was aimed to evaluate the students' perception regarding the knowledge and importance of different modules of the foundation course and to assess the effectiveness and quality of the program. **Materials and Methods:** A cross-sectional study was carried out among 120 first year MBBS students using pre-validated questionnaires. Pre questionnaire having three sections and post questionnaire having four sections were distributed at the start of course and towards the end of first year respectively using Google forms. Data was analyzed using SPSS version 22.0 and tests were done at a significance level of 5%. **Results:** Mean scores of perceptions of knowledge and importance for all the modules increased after the course except for importance of Enhancement of language and computer skills module and the difference was statistically significant. Professionalism and ethics module was the most practically implemented module throughout the first year. Over-all rating of this one- month course was 3.31 ± 0.78. **Conclusion:** Feedback responses from students were indicative of the effectiveness of this program. This study sheds light on the significance of the foundation course in making the medical graduate an effective health care provider and physician of first contact of the community.

Key words: Program evaluation; Medical students; Feedback; Perception; India

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INTRODUCTION

Medical profession not only requires competency in clinical skills and profound knowledge, but also demands excellence in behavioural and professional attributes. In India, medical education requires intense training in an extensive spectrum of domains that involves exposure to social interactions and interpersonal conjunction. Students entering in this profession at the age of 17-18 years may find it difficult to cope up with the academically challenging environment in medical college due to language barriers or diverse cultural and socioeconomic backgrounds. Moreover, admission of candidates in the medical profession merely depends on their ranks in competitive entrance exams.[1] Non-scholastic abilities which include personal characteristics, interpersonal activities and communication skill domains, are not taken into account. As these non-scholastic abilities play a crucial role in physician's excellence and professionalism, it was much required to include adaptation in the medical

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curriculum to support these qualities of those entering into this profession. [2-4]

Keeping in view the need of the time, the Medical council of India (MCI) proposed a foundation course in its "Regulations of graduate medical education 2012" [5] and document "VISION-2015" [6] which emphasized on behavioural competency, familiarization with institutional environment, stress-coping strategies, and modern teaching-learning techniques to improve the standards of medical education. After a gap of nearly two decades, MCI revised the curriculum of medical undergraduates, making it learner centric and competency based medical education (CBME).[7] One month foundation course is a fundamental component of newly designed CBME curriculum as proposed in "Graduate Medical Education Regulations-2019" (GMER-2019).[8] The purpose of the foundation Course include: 1) to create a responsible breed of Indian Medical Graduates (IMG) who can become physician of first contact of the community by possessing the required knowledge, skills, attitudes, and values 2) enabling them to acquire certain basic skills, important for good patient care 3) providing a platform to interact with peers and faculty 4) furnishing their language and communication skills and sensitizing them to the use of computer-aided learning in medical care. One-month structured foundation course at the entry level of fresh MBBS students, has been implemented across the country to acquaint them to all the aspects of medical college environment and to make students more competent and skilled medical personnel to match the qualities of IMG.

This study highlights the relevance of such a foundation course implemented in our institute and the feedback from students was taken to evaluate their perceptions regarding the knowledge and importance of different modules of foundation course. This study will facilitate revisions to make this course more effective and relevant.

MATERIAL AND METHODS

Study population and design

This prospective and cross-sectional study was conducted at Shaheed Hasan Khan Mewati Government Medical College, Haryana. Preclinical departments after having discussion with Medical Education Unit designed one-month schedule of foundation course as per the guidelines given in GMER-2019 and conducted it from August1st to August 31st, 2019 for first professional year MBBS students of 2019 batch. Faculties from pre-clinical, para-clinical and clinical departments, expertise in respective fields, delivered the topics related to various modules of this course. Modules were delivered using different teaching-learning methods like overview lectures, small group discussions, interactive sessions, panel discussion, role play, demonstration with hands on training, etc.

Study tool

Structured pre and post foundation course questionnaires with close ended questions were developed which included five modules of the course. Pre questionnaire comprising three sections was given after the welcome address by the Director and an ice-breaking session. Post questionnaire comprising four sections was given purposefully at the end of first year to assess whether this course actually provided a strong foundation for learning and to know about its practical implementation during the first professional year. Section one of both questionnaires was similar and explored about age, gender and medium of higher secondary education. Section two and three of both the questionnaires were regarding students' perception of knowledge and importance respectively about various modules of foundation course. The students' rating of the perception of knowledge was done on a five-point Likert scale as follows: 1= No knowledge, 2= Poor knowledge, 3= Sufficient knowledge, 4= Good knowledge and 5= Excellent knowledge. The students' rating of the perception of importance was also done on a 5-point Likert scale as follows: 1= Not at all important, 2= Slightly important, 3= Moderately Important, 4= Very important, and 5= Extremely important. Section four of the post questionnaire meant to know about the extent to which knowledge gained from different modules was practically implemented throughout the first professional year. Students' rating of practical implementation of knowledge was done on a 3-point Likert scale as follows: 1= Not at all, 2= To some extent, and 3= To great extent. Section four of the post questionnaire also comprised five close-ended questions to be answered as Yes or No, to evaluate the effectiveness of foundation program. Students' rating of the overall quality of this program was done on a 5-point Likert scale as: 1= Poor, 2= Fair, 3= Good, 4= Very good and 5= Excellent. Likert scale is employed in research, based on questionnaires, to measure attitudes and opinions at the end of training or educational program.[9]

Questionnaires were refined to enhance comprehension by summing up the opinions of ten randomly selected faculty members. Reliability of the questionnaire was determined by doing a pilot study with 30 participants who matched the sample but were out of the sample. Both pre and post questionnaires were found reliable as Cronbach's alpha coefficient values were 0.957 and 0.980 respectively. The questionnaires were delivered to all the students online using Google forms.

Data collection and analysis

Participation was voluntary and informed consent was taken prior to filling the questionnaire. The purpose of this study was explained in an introductory paragraph posted along with the survey. Appropriate instructions about filling the questionnaire were briefed but it was not mandatory to respond to every question. Sufficient time was given to the students to read, comprehend and respond. The confidentiality and anonymity of participants were maintained. Data collected were tabulated and analysed using SPSS version 22.0 (IBM Corp. Armonk, NY, USA). KMO (Kaiser-Meyer-Olkin) test and Bartlett's test of sphericity to determine sample adequacy and appropriateness of data for factor analysis were done. Descriptive statistics, Skewness and Kurtosis method to test the normality of data, and after considering its results; Wilcoxon signed-rank Test and paired *t*-test were applied to analyse the data. Significance level was considered less than .05 ($P < .05$).

Ethical issue

Present study was carried out after getting approval from the Institutional Ethics Committee (EC/OA-33/2020).

RESULTS

Out of 120 students, 118 completed the pre questionnaire before the course, out of which 96 (81.4%) were males and 22 (18.6%) were females. Total 111 students completed the post questionnaire, out of which 88 (80%) were males and 23(20. %) were females. Majority (96%) belonged to 17-22 years of age group (19.84 ± 1.41). Majority (94%) completed their senior secondary education in English medium.

Tables 1-5 summarize the mean scores of students' perception of knowledge and importance of orientation, skill, community, professional development and ethics, and enhancement of computer and language skills modules before and after the foundation course. It was observed that mean scores of perceptions of knowledge and importance of all the modules increased after the course (Figure 1 and 2).

Differences in pre and post perception mean scores of knowledge of orientation, skill, community, professional development and ethics, and enhancement of computer and language skill modules were found to be extremely statistically significant ($P<.0001$). Differences in pre and post perception mean scores of importance of orientation, skill, community, and professional and ethics modules were found statistically significant ($P<.05$). No statistically significant difference was observed in pre and post perception means scores of importance of enhancement of computer and language skills module (Table 6 and 7).

It was observed that knowledge gained from professional and ethics module was practically implemented to a

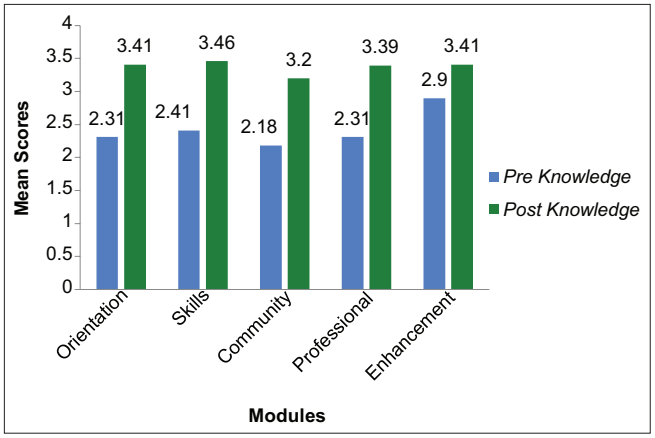

Figure 1: Bar diagram showing perception of knowledge levels of various modules before and after the foundation course

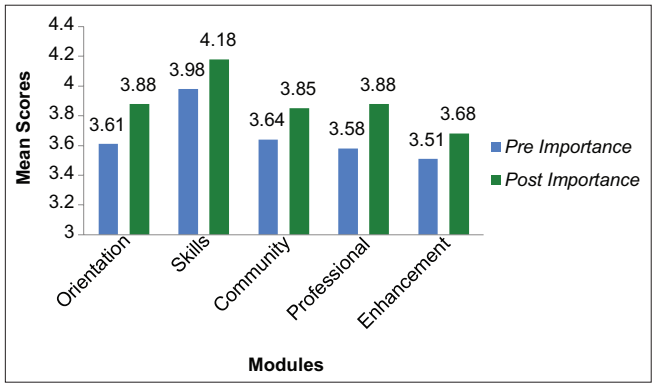

Figure 2: Bar diagram showing perception of importance levels of various modules before and after the foundation course

Table 1: Responses to the Orientation module before and after the foundation course

SN	Topics	Knowledge		Importance	
		Before	After	Before	After
1	Introduction to institution / campus / facilities	2.20±0.97	3.59±1.12	3.51±1.22	3.99±1.06
2	Role of doctors in the society	2.96±0.89	3.80±1.06	4.16±1.01	4.20±1.14
3	History of Medicine and alternate systems	2.05±0.95	3.06±1.04	3.26±1.21	3.56±1.17
4	IMG roles / overview MBBS curriculum/ various career pathways	2.17±1.06	3.41±1.08	3.69±1.20	3.87±1.04
5	Principles of family practice	2.16±1.05	3.19±1.06	3.40±1.18	3.76±1.08

All values are Mean ± SD on a Likert scale of 1 to 5

Table 2: Responses to the skill module before and after the foundation course

SN	Topics	Knowledge		Importance	
		Before	After	Before	After
1	First Aid	2.52±0.87	3.38±1.09	4.06±1.09	4.25±1.10
2	BLS (Basic Life Support)	2.21±0.93	3.31±1.11	4.05±1.03	4.18±1.04
3	Universal precautions	2.22±0.88	3.46±1.02	3.92±1.14	4.18±1.07
4	Waste management	2.57±0.99	3.73±1.18	3.98±1.17	4.27±1.08
5	Immunization	2.64±0.81	3.55±1.11	4.24±0.98	4.28±1.08
6	Documentation	2.26±0.97	3.33±1.12	3.56±1.22	3.93±1.15

All values are Mean ± SD on a Likert scale of 1 to 5

Table 3: Responses to the community orientation module before and after the foundation course

SN	Topics	Knowledge		Importance	
		Before	After	Before	After
1	National Health goals and policies/ health care systems/ community health	2.15±1.02	3.10±1.04	3.48±1.17	3.75±1.05
2	Interactions with patients and families, Communities	2.21±1.06	3.33±1.11	3.79±1.17	3.96±1.18

All values are Mean ± SD on a Likert scale of 1 to 5

Table 4: Responses to the professional development and ethics module (P&E) before and after the foundation course

SN	Topics	Knowledge		Importance	
		Before	After	Before	After
1	Concept of Professionalism and Ethics	2.26±1.04	3.61±1.22	3.44±1.29	3.91±1.09
2	White coat Ceremony	1.64±0.95	2.91±1.34	3.25±1.35	3.43±1.33
3	Professional behavior and altruistic behavior	2.22±1.05	3.49±1.10	3.58±1.20	3.94±1.14
4	Working in a healthcare team	1.87±1.01	3.25±1.17	3.63±1.17	3.89±1.09
5	Disability competencies	1.89±0.99	3.09±1.21	3.27±1.16	3.61±1.09
6	Cultural competence	2.38±0.99	3.32±1.24	3.25±1.17	3.63±1.16
7	Stress management	2.71±0.98	3.65±1.19	3.82±1.15	4.16±1.11
8	Time management	2.86±0.90	3.72±1.24	4.07±1.07	4.13±1.15
9	Interpersonal relationship	2.42±0.98	3.37±1.13	3.60±1.18	3.82±1.05
10	Learning	3.00±0.90	3.61±1.09	3.97±1.07	4.12±1.11

All values are Mean ± SD on a Likert scale of 1 to 5

Table 5: Responses to the enhancement of language and computer skills module before and after the foundation course

SN	Topics	Knowledge		Importance	
		Before	After	Before	After
1	Communication	2.86±1.02	3.41±1.10	3.76±1.15	3.91±1.16
2	Local language training	2.76±1.02	3.31±1.22	3.53±1.17	3.76±1.19
3	English Language training	3.06±0.96	3.49±1.05	3.56±1.18	3.58±1.17
4	Computer Skills training	2.90±1.12	3.34±1.11	3.16±1.14	3.38±1.19

All values are Mean ± SD on a Likert scale of 1 to 5

great extent by 53%, whereas knowledge gained from enhancement of computer and language skills module was practically implemented to a great extent by only 27% of students throughout the first professional year (Table 8).

Positive feedback from students in regards to parameters used to evaluate the effectiveness of this foundation course were between 80-85%. Astonishingly, out of 111 students, 28 (25%) didn't feel excited about their choice of selecting an MBBS course after this foundation program (Table 9).

All-inclusive rating of this one- month course was 3.31±0.78 (Figure 3). The data was found suitable for factor analysis as KMO sample adequacy value for both questionnaires was >0.8 and *P*-values were < .0001 (Table 10).

DISCUSSION

As per GMER-2019, the goal of this dedicated one-month foundation course at the beginning of MBBS is

Table 6: Nonparametric (Wilcoxon Sign Rank Test)

Ranks					Z	*P*–Value
Modules		**N**	**Mean Rank**	**Sum of Ranks**		
Pair 1: Post Orientation module Knowledge–Pre Orientation module Knowledge	Negative ranks	17	31.74	539.50	-7.242	.0001***
	Positive ranks	89	57.66	5131.50		
	Ties	5				
	Total	111				
Pair 2: Post Orientation module Importance–Pre Orientation module Importance	Negative ranks	38	45.12	1714.50	-2.245	.025*
	Positive ranks	58	50.72	2941.50		
	Ties	9				
	Total	105				
Pair 3: Post Skill module Importance–Pre Skill module Importance	Negative ranks	32	41.13	1316.00	-2.390	.017*
	Positive ranks	54	44.91	2425.00		
	Ties	14				
	Total	100				
Pair 4: Post Community module Importance–Pre Community module importance	Negative ranks	34	40.50	1377.00	-1.994	.046*
	Positive ranks	51	44.67	2278.00		
	Ties	21				
	Total	106				
Pair 5: Post Professional development module Importance–Pre Professional development module importance	Negative ranks	35	44.07	1542.50	-2.324	.020*
	Positive ranks	57	47.99	2735.50		
	Ties	2				
	Total	94				

Negative ranks: Pre > Post; Positive Ranks: Post>Pre ;Ties= Pre=Positive

**P* ≤.05 is statistically significant, ****P* ≤ .0001 is extremely statistically significant

Table 7: Parametric test (Paired t-Test)

Modules		Mean	Mean Difference	t	P–value
Pair 1	Pre Skill module Knowledge	2.37±0.66	-1.06±1.07	-10.103	.0001***
	Post Skill module Knowledge	3.44±0.97			
Pair 2	Pre Community module Knowledge	2.13±0.91	-1.08±1.34	-8.470	.0001***
	Post Community module Knowledge	3.22±0.97			
Pair 3	Pre Professional module Knowledge	2.28±0.64	-1.13±1.07	-10.379	.0001***
	Post Professional module Knowledge	3.41±0.98			
Pair 4	Pre Enhancement module Knowledge	2.90±0.81	-0.49±1.17	-4.404	.0001***
	Post Enhancement module Knowledge	3.40±0.93			
Pair 5	Pre Enhancement module Importance	3.47±0.97	-0.24±1.34	-1.820	.072
	Post Enhancement module Importance	3.71±0.98			

***P ≤ .0001 is extremely statistically significant

Table 8: Extent of practical implementation of knowledge gained from various modules of foundation course

Modules	Not at All (%)	To some Extent (%)	To Great Extent (%)
1.Orientation Module	08 (7.2)	68 (61.3)	35 (31.5)
2.Skill Module	16 (14.4)	56 (53.2)	36 (32.4)
3.Community Module	17 (15.3)	62 (55.9)	31 (27.9)
4.Professional Development Module	10 (9.0)	48 (43.2)	53 (47.7)
5.Enhancement Module	27 (24.3)	56 (50.5)	27 (24.3)

Table 9: Questions / parameters to assess the effectiveness of foundation course (n=111)

Questions / parameters	No (%)	Yes (%)
1. Whether this course assisted you in acclimatizing to a new professional environment?	21 (18.9)	90 (81.1)
2. Whether the content of foundation course was useful and relevant?	16 (14.4)	95 (85.6)
3. Whether the sessions were interactive?	20 (18.0)	91 (82.0)
4. Whether the presentations were clear and informative?	21 (18.9)	90 (81.1)
5. Whether this foundation course made you feel excited about your choice in selecting the MBBS course?	28 (25.2)	83 (74.8)

to acquaint the fresh medical students with the required in-depth knowledge and sound skills that will help him/her in acclimatising to the new professional environment.[8] This study was done to evaluate students' perceptions about

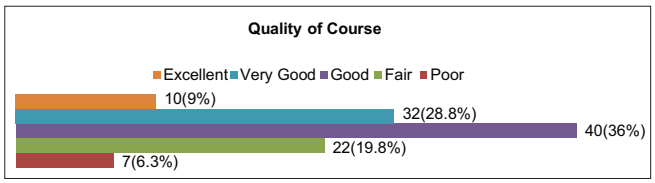

Figure 3: Diagram showing overall grading of foundation course (n=111)

Table 10: Factor analysis

KMO and Bartlett's Test		Pre	Post
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.804	0.878
Bartlett's Test of Sphericity	Approx. Chi-Square	4412.33	5662.41
	df	1431	1431
	P-value	<0.0001	<0.0001

df=degree of freedom

various modules of this course and to assess whether the objectives of this course were met or not. Out of 111, 90 (81%) students responded that this course assisted them in acclimatizing to a new professional environment and 95% students found the content relevant and useful. A statistically significant difference ($p<0.05$) between pre and post mean scores of perceptions of knowledge and importance about all modules was observed except the perception of importance of Enhancement of computer and language skills module.

Medical education task group of the National Rural Health Mission of Ministry of Health and Family Welfare suggested inclusion of a foundation course from the beginning of MBBS with an objective of sensitizing the students with essential skills and sound knowledge.[10] MCI document "Vision 2015" emphasized on the need for a foundation course of two months duration to make medical graduates more competent and skilled personnel.[6] After that, many colleges across India conducted short duration foundation courses or orientation programs to meet these objectives. In the recent past, few studies were done to assess the usefulness and relevance of these short duration foundation course or orientation programs which included some similar topics like ethics, communication, language, stress management, basic skills, etc. After thorough literature search, we found only one such study on newly introduced structured one-month foundation course as per "GMER-2019" conducted by Dixit et al., which also revealed statistically significant difference in pre and post mean scores of knowledge and perception of various modules.[11]

This course was found very useful in orienting the learners to the institution and available facilities and to their role as a doctor and team leader in the society. They were also updated on the history of medicine and also about alternative health systems and schemes including Ayushman Bharat. Difference in pre and post knowledge mean scores about orientation module (allotted 30 hrs) was found statistically significant. Dixit et al. also observed significant difference in pre (1.198) and post mean scores (3.314) of this module.[11]

A great need was perceived in the recent past that students should be trained about basic skills prior to entering the patient care areas. This course helped the students not only in learning skills like first-aid and basic life support (BLS), but also created awareness about immunization and universal precautions including patient and biohazard safety. Significant difference in pre (2.41) and post (3.46) mean scores of knowledge about skill modules (35 hrs) was observed and results concurred with study conducted by Dixit et al.[11] Francis et al. reported that understanding of BLS and first aid improved to great extent in 36% and to some extent in 63% students after a three-day orientation program.[12]

This course apprised the students about the health care system, principles of community health and national health policies. This course provided them an opportunity to learn the skills required to interact with patients. Statistically significant difference in pre (2.18) and post (3.20) mean scores of knowledge about community orientation module (8 hrs) was observed and results were in conformity with study done by Dixit et al.[11] Mittal et al. reported that knowledge gained to great extent in 61% and to some extent in 33% about community health care after a two-days orientation program for 2nd professional year MBBS students.[13]

It has been very challenging for medical teachers to inculcate basic principles of ethics and professionalism in these fresh medical learners. "Clinically essential skills and vast knowledge, sound communication skills, and fundamental understanding of ethics constitute the foundation of professionalism. Altruism, accountability, humanism and excellence are attributes of professionalism.[14] This study revealed that students had less prior knowledge about professionalism and ethics (P&E) module. Significant difference in pre and post mean scores of knowledge for this module (40 hrs) was observed. Results concurred with the study carried out by Dixit et al. in which these scores were 1.0 and 3.30 respectively. [11] In this regard, Suman et al. observed that out of 97, only 24 students had prior knowledge about ethics and professionalism, but 43 students gained the knowledge to great extent after a seven-day foundation course. [10] Jagathi et al. reported that 74.2% students understood the concept of ethics well and found it easily implementable after a one-week orientation

program.[15] In a study conducted by Mahajan and Gupta, which took faculty's perspective also into consideration, 112 students out of 213 responded that understanding of ethical issues in the medical profession improved to great extent after attending orientation program. [16] Srimathi reported that almost 97% students gave positive feedback about medical ethics after an eight-day foundation course. [17]

India's health system is facing crisis as violence against doctors is increasing day by day which indicates that improvement in communication between doctor and patient by imparting training to the current generation of doctors is critically required.[18-20] The course sensitized the students to legal issues like medical negligence, consumer protection act, gender sensitisation and documentation. This course emphasizes on the significance of meaningful doctor-patient relationship which can reduce the immensity of the problem to some extent.

Before the foundation course, students were quite aware about the importance of enhancement of computer and language skill module (40 hrs). Pre knowledge and importance scores for computer skills were 2.90±1.12 and 3.16±1.14 respectively and for English language, scores were 3.06±0.96 and 3.56±1.18. Dixit et al. observed similar results with regard to computer skills, where pre knowledge and importance scores were 2.00±0.36 and 3.00± 0.39 respectively.[11] Suman et al. also noticed that more 50% of students were having prior knowledge about use of the internet and library, and English competence.[10] This may be attributed to the fact that teaching computer skills is an integral part of schooling nowadays. However, a significant difference in knowledge gained about the importance of information technology and data searching in health, communication skills and local language was noticed in this study.

Sports and extracurricular activities have also been encompassed in this course to demonstrate the importance of work life balance in this demanding profession,[21] but feedback was not taken about this module in our study. This study revealed that after this course, 25% students were not excited about their choice of selecting the medical profession as their career but as this parameter was not considered in pre questionnaire, nothing concrete could be concluded. It can be attributed to the fact that parental influence still plays a significant role in making career choices in India.[22]

Previous studies recommended a structured foundation course of longer duration and at all the possible levels.[10,13,15,17] Some authors even suggested structured internship training programmes for smooth progression to clinical work.[23,24] The institute of international medical education (IIME), New York, defined global minimum essential requirements (GMER), which are grouped into seven wide academic domains.[25] This newly implemented structured one-month foundation course accommodates all recommendations and introduces the students to almost all these domains. The components of this foundation course are multifarious and some identified domains need subsequent outcome-based sessions by activities spirally amalgamated throughout the course of MBBS.[8]

Feedbacks about this course were very encouraging and satisfactory. We are planning to evaluate this course again by doing longitudinal studies and taking both students' and faculties' perceptions into account.

Limitations of the study

Subjective and recall bias were significant limitations of the study. This study evaluated only students' perception of knowledge about various modules of the foundation course but not assessed the actual knowledge or skills practically. Furthermore, the validity of the questionnaire requires it to be assessed.

CONCLUSION

This study showcased the effectiveness of the foundation course and the findings were clearly indicative of its key importance in regard to the new CBME. So, authors conclude that this course would give an invaluable insight into multiple facets of the medical profession and assist students to acquire skills essential to become an effective health care provider. This course would help in priming students to cope up with the myriad of challenges faced in this profession and facilitate their transition from spoon-fed learners to self-directed learners. On the basis of observations of this study, authors suggest that teaching about scientific research methodology would be more beneficial than teaching basic computer skills during this course.

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