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Integrating Ethics into the Physiology curriculum: a scale-up study in three medical colleges in Karnataka, South India

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Abstract

A published pilot study showed the feasibility of integrating ethics into physiology in a single medical college. However, questions were raised about feasibility of scale-up and acceptance across different colleges. To assess feasibility of integrating ethics into Physiology, first year MBBS students of three medical colleges (n=449, College A=149; 59M, 90F; College B=150; 78M, 72F; College C=150; 48M, 102F) were exposed to the integrated ethics programme. Triggers related to theory or practicals were included. Faculty volunteers conducted the sessions with feedback from observers and students. Students across three colleges felt that the programme was relevant (92%–98%), effectively integrated (86%–98%) [significantly greater number of College A students: (p=0.003)], seldom interfered with physiology teaching (59%–66%). Greater number of students from College C followed by College B and A opined to continue the integrated programme for future years (p=0.004). A scale-up study of integration of ethics programme across different colleges was perceived to be feasible by students and observers.

Introduction

Ethics is a part of the medical curriculum in many countries (1–4). Separate classes on ethics during the medical course help develop thought processes on ethical dimensions of the medical profession. Integration of ethics into the curriculum is one step ahead (1,5) that makes ethics an indispensable part of the course and provides a continuous exposure and "lived-in experience" (6,7). According to an online survey (8), medical colleges in a very few countries have introduced integrated classroom teaching of ethics in the preclinical year (physiology) , and at bed-side clinics (4,9). In India, the Medical Council of India (MCI) has placed emphasis on training in ethics, attitude and communication through the "Attitude and Communication Skills" (ATCOM) module (10,11), which is yet to be operationalised and faces challenges in practical application Not many medical faculty are formally trained in ethics and few centres in the country provide such training (12–15). However, some believe that any experienced faculty member can stimulate the young minds of medical students to think about ethical issues in medical practice (7).

Further, during the preclinical year, the students are exposed to classroom teaching, practical classes and cadaveric dissection with hardly any interaction with patients. There have been some concerns that the preclinical year provides a dehumanising experience (16,17). Physiologists, who deal with the understanding of life processes and thereby experiment on animals and humans, are constantly confronted with ethical dilemmas (8,18,19).

One medical college involved in this study (coded in this paper as College A) has conducted for several decades formal, separate classes on ethics as a part of the medical course (20,21). Recently, a pilot study for an integrated ethics programme in the physiology course work was introduced at College A, which was well received by the students (7). They recognised the need to take ethical issues into consideration from the beginning of medical training and through future years. A state-level workshop was organised for physiologists with the aim of disseminating the idea of the pilot programme and identifying the challenges faced across various medical college settings (22). As an outcome of the workshop, two other medical colleges from the state (coded as College B, College C) collaborated with College A to introduce the programme at their institutions. Thus, a scale-up study of the integrated ethics programme into the physiology curriculum was conducted simultaneously at three medical institutions. The objectives were to assess the feasibility, relevance, benefits, merits and demerits of continuing the programme in future

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To cite: Savitha D, Geetha S, Bhaskar S, Anto T, Sejil TV, Vittal V, Ghosh S, Kumar P. Integrating Ethics into the Physiology curriculum: a scale-up study in three medical colleges in Karnataka, South India. *Indian J Med Ethics*. Published online on July 5, 2018. DOI:10.20529/ IJME.2018.053.

Manuscript Editor: Mala Ramanathan

Peer Reviewers: Satendra Singh, Sudarshini Subramaniam

and collect suggestions for improvement of incorporating ethics into the physiology curriculum as perceived by the students across the three colleges and to compare their responses.

Methodology

Following the pilot study conducted by College A (7), an invitation to participate in a scale-up study was extended to various colleges from all over the state in the workshop that followed (22). The scale-up study was conducted with the two colleges that responded favourably. The three medical colleges were coded as College A, B, and C to maintain anonymity. This was done in consensus with all the investigators across the three institutions. First year MBBS students (n=449) from the 2016–17 batch of College A: n=149; 59M, 90F; College B: n=150; 78M, 72F; College C: n=150; 48M, 102F were enrolled in the programme. The three colleges were from two different universities. One college was a private Catholic-minority institution under the State Medical University with formal separate classes on ethics for undergraduate students conducted by the Medical Ethics department functional for several years, the second college was a private institution from the same State Medical University the students had no exposure to sessions on Ethics and the third was a private medical college under a different deemed university not conducting any course in Ethics. The methodological limitation of non-inclusion of a government medical college, despite the investigators' efforts due to constraints and challenges of implementation needs to be mentioned (22). The admission process for the academic year 2016–17 was similar across the three colleges through the National Eligibility Entrance Test (NEET), which is the common medical entrance test throughout the state. Thus, the students enrolled for this study fairly represent medical students across the state. Ethical clearance was obtained from the institutional ethics committees of all three medical colleges. Informed consent was obtained from the students. The students being a "vulnerable group", the investigators tried to minimise the bias by ensuring that the consenting process for the students was carried out by co-investigators who were not directly involved with the evaluation of the students. The students were assured that they would not be assessed on the basis of their participation in the programme or on the basis of the feedback that they provided for the programme. The feedback obtained at the end of the programme was completely anonymous so that they were free to express their opinions. The faculty conducting the session took care to be mere facilitators and not teachers, which minimised the students' inhibitions about sharing their sincere opinions.

The students across the three colleges were exposed to eight sessions of integrated ethics programme spread throughout the year during the routine Physiology course with each session lasting for 15–20 min (7). The principal investigator and the co-investigators from the participating institutes conducted the sessions at their respective colleges. Each session was held either at the end of a theory class, where the faculty who took the class had a relatively small topic to cover, or in a practical class where the experiments were relatively simpler and could be completed soon. Care was taken to see that these sessions did not interfere with the regular teaching schedule. The topics, contents and methods of each session conducted in this study were derived from the pilot study conducted at College A (7). They were predefined and circulated among the investigators of the three colleges to maintain uniformity. Triggers included were in the form of a story or reference related to the day's theory or practical class such as confidentiality, informed consent, ethics related to animal research, ethical issues around clinical examination, stigma, the issue of labelling and end-of-life care (Table 1). The sessions were open-ended and student-centred, aimed to stimulate critical thinking as in the pilot study (7). The faculty who conducted the sessions took special care not to teach but facilitate thinking and discussions. The sessions were audio-recorded and circulated among the investigators of the three colleges and mutual feedbacks were shared after each session. A faculty from another department of the same institution, invited as an observer, provided qualitative feedback on the content, methods and students' involvement in each of the sessions. At the end of the academic year, students' feedback was obtained across the three colleges through a semi-structured questionnaire. The semi-structured feedback questionnaire used in the scale-up study was developed by the authors of the pilot study, one of whom was a medical teacher (Physiology), the second was a person with experience in qualitative research, social sciences and ethics; the third who was the head of division of Health and Humanities and professor of Physiology. The questionnaire was pretested and applied in the pilot study (7). The questionnaire was developed with the intention of capturing the perceptions of students in terms of relevance, feasibility benefits, merits and demerits of continuing the programme in future, and suggestions for improvement in the integration of the Ethics course in Physiology by means of both open-ended and close-ended questions (Likert-scale responses, yes/no responses).

Data entry and analysis

Data entry was done by the investigators from each institution for their respective students and sent to the principal investigator at College A for further analysis. The investigators and a statistician at College A conducted the data analysis. T-test and chi-square tests were applied to analyse and compare the data across colleges and across gender. The open-ended questions were segregated and analysed by inductive thematic analysis by the principal investigators of the three colleges and the statistician to minimise subjective variation.

Results

The feedback forms were filled by 407 out of 449 students who were exposed to the programme across the three colleges. The demographics (Table 2) showed a heterogeneous group of students from different states across the country and belonging to both sexes. The quantitative data presented

Table 1:

Workplan of the integrated ethics programme (7)

Sl No	Topic	Trigger (issues linked to)	Class during which it was conducted	Methods (using powerpoint presentation)
1	Ethical issues related to the use of residual samples	Practicals on haemoglobin estimation of a blood sample from blood bank	Practicals	Narration of story of Henrietta Lacks and the HeLa cell line
2	Anonymity and confidentiality of datasets	Practicals with student data of haemoglobin values on the blackboard with identifier links to roll numbers	Practicals	Discussion on the issue of maintaining confidentiality and anonymity using documentation of haemoglobin and red blood cells on the blackboard
3	Issue of "labelling"	Practical class on blood pressure recording	Practicals	Case history of a patient diagnosed with hypertension but no proper counselling
4	Ethical issues related to animal experiments	Discussion of amphibian muscle and nerve and cardiovascular experiments through recordings in graphs and charts	Theory	Discussion on the use/ abuse of animals in research
5	End-of-life care – ethical challenges	Theory class: applied physiology of gastrointestinal tract	Theory	Case history of a patient who is terminally ill leading to issues related to withdrawal of treatment and debate around a "good" death
6	Clinical examination –ethical issues	Clinical physiology practical where students volunteer to be examined by their peers	Practicals	Interactive session on issues of "greater good" and "putting yourself into the shoes of the other"
7	Dealing with stigma	Theory class on endocrine disorders, namely gigantism, dwarfism, cretinism	Practicals	Discussion on the impact of stigma related to physical disability on health issues
8	Summarising session	Toward the end of the preclinical year	Theory	Recap of all the above sessions, followed by interactive session on the transition from preclinical to clinical training

Table 2:

Demographics of students who filled in the feedback questionnaire

	College A	College B	College C
Total (n)	n=147 (M=57, F=90)	120 (M=58, F=62)	140 (M=45, F=95)
Age groups	17–20 years (n=120) 21–34 years (n=27)	17–20 years (n=106) 21–25 years (n=14)	17–20 years (n=140)
Mother tongue Total types of languages Top 2 of the majority	15 Malayalam=66 Hindi=25	09 Telugu=35 Hindi=34	16 Kannada=57 Hindi=22
Nationality	Indian=147	Indian=119 US=1	Indian=139 US=1
State of birth Total number of states Top 2 of the majority	21 Kerala=54 Karnataka=32	19 (18+1) Andhra Pradesh=32 Karnataka=18	23 (22+1) Karnataka=82 Tamil Nadu=09
Domicile Total number of states Top 2 of the majority	18 Karnataka=44 Kerala=41	18 (16+2) Andhra Pradesh=30 Karnataka=16	19 (17+2) Karnataka=94 Andhra Pradesh=5

below is obtained by analysing closed-ended questions, namely Likert-scale and responses and yes/no responses. The qualitative data are obtained by analysing open-ended questions that were a part of further probing of reasons for the yes/no responses for a few questions. The qualitative data is expressed as quotes/themes with quotes under each section. Since the data were collected using a questionnaire, additional information on the number of students who expressed such opinions from each college is provided in Table 3 to add value to the qualitative data.

Effective integration of the programme

Most of the students (86%–98%) from all three medical colleges agreed that ethical issues were effectively integrated into the Physiology curriculum. [College A=144 (98%) (M=55, F=89); College B=110 (91.7%) (M=49, F=61); College C=119 (85.6%) (M=31, F=88)]. There was significant difference across the colleges (p=0.003) with majority of College A students agreeing (98%).

Interference with physiology teaching

About 59% to 66% of the students across the three colleges felt that these sessions on ethics did not interfere with the physiology teaching [College A=87 (59.6%) (M=32, F=55) College B=79 (66.4%) (M=34, F=45) College C=84 (60%) (M=24, F=60)]. 20%–29% felt that it interfered with few classes [College A=39 (26.5%) (M=19, F=20); College B=25 (20.8%) (M=16, F=9); College C=40 (28.6%) M=16, F=24)] and 11%–14% of the students across the three colleges felt it interfered with most of the regular teaching schedules [College A=20 (13.6%)

Table 3

Description of the qualitative data

Question	Responses	College A n=147	College B n=120	College C n=140
1. Do you think this integrated ethics programme was relevant for you during the I MBBS course? *	Yes/no response	Yes=144 (M=54, F=90) No=3	Yes=112 (M=51, F=61) No=8	Yes=129 (M=39, F=90) No=11
	Number of responders (who expressed reasons)	124	94	119
	Reasons for responses derived from open-ended questions	(% of responses)		
	▸ Essential for medical profession and right time of exposure	20	13	14
	▸ Ethical medical practice	56	65	42
	▸ Ethics – integral to the course	23	18	37
	▸ Too early an exposure	1	4	7
	Number of non-responders (who did not express reasons)	23	26	21
2. Do you think continuing a programme where ethics is integrated into specific subject teaching in the future years of your MBBS course is relevant? *	Yes/no response	Yes=130 (M=46, F=84) No=17	Yes=113 (M=53, F=60) No=7	Yes=137 (M=43, F=94) No=3
	Number of responders who expressed reasons	137	80	112
	Reasons for responses derived from open-ended questions:	(% of responses)		
	▸ To strengthen ethical medical practice	51	49	53
	▸ To improve ethical knowledge	47	50	46
	▸ Intuitive to medical practice	2	1	1
	Number of non-responders (who did not express reasons)	10	40	28
3. Do you want the ethics sessions to be included in the formative/ summative assessment (internal assessments/ university exams)? *	Yes/no response	Yes=62 (M=24, F=38) No=85	Yes=64 (M=32, F=32) No=56	Yes=72 (M=21, F=51) No=68
	Number of responders who expressed reasons	122	75	103
	Reasons for responses	(% of responses)		
	▸ Mandate dilutes interest	59	38	37
	▸ Improves perception and increases involvement	19	45	42
	▸ Increases course burden	16	6	7
	▸ Assessment would not change the perception of ethics	6	11	14
	Number of non-responders (who did not express reasons)	25	45	37
4. What did you like most about the programme?	Number of responses	139	97	126
		(% of responses)		
	▸ Good exposure to challenges and ethical dilemmas in medical practice	35	45	45
	▸ Thought-provoking, interactive and relevant	31	27	30
	▸ Made them more humane	34	28	25
	Number of non-responders (who did not express reasons)	8	23	14
5. What did you not like about the programme?	Number of responses	125	78	87
		(% of responses)		
	▸ Short sessions with less student involvement	15	35	28
	▸ Extended sessions with no uniformity	19	5	17
	▸ Needs to be prescriptive	18	6	6
	▸ Others (majority stated that there were no dislikes and they felt the sessions were good)	48	54	49
	Number of non-responders (who did not express reasons)	22	42	53
6. Who do you think are the best people to teach ethics/ learn ethics from?	Number of responses	141	107	117
		(% of responses)		
	▸ Experienced doctors	53	39	50
	▸ Faculty of physiology	14	35	14
	▸ Parents and teachers	15	23	18
	▸ Others (ethicists, elders, etc)	18	3	18
	Number of non-responders (who did not express reasons)	6	13	23

** Questions with yes/no response and to give reason for their response*

(M=5, F=15); College B=15 (12.5%) (M=7, F=8); College C=16 (11.4%) (M=5, F=11)]. The responses were not significantly different across the colleges.

Relevance of the programme during I MBBS course

About 92%–98% of the students felt that the programme was relevant for them during I MBBS with no significant difference in responses across colleges. When probed further, they gave several reasons for this, which could be grouped under the following themes. (Table 3 provides the quantitative data for the same.)

- *Essential for medical profession and right time of exposure*: The students felt that these sessions added knowledge in ethics from the very beginning of their course, which was essential for their profession. They felt that it should therefore not be an "add-on" segment but an integral part of the course. They also felt that the timing was "apt".

  "These sessions, they help us understand ethical issues doctors would face…. Very much required for our profession." (College C)

  "During the course of medicine, we actually feel it is necessary to learn the basics of ethics because that's what matters for a good doctor." (College A)

  "Overall, it has touched the sensitive minds at the right time." (College C observer)

- *Ethical medical practice*: The students expressed the view that the training could lead to better ethical practice in the profession.

  "These sessions help us imbibe values which will help us become 'good' doctors." (College B)

  "Because it puts us in real-life scenarios and tells us that becoming a clinician is noonly about knowledge but also about being ethical." (College A)

- *Ethics – integral to the course*: Many students opined that training related to ethics should be an integral part of the medical profession. Thus, these sessions become important during the course.

  "Ethics and medicine go so much hand in hand; being ethical is a part of medical practice." (College C)

Some students whose response was that the sessions on ethics were not relevant for I MBBS gave the following reason:

- *Too early an exposure*: A few students opined that the exposure to sessions on ethics may be "too early" as they have no clinical exposure yet and so at times it becomes difficult to relate to the situations described.

  "Too early for us…maybe once we go to clinics, we will be able to relate to these sessions better…" (College C)

Relevance of the programme for future years

About 88%–98% students felt that continuing a similar programme where ethics is integrated into a specific subject in the future years (2nd, 3rd, 4th years) of MBBS course was relevant. There was significant difference in responses across the colleges (p=0.004). Students from College C were more supportive, followed by College B and College A. When probed for reasons for this feedback, the students gave the following reasons. (Table 3 provides the quantitative data with the reasons given).

Students who responded that the integrated sessions on ethics were relevant for future years provided the following reasons:

- *Strengthens ethical medical practice*: Students expressed that like medical education, developing ethical awareness is an ongoing process. Being constantly exposed to the clinical set up may numb students to the ethical side of clinical practice. Therefore, they felt that constant triggers throughout their undergraduate years may preserve the ideals learnt and help them develop a stronger ethical code in their future.

  "Being a doctor is a lifelong process; this programme should be continued as we should never forget the purpose of our job and the role of ethics in our profession." (College A).

  "Yes, it would be helpful. Among subjects we study, we get lost in them. We fail to think rationally, for the patient. We would take them as case studies and forget they are human beings." (College A)

  "Ethics when integrated along the years of moulding into a doctor will always help one at the end of their course to be a good doctor who is considerate and understanding to their patients." (College B)

  "To keep reminding us constantly about ethics incorporates it at a subconscious level." (College C)

- *Improves ethical awareness*: The students felt that ethical issues faced by them will vary according to the several clinical subjects introduced in future years. Continuing sessions on ethics in these years will equip students with the knowledge and understanding required to manage such situations. Hence, they opined that they would be prepared not just for their undergraduate life in the clinics but for a career in medical practice as well.

  "Yes, because we'll have to deal with patients from now on till the end of our profession. So there is no end to stop learning ethics. It is really nice to continue." (College A)

  "Ethics is not something confined to the curriculum of one subject. So according to me ethics should be integrated with other subjects also." (College B)

Students who opined that an ethics programme was not relevant for their future practice mentioned the following reasons:

- *Intuitive to medical practice*: Some students expressed the view that exposure to sessions on ethics throughout their medical course was not necessary. They reasoned that being new to ethical issues in the first year, they would enter the clinical set-up in the future years and be directly exposed to ethical dilemmas. Students would develop their own ideas of ethical practice as a consequence of experiencing different scenarios first hand and sharing these experiences with their peers. Hence, continued

sessions on ethics in future years seemed unnecessary.

"There is no reason for special classes, it [ethics] can be learnt from experiences of ourselves and colleagues." (College C)

"Dealing with patients, we will automatically learn about ethics." (College A)

Inclusion of the programme for evaluation in the formative/ summative assessment

There was a mixed response when the students were asked if these sessions on ethics should be included in the formative/ summative assessment (internal assessments/university exams). About 43%–55% of students felt it should be included. They opined that it would increase the students' involvement in the course. 45%–57% of them felt it should not be a part of assessment (Table 3). There were no significant differences across the colleges.

When probed further, the students who felt that Ethics should not be included in the formative/summative assessment expressed the following reasons for their responses (quantitative data: Table 3).

- *Mandate dilutes interest*: Most students believed that attending sessions on ethics was a matter of interest. Some argued that tagging the sessions with an assessment would automatically reduce this interest. They would then treat the sessions as just another "subject" and attend them to only gain the ideal answers that would ensure them passing or scoring well in the assessment. The retention of the ideas gained through the sessions would be short-term and it would also discourage free thinking among them.

  "The interest of learning will be pressurised by the name of EXAM, which is actually killing the interest of students." (College A)

  "Because examination cannot help us to understand this subject and we will slowly lose interest." (College B)

  "Each person has a different way of thinking either in positive or negative regarding a particular case. When it comes to examination, everyone tries to write the positive way of answering." (College A)

  "Students will study it as another subject and answer in socially desirable way to get marks." (College A)

  "Ethics, moral values are to be understood, cannot be judged/tested." (College C)

- *Increases the course burden*: Including ethics course for assessment would add to the already vast burden of the medical course.

  "Having an internal assessment would just increase our already heavy and vast syllabus. I definitely feel it isn't a very good idea." (College A)

  "I enjoyed the classes and understood the importance of the sessions, but I don't think it needs to be evaluated and add extra load on us." (College C)

Students who felt that the ethics programme should be included in the assessments expressed the following views:

- *Improves perception and increases involvement*: As every student gives importance to examinations, a lot of students were of the view that adding assessments to the course would increase their involvement. There would be increased attendance in the sessions, with a more earnest participation by the students. Having an assessment alongside their regular subjects would increase credibility of the course and students would lay equal emphasis on both aspects of the course.

  "This will give students one more reason to take this subject seriously, giving value to it." (College B)

  "It would be more than a subjective experience. It would show the importance of ethics along with science." (College C)

A few students took a neutral stand, stating that including assessments would not make a difference.

- *Assessment would not change perception of ethics*: The students participated because they were interested and enjoyed the discussions and debates that came with each session. They believed that their perceptions of the issues discussed would remain the same regardless of whether they were judged at the end of the course.

  "As I always like ethics class, taking an exam won't make a difference." (College A)

  "Anyways I took it seriously. It does not matter if it was part of my exam or not." (College C)

Likes, dislikes regarding the programme

A majority of the students stated that there were no features to dislike and they felt the sessions were good (Quantitative data in Table 3). When probed further for reasons for their likes/ dislikes they expressed the following opinions:

Reasons for which the students "liked" the programme:

- *Good exposure to challenges and ethical dilemmas in medical practice*: Students opined that the sessions dealt with a wide range of issues with ethical dilemmas which they might face in future, and made them think and discuss the possible ways they could be dealt with.

  "It made me think about dilemmas that I might face as a doctor…" (College A)

- *Thought-provoking, interactive and relevant*:

  "It was thought-provoking, made me think." (College A)
  "It gives liberty for inner voice…lots of interactions, discussions…" (College B)
  "It helps you think out of the box." (College-C)
  "It was an eye opener." (College C)

- *Made them more humane:* The students said that the sessions on ethics introduced them to various ethical scenarios most of which left them thinking even after the sessions ended. The final result, most students opined, was that it made them more humane which was required for their profession.

  "Made me more insightful… feel… feel compassionate about my patients…" (College B)

"These ethics sessions made me begin to understand what the patients go through… I think it made me more humane as a person." (College A)

Reasons for which the students "disliked" the programme:

- *Short sessions with less student involvement*: Some students expressed the view that the duration of the sessions was too brief which limited the students' interactions and discussions. They expressed the view that a few students may take longer to begin to share and the sessions did not cater to their needs.

  "Time was too short…duration should be increased so that more interactions and discussions can happen…" (College C)

- *Extended sessions with no uniformity*:

  "We did not like the non-uniformity of the programme in terms of timing." (College B)

- *Needs to be prescriptive*: While most of the students liked the challenge of being confronted with ethical dilemmas during these sessions which stimulated their thinking, a few of them did not like this structure of the programme. They expected the faculty to give them clear solutions.

  "I did not like the end of the sessions as I was left in a dilemma … to think further… They should have given clear cut solutions…" (College A)

Teaching/learning ethics

The students felt that "experienced doctors", "Physiology faculty" and "teachers" were best suited to teach Ethics in response to the question they were asked as to who the best people were to teach ethics/learn ethics from. The students stated that they had also imbibed ethical values from their parents, by way of informal learning (Table 3). However, the mention of "Physiology faculty" might be because they have seen integration of Ethics in teaching only in Physiology. Taking this forward, it would be a good idea to involve anatomists and biochemists as well to make the integration horizontal, and to make future efforts more meaningful (Table 3).

Ethics – taught and learnt: When students were asked as to what extent do they believe that ethics could be taught and learnt, 57%–70% of the students across colleges felt a great deal/lots can be learned through teaching. However, there was a significant difference (p=0.04) in the response with College C ranking first [n=98 (70%); (M=23, F=75)] followed by College B [67(57.3%) (M=34, F=33)] and College A [101(69.2%) (M=37, F=64); p=0.04].

Ethics – imbibed by observing behaviour: About 61%–79% of students across the three colleges felt that ethics is imbibed by observing the behaviour of people around them. There was a significant difference in the response across colleges with the highest number of students of College A [n=114 (78.6%) (M=39, F=75)] believing that a great deal/lot of it learnt by observation, followed by College C [n=105 (75%) (M=78, F=27)] and College B [n=70(60.9%) (M=28, F=42)] (p=0.002).

"Ethics is not a subject to be taught, it should be built up on our own." (College B).

Ethics as a distractor from the science of Physiology or Medicine: About 90%–97% of the students across the three colleges opined that the integrated ethics classes were not a distracter from the science of physiology, or medicine [College A=134 (92.4%) (M=50, F=84); College B=106 (90.6%) (M=47, F=59); College C=135 (97.1%) (M=42, F=93)]. There was no significant difference in responses across the colleges.

"Ethics and medicine goes hand in hand." (College C)

"Science+ethics = society's development." (College A) About 3%–14% of the students felt integrated ethics classes was a distractor, they reason being *"too many soft skills make it difficult for a doctor to handle critical issues." (College B)*

Does ethics make one a weak human being?

About 85%–95% of students disagreed with the argument that "ethics makes one a weak human being". There was a significant difference (p=0.037) in responses across colleges with highest in College C [n=131 (94.9%) (M=42, F=89)], followed by College A [n=126 (88.7%) (M=45, F=81)] and College B [n=100(85.5%); (M=42, F=58); p=0.037.

"Ethics makes human being complete, reflective, responsible human beings and teaches humanity." (College C)

"Ethics makes us compassionate and being compassionate and emotional is not equal to being weak." (College B)

"Weak and humane are not synonymous." (College A)

"Ethics makes us more emotional and being emotional is weak."(College A)

"Being ethical brings in confusion over choices and decisions."(College B)

Comparison across colleges

In summary, a significantly greater number of students from College A, as compared to the other two colleges, agreed that there was an effective integration of the programme into the physiology course (p=0.003) and that ethics can be imbibed by observing behaviours (p=0.002). Greater numbers of students from College C as compared to the other two colleges opined that the integrated ethics programme needs to be continue during the future years of their MBBS course (p=0.004), that ethics can be best learnt through teaching learning methods (p=0.04), and that ethics does not make one a weak human being (p=0.037).

Gender differences in responses with pooled data

The pooled data from across the colleges were analysed for any gender differences in feedback [(n=407; F=247 (60.7%); M=160 (39.3%)]. A total of 238 (96.7%) females felt that ethical issues were effectively integrated into the physiology course, which was significantly greater as compared to the number of males 135 (84.4%) (p<0.001). Again, a larger number of females [n=241 (97.6%)] felt that an integrated ethics programme was relevant for I MBBS as compared to males [n=144 (90%)] (p=0.002). The same trend was observed in the opinion that the programme needs to be continued for the future years of the medical course [F=238 (96.7%); M= 142 (88.8) p=0.003]. More females n=184 (74.5%) believed that a great deal of

ethics is imbibed by observing behaviour as compared to males n=105 (68.6%); p=0.02. Again, a significantly larger number of females n=236 (95.9%) believed that sessions on ethics are not a distracter from the science of physiology or medicine as compared to males n=139 (89.7%) (p=0.023). Larger number of females n=228 (94.6%) believed that ethics does not make a human being weak as compared to males n=129 (82.7%) (p<0.001).

Multiple-choice questions aimed to test simple recall of the ethical issues dealt during each ethics session

Questions were converted into the binary type (true/false), the score for true was assigned as one and for false as zero. Then the sum of the scores of all the questions was standardised to a 100-point scale and mean percent scores were derived and compared across colleges and genders. The means were significantly different across the colleges with the highest number of College A students recalled (College A=57.9±1), followed by College C (College C=54.85±15.55) and College B (College B=46.07±18.38) (p<0.001). Comparison of the pooled data for variation across the gender showed that females (56.88±17.51) recalled better than males (47.28±17.89) (p<0.001).

Key ethical issues that had particular impact as recalled by the students

A total of 138 students from College A, 81 from College B and 121 from College C responded to this question. The ethical issues that had a particular impact on the students were informed consent (College A=14.5%, College B=17.28%, College C=16.53%); Anonymity and confidentiality of data (College A=5.78%, College B=2.47%, College C=1.65%); Issues related to animals and ethics (College A=18.84%, College B=29.63%, College C=22.31%); Issues related to clinical examination (College A=11.59%, College B=24.69%, College C=9.92%); Stigma (College A=19.57%, College B=12.35%, College C=18.18%); Issues related to end-of-life care (College A= 24.64%, College B=4.94%, College C=16.53 %); Issues of labeling a medical diagnosis (College A=5.07%, College B=8.64%, College C=14.88%).

Feedback on content, methods and uniformity of sessions

Most of the students across the three colleges felt that the content was, appropriate, sufficient and realistic and that they had no suggestions for improvement. *"I found it perfect" (College A).* Few opined that the "*Real case scenarios and more ethical issues could be discussed" (College C).* The contents and methods used were appreciated by the observers across the three medical colleges with some suggestions for improvement. "*Contents of session are just sufficient and appropriate to sensitise and tickle the minds of the UGs" (observer – College A).* Regarding the methods used for teaching, many students felt that no change was required. A few students and observers suggested short films, video clips, more debates and discussions among students, increased involvement of patients and clinicians in the discussions. "*The session did elicit good discussion from the UG students; in fact more discussions can be facilitated if time was not a limiting factor"(observer – College A). "Can be more effective with small group discussions" (College B).*

The students opined that the sessions were uniformly spread throughout the year; few felt that the sessions could be held more often (once in every 2 weeks).

Students expressed that there was a change in their perspective towards several of the ethical issues discussed during the "integrated ethics programme". *"There was a change in my perception of medical career: not a career of opportunity but a career of divinity and virtue" (College A). "My ethical viewpoint on stigma has become strong… and on consenting has become clear" (College C). "I learnt that communication matters in a doctor–patient relationship…." (College B).*

Feedback from the observers

The observers who attended the sessions in each of the medical colleges provided feedback on the content, methods, effectiveness of the session, relevance and some suggestions. They felt that the contents of the sessions were sufficient and appropriate. They opined that the students were engaged in discussions and messages were effectively communicated. They expressed that the programme was relevant, triggered thinking, created awareness on ethical issues and recognised the need to continue the programme (Table 4).

Discussion

Student participants and faculty observers from all the three institutions felt there was effective integration, which suggests that the programme could be used as a sample for an integrated course on ethics in the physiology setting. A significantly larger number of students from College A, who were simultaneously exposed to separate sessions on ethics, identified this programme to be effectively integrated into the physiology course as compared to the response from other institutions. This could be because they had a comparator in the stand-alone classes on ethics. Most of the students across the three colleges agreed that there was no interference with physiology teaching; while a few did mention that there was interference with some classes. This needs to be examined so as to tailor the sessions to the needs of individual colleges. There is a possibility that this could have been expressed by students who are academically weaker for whom the integration of ethics is a "luxury" they would prefer to do without. Both students and observers from the three institutions recognised the relevance of the programme. This is encouraging as it shows that young minds with heterogeneous origins in terms of place of birth, domicile and medical institutions and the faculty of different colleges do recognise the value of inclusion of integrated teaching of ethics for the medical profession from the very first year. They also felt the need of its continuance throughout medical training. Significantly greater number of College A students expressed that it was relevant in the first year and significantly greater number of students from College C expressed that integrated sessions on ethics should be continued throughout their medical training. This gives food for thought to incorporate sessions on ethics during bedside clinics in future years of the course, which is supported by other studies (4,9).

Table 4

Feedback from the observers

Contents
● "Contents of session are just sufficient and appropriate to sensitise and tickle the minds of the undergraduates." (College A)
Methods
● "Students were actively involved in the discussion on emotional issues involved in performing clinical examination." (College B)
● "Students were engaged in discussion." (College C)
● "The session did elicit good discussion from the UG students (in fact more discussions can be facilitated if time was not a limiting factor." (College A)
● "I could sense that all the students were engaged in the discussion." (College C)
Effectiveness of communication
● "Message was conveyed effectively, more so because it involved discussion with practical classes where the students were subjects themselves." (College A)
Relevance, thinking, awareness
● "Ethical issues involved in history-taking and clinical examination was well highlighted by playing video clips, which helped students to understand patients' privacy and respect are important things to be kept in mind while taking history and examination." (College B)
● "Right topic dealt with at a right time, probably this could ease out the way the boys felt they were objectified during practical classes and be more productive and sympathetic to their patients over the long run." (College A)
● "Overall it has touched the sensitive minds at the right time." (College A)
● "The session has definitely set off a thought process among the students regarding the ethical issues." (College C)
● "This session definitely created awareness about ethical issues among the students." (College C)
● "Sensitised the students as per the objectives." (College A)
Suggestions
● "Small group discussions might help better." (College A)
● "Can be more effective in small groups." (College B)

A significant number of students from all three colleges with the highest being from College C, followed by College B (both of which did not have formal separate classes on ethics) felt that much ethics can be taught and learnt. Their expression of the need for formal teaching of ethics voices the students' willingness to learn from such classes. This is in line with the need recognised by MCI in the Vision document 2015 (10) and needs attention of the medical colleges for vigorous implementation of the same.

Further, the students from all three colleges felt that ethics can also be imbibed by observing behaviour, with the College A ranking highest, which shows the role of the "Hidden curriculum" especially in developing attitude, behaviour and ethical values during medical training (23).

A large majority of students across the three colleges felt that Ethics is not a distractor from Medicine and that it does not make one a weak human being, with the highest number of students from College C saying this. This is a positive finding considering the inseparable role of ethics in our lives and profession (1,24).

To summarise, the significant differences shown in the results of comparison of feedback across colleges imply that the opinion of students regarding introduction of the new programme was not totally unanimous. This gives us an insight into the differences in the perceptions of the heterogeneous group of students. This provides us with scope for improvement of the contents, structure and design of the programme to cater the needs of a wider student population.

Gender differences of the pooled data show significant difference in responses. A greater number of females seem to recognise the need for discussion on ethical issues during medical training and also believe that ethics could be learnt by observing behaviour, which is a new finding. Comparison across gender (given the large sample size) gives an insight into the fact that there is a possibility of difference in perception of such a programme across genders, which helps in tailoring the structure of the programme to have an effective impact on both genders.

The feedback from the observers were positive in terms of relevance, contents, methods and students' involvement, which suggests that the faculty who were from several other departments of the respective institutions also recognised the need for such an integrated ethics programme in the medical course. This is encouraging in terms of continuation and extension of the programme in future years. Future attempts would also aim at extending the integrated teaching of ethics as horizontal integration during the first year so that the students are exposed to the discussion on ethical issues across all subjects.

Limitations

Some methodological limitations need to be mentioned. Despite the investigators' efforts, we could find volunteers from just a couple of colleges, which left the investigators to go ahead with only that number. However, the investigators went ahead in conducting the scale-up study with the determination to start with the colleges that had volunteered and publish the data which could become a trigger for such a programme to begin at many more institutions. Further, no government medical college was included in the study, as the faculty attending the workshop from these colleges hesitated to volunteer although they were personally interested. The reason mentioned by these faculty members for not participating in the project was "Possible lack of buy-in from the faculty within a department and from the managements of institutions, both private and especially government, since the MCI has still not mandated such integration" as shared by them during the workshop (22). The use of a semi-structured questionnaire for the student feedback without a formal qualitative component does not allow us to explain the findings fully. There is a tendency for students to provide positive responses on a fixed feedback questionnaire. We cannot comment on the opinion of the non-responders. We can only comment on the eight sessions of the integrated ethics programme, which could be extended to cover other issues in future years.

Conclusions

Feedback from the students aided in understanding the feasibility, relevance, prospects, merits and demerits with comparison of responses across colleges. The results of our study reflect the opinions of heterogeneous group of students belonging to various states in the country and to three different medical colleges in the state. The scale-up study of integrating the ethics programme into the physiology course was well received and was found to be feasible, relevant and beneficial by students and faculty observers across the three medical colleges.

Acknowledgements: *We thank the students of the I MBBS batch of 2016–17 and faculty who came as observers of all three medical colleges for being a part of the programme and providing their valuable feedback. We thank Dr Mario Vaz, Professor of Physiology, St John's Medical College, for his critical comments and review of the manuscript. Financial support: none*

References

1. Fox E, Arnold RM, Brody B. Medical ethics education: past, present, and future. *Acad Med.* 1995;70:761–9.
2. Johnston C, Haughton P. Medical students' perceptions of their ethics teaching. *J Med Ethics.* 2007;33:418–22. doi:10.1136/jme.2006.018010.
3. Lakhan SE, Hamlat E, McNamee T, Laird C. Time for a unified approach to medical ethics. *Philos Ethics Humanit Med.* 2009;4:13. doi:10.1186/1747-5341-4-13.
4. Miyasaka M, Akabayashi A, Kai I, Ohi G. An international survey of medical ethics curricula in Asia. *J Med Ethics.* 1999;25:514–21. doi:10.1136/jme.25.6.514.
5. Miles SH, Lane LW, Bickel J, Walker RM, Cassel CK. Medical ethics education: coming of age. *Acad Med.* 1989;64:705–14. doi:10.1097/00001888-198912000-00004.
6. Narayanan R, Narayanan T, Tekur SP. Strategies for Greater Community Orientation and Social Relevance in Medical Education–Building on the Indian Experience. Bangalore, India: Community Health Cell; 1993:65–6.
7. Savitha D, Vaz M, Vaz M. "Thinking ethics": a novel, pilot, proof-of-concept programme of integrating ethics into the Physiology curriculum in South India. *Adv Physiol Educ.* 2017;41(2):306–11. doi:10.1152/advan.00183.2016.
8. Goswami N, Batzel JJ, Hinghofer-Szalkay H. Assessing formal teaching of ethics in physiology: an empirical survey, patterns, and recommendations. *Adv Physiol Educ*. 2012;36(3):188–191. doi:10.1152/advan.00010.2012.
9. Sokol DK. William Osler and the jubjub of ethics; or how to teach medical ethics in the 21st century. *J R Soc Med.* 2007;100(12):544–6. doi:10.1258/jrsm.100.12.544.
10. Medical Council of India. Vision 2015 [cited 2018 May 23]. Available from: https://www.mciindia.org/CMS/wp-content/uploads/2018/01MCI_booklet.pdf
11. Mitra J, Saha I. Attitude and communication module in medical curriculum: rationality and challenges. *Indian J Public Health*. 2016;60(2):95–8. doi:10.4103/0019-57X.184537.
12. Post Graduate Diploma in Medical Law and Ethics (PGDMLE) at National Law School of India University, Bangalore [2018 Jan 10]. Available from: https://nls.ac.in
13. Bioethics certificate course conducted by the Centre for Bioethics, Manipal University, Manipal [cited 2018 Jan 10]. Available from:
14. http://www.icmr.nic.in/icmrnews/course/BCC-II%20brochure%202016.pdf
15. Postgraduate Diploma in Bioethics and Medical ethics (PGDBEME). One-year Distance Education Program at Center for Ethics, Yenepoya University, Mangalore [cited 2018 Jan 10]. Available from:
16. http://www.yenepoya.edu.in/downloads/PGDBEME2017.pdf
17. Postgraduate Diploma in Bioethics (PGDBE). One-year Distance Education Program at PSG Center for Research and Bioethics, PSG Institute of Medical Sciences and Research (PSGIMSR), Coimbatore [cited 2018 Jan 10]. Available from:
18. http://www.icmr.nic.in
19. Guild S, Gunther MS. Patient perspectives program: a humanistic educational experience for medical students. *Arch Phys Med Rehabil.* 1981;62(9):461–6.
20. Wolf TM, Balson PM, Faucett JM, Randall HM. A retrospective study of attitude change during medical education. *Med Educ.* 1989;23(1):19–23. doi:10.1111/j.1365-2923.1989.tb00807.x.
21. Weibel ER. The Physiologist's Ethical Dilemmas. *News Physiol Sci.* 2002;17:43–6.
22. Benos DJ. Ethics, revisited. *Adv Physiol Educ.* 2001;25(1–4):189–90.
23. Rameshkumar K. Ethics in medical curriculum; Ethics by the teachers for students and society. *Indian J Urol.* 2009;25(3):337–9. doi: 10.4103/0970-1591.56192.
24. Ravindran GD, Kalam T, Lewin S, Pais P. Teaching medical ethics in a medical college in India. *Natl Med J India.* 1997;10(6):288–9.
25. Savitha D, Vaz M, Timms O, Ravindran GD, Vaz M. On the integration of ethics into the physiology curriculum. *Indian J Med Ethics*. 2017;2(4):293–5 DOI: 10.20529/IJME.2017.077
26. Lempp H, Seale C. The hidden curriculum in undergraduate medical education: qualitative study of medical students' perceptions of teaching. *BMJ.* 2004;329(7469):770–3.
27. Eckles RE, Meslin EM, Gaffney M, Helft PR. Medical ethics education: where are we? Where should we be going? A review. *Acad Med.* 2005;80(12):1143–52. doi:10.1097/00001888-200512000-00020.