

Original Research Article

Medical students and the National Medical Commission bill: negativity and misinformation combine

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ABSTRACT

Background: The National Medical Commission bill (NMC bill) was drafted in response to concerns regarding medical education and healthcare in India. It seeks to reform medical education in India. However, a storm of protests by medical students and doctors erupted after it was tabled in parliament. This study was conducted to determine medical students' knowledge of, and attitude towards the NMC bill.

Methods: This cross-sectional study was conducted among medical students in a private medical college in south India. A tool based on each section of the NMC bill was developed to assess knowledge. Attitude was assessed using a 5-point Likert scale. Separate knowledge and attitude scores were computed. Statistical analyses were performed using EZR (version 1.36). Descriptive statistics, Chi-square test, logistic regression analyses were performed.

Results: Only 74 (31.49%) had adequate knowledge of the NMC bill. The major source of information regarding the NMC Bill was social media (191; 81.28%), followed by newspapers (107; 45.53%). Those who were aware of the amendments to the bill; and who received information about the bill from newspapers were significantly more likely to have adequate knowledge. Participation in IMA protest rally was significantly associated with negative attitude; belonging to main (regular) batch was significantly associated with positive attitude towards the bill. Superior knowledge was not associated with positive attitude towards the bill.

Conclusions: Medical students lack knowledge about the NMC bill, but have strong negative attitude towards it. Negative attitude is significantly associated with participation in IMA protest rally against NMC bill.

Keywords: Medical students, National medical commission bill, Protest, Knowledge, Attitude

INTRODUCTION

The National Medical Commission bill (NMC bill) was drafted in response to numerous concerns regarding the status of medical education and health care in India.¹⁻¹⁵ It seeks to improve the standards of medical training, as well as address inequities in availability of trained healthcare professionals within the country.^{16,17} Despite its reformist intentions, the NMC bill has been the subject of several protests by medical students and doctors across

the country, with the Indian Medical Association (IMA) leading the offensive.¹⁸⁻²⁴

Despite the outrage, medical students seemed unfamiliar with actual content of the NMC bill. Therefore, we wanted to determine 1. The knowledge of, and attitude towards the NMC bill; 2. The factors influencing knowledge and attitude of medical students regarding the NMC bill.

METHODS

This cross-sectional study was conducted among 235 consenting medical students and interns of a private medical college in Kerala from April 2018 to May 2018, after obtaining permission from the Head of the department. The study was conducted using an anonymous, semi-structured questionnaire based on the NMC bill that included basic socio-demographic variables, and included questions from each section of the Bill as introduced in parliament, and the amendments introduced later.^{16,25} In addition, respondents were asked if they were members of the Indian Medical Association Medical Student Network (IMA-MSN); and if they had participated in a protest rally organised by Indian Medical Association (IMA).²⁰

Sample size calculation was performed using the formula $n=4pq/l^2$ where p: prevalence; q: (100-p); and l: 20% of p. We hypothesized that only 30% of respondents would have adequate knowledge regarding the NMC bill. This yielded a sample size of 233, which was rounded up to 235. We employed stratified random sampling (with each year of study taken as a stratum), and systematic random sampling within each stratum. First MBBS students were excluded from the study as they were undergoing internal examination at the time.

Data were entered in Microsoft Office Excel 2013, and analysed using EZR (version 1.37).²⁶⁻²⁸ In addition to

descriptive statistics, independent samples t- test, chi-square test and logistic regression analyses were performed. Statistical significance was set at the 5% level.

RESULTS

Of the respondents, 85 (36.2%) were male, while 150 (63.8%) were female. Main batch students (156; 66.4%) outnumbered those from supplementary batches (76; 33.6%). Almost equal proportion of respondents had secured admission through merit (118; 50.2%) and management (117; 49.8%) quota. There were 51 (21.7%); 46 (19.6%); 69 (29.4%); and 69 (29.4%) respondents from II MBBS, Final MBBS part 1, Final MBBS part 2, and internship respectively. Although 188 (80%) of respondents were not members of IMA-MSN, 122 (51.9%) had participated in the protest rally organised by IMA. Responses to items in questionnaire are presented in Table 1.

Respondents were asked why/ why not it was necessary to replace MCI, depending upon their response to the main question. Of the 21 who stated that it was necessary to replace MCI, 19 (90.47%) claimed that MCI had failed to improve standards and quality of medical education. In contrast, 187 (95.9%) of those who stated that it was not necessary to replace MCI, claimed that there is no problem with the functioning of MCI.

Table 1: Responses to knowledge questions based on original and amended NMC bill.

Items based on original NMC bill			
Item	Response n (%) [N=235]		
	Yes	No	Don't know
Is it necessary to replace MCI?	21 (8.94)	195 (82.98)	19 (8.09)
Will NMC solve existing problems in medical education?	10 (4.26)	189 (80.43)	36 (15.32)
National licentiate exam (NEXT) will act as a gateway for			
i. Granting licence to practice medicine	165 (70.21)	38 (16.17)	32 (13.62)
ii. Enrolment in state/national register	95 (40.43)	32 (13.62)	108 (45.96)
Provision for bridge course for AYUSH practitioners present	172 (73.19)	46 (19.57)	17 (7.23)
NMC bill provides for fee regulation in private medical colleges	103 (43.83)	30 (12.77)	102 (43.40)
Assessment of medical institution will be done by Medical Assessment & Rating Board (MARB)	77 (32.77)	20 (8.51)	138 (58.72)
Penalty for unregistered practitioners: ₹1-5 lakh	41 (17.45)	12 (5.11)	182 (77.45)
Foreign medical graduates/practitioners will be allowed to practice medicine without passing screening test	96 (40.85)	97 (41.28)	42 (17.87)
Items based on amended NMC bill			
Item	Response n (%) [N=169]*		
	True	False	
Final MBBS exam will serve as National exit test	124 (73.37)	45 (26.63)	
Provision for bridge course for AYUSH practitioners removed	107 (63.31)	62 (36.69)	
Fee regulation in 50% seats in private medical colleges and universities	40 (23.67)	129 (76.33)	

*Of the respondents, only 169 claimed to be aware of the amendments made to the NMC bill. Therefore, these questions were directed only to them.

Table 2: Chi-square test results of knowledge with selected factors.

Variable	Level	Knowledge score n (%)		P value
		6 (50%) or more	<6 (<50%)	
Admission	Merit	46 (62.2)	72 (44.7)	0.01
	Management	28 (37.8)	89 (55.3)	
IMA-MSN member	Yes	11 (14.9)	36 (22.4)	0.22
	No	63 (85.1)	125 (77.6)	
Participated in IMA protest rally	Yes	33 (44.6)	88 (54.7)	0.16
	No	41 (55.4)	73 (45.3)	
Read NMC bill	Yes	33 (44.6)	48 (29.8)	0.03
	No	41 (55.4)	113 (70.2)	
Aware of changes in NMC bill	Yes	72 (97.3)	97 (60.2)	<0.001
	No	2 (2.7)	64 (39.8)	
Year of study	II MBBS	15 (20.3)	36 (22.4)	0.004
	III MBBS Part 1	8 (10.8)	38 (23.6)	
	III MBBS Part 2	33 (44.6)	36 (22.4)	
	Intern	18 (24.3)	51 (31.7)	
Sex	Male	28 (37.8)	57 (35.4)	0.77
	Female	46 (62.2)	104 (64.6)	
Student type	Regular batch	52 (70.3)	104 (64.6)	0.45
	Supplementary	22 (29.7)	57 (35.4)	
Source of information				
Newspaper	Yes	43 (58.1)	64 (39.8)	0.01
	No	31 (41.9)	97 (60.2)	
Social media	Yes	64 (86.5)	127 (78.9)	0.20
	No	10 (13.5)	34 (21.1)	
Television	Yes	23 (31.1)	25 (15.5)	0.009
	No	51 (68.9)	136 (84.5)	
Friends	Yes	28 (37.8)	54 (33.5)	0.55
	No	46 (62.2)	107 (66.5)	

Table 3: Responses to attitude questions regarding the NMC bill.

Item	Response n (%)				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
NMC favours private medical colleges	12 (5.11)	42 (17.87)	94 (40)	58 (24.68)	29 (12.34)
NMC will provide high quality, high standard in medical education	73 (31.06)	86 (36.60)	52 (22.13)	24 (10.21)	0 (0)
Exit exam will ensure minimum standard in all medical graduates regardless of institution	59 (25.21)	74 (31.62)	60 (25.64)	24 (10.26)	17 (7.26)
Provision of bridge course for AYUSH will fill gaps in availability of trained healthcare personnel in rural areas	132 (56.17)	63 (26.81)	28 (11.91)	9 (3.83)	3 (1.28)
Licentiate exam would serve as screening test for doctors with foreign medical qualifications	31 (13.19)	48 (20.43)	70 (29.79)	66 (28.09)	20 (8.51)

Those who responded in the affirmative to the question whether NMC provides for fee regulation in private medical colleges were asked the extent of such regulation. Of the 103 who agreed that there was provision for fee regulation, 29 (27.36%) stated that fee regulation extended to 60% of seats; 6 (5.66%) stated that it was unregulated; while 71 (66.98%) didn't know the exact details.

Only 81 (34.47%) of the respondents claimed to have read the NMC bill. Of these, only 7 (8.75%) had read the full Bill document, while the remaining 73 (91.25%) claimed to have read parts of the same. The major source of information regarding the NMC Bill was social media (191; 81.28%), followed by newspapers (107; 45.53%), friends (82; 34.89%), and television (48; 20.43%).

Of the 235 respondents, 169 (71.91%) claimed that they were aware of amendments made to the NMC bill. These respondents were asked three additional questions regarding the amendments. A knowledge score was computed based on the responses to the twelve knowledge questions, with each correct response awarded one point, and incorrect responses scored zero. A score of 6/12 (50%) was considered adequate knowledge, and was

achieved by 74 (31.49%) of respondents. The average knowledge score (Mean (SD)) was 4.64 (2.0), with a median of 4. Knowledge score was transformed into a binary variable with a score of 6 (50%) taken as the threshold. Only 74 (31.49%) had an adequate knowledge score of 6 (50%) or more. The results of bivariate analyses with the binary knowledge score as the dependent variable are presented in Table 2.

Table 4: Chi-square test results of attitude towards NMC bill with selected factors.

Variable	Level	Attitude score n (%)		P value
		3 or more	2 or less	
Admission	Merit	16 (72.7)	12 (47.9)	0.04
	Management	6 (27.3)	111 (52.1)	
IMA-MSN member	Yes	3 (13.6)	44 (20.7)	0.58
	No	19 (86.4)	169 (79.3)	
Participated in IMA protest rally	Yes	5 (22.7)	116 (54.5)	0.006
	No	17 (77.3)	97 (45.5)	
Read NMC bill	Yes	6 (27.3)	75 (35.2)	0.63
	No	16 (72.7)	138 (64.8)	
Aware of changes in NMC bill	Yes	15 (68.2)	154 (72.3)	0.80
	No	7 (31.8)	59 (27.7)	
Year of study	II MBBS	2 (9.1)	49 (23.0)	0.04
	III MBBS Part 1	1 (4.5)	45 (21.1)	
	III MBBS Part 2	9 (40.9)	60 (28.2)	
	Intern	10 (45.5)	59 (27.7)	
Sex	Male	7 (31.8)	78 (36.6)	0.81
	Female	15 (68.2)	135 (63.4)	
Student type	Regular batch	20 (90.9)	136 (63.8)	0.009
	Supplementary	2 (9.1)	77 (36.2)	
Knowledge score	6 (50%) or more	8 (36.4)	66 (31.0)	0.78
	<6 (<50%)	14 (63.6)	147 (69.0)	
Source of information				
Newspaper	Yes	10 (45.5)	97 (45.5)	1.00
	No	12 (54.5)	116 (54.5)	
Social media	Yes	17 (77.3)	174 (81.7)	0.57
	No	5 (22.7)	39 (18.3)	
Television	Yes	4 (18.2)	44 (20.7)	1.00
	No	18 (81.8)	169 (79.3)	
Friends	Yes	7 (31.8)	75 (35.2)	0.81
	No	15 (68.2)	138 (64.8)	

Multiple logistic regression analysis was performed using the statistically significant factors identified from bivariate analyses as independent variables, and the transformed knowledge score as binary dependent variable. Those who were aware of new changes in the NMC bill (OR: 25.9, 95% CI: 5.9-112.0, $p < 0.0001$); and received information about NMC bill from newspapers (OR: 1.9, 95% CI: 1.01-3.61, $p = 0.046$) were significantly likely to have adequate knowledge about the same.

Since a substantial proportion of respondents were unaware of the new changes, we analysed knowledge by computing a knowledge score that was limited to items from the original NMC bill as well. Keeping a score of 5

(50%) as the threshold, only 56 (23.83%) of respondents had an adequate knowledge score. Using this binary knowledge score for bivariate analyses indicated that admission mode (merit/ management); year of study; and having read the NMC bill were significantly associated with adequate knowledge. Multiple logistic regression with knowledge score (transformed as a binary factor) as dependent variable, and the significant factors from bivariate analyses as independent variables was performed. Students admitted under the merit quota (OR: 2.82, 95% CI: 1.48-5.38, $p = 0.001$) were significantly likely to have adequate knowledge as compared to other students.

A 5-point Likert scale was used to assess attitudes towards NMC bill, with scale items ranging from strongly disagree through strongly agree. Responses to attitude questions are presented in Table 3. The responses to attitude questions were transformed to an attitude score, wherein responses in support of the NMC bill were scored higher. For instance, the item stating that NMC bill favours private medical colleges was scored as: any disagree (1); others (0). The scores for individual items were added to create a composite attitude score having minimum value of zero, and maximum value of five. The score was further transformed to create a binary variable, taking three as the threshold. Only 22 (9.36%) of the respondents had a favourable attitude (attitude score of 3 or more) towards the NMC bill. Results of bivariate analyses with the binary attitude score as dependent variable are presented in Table 4.

Multiple logistic regression with the transformed binary attitude score as dependent variable, and statistically significant variables from bivariate analyses as independent variables was performed. Those who participated in the IMA protest rally (OR: 0.28, 95% CI: 0.09-0.79, $p=0.017$) were significantly likely to have a negative attitude towards the NMC bill. However, respondents belonging to main (regular) batches (OR: 4.83, 95% CI: 1.09-21.50, $p=0.038$) were significantly likely to have a favourable attitude towards the bill.

DISCUSSION

In this study, only 21(8.94%) of respondents felt that it was necessary to replace the MCI, while 195(82.98%) did not believe it was necessary to do so. This sentiment is more likely a reflection of their unfamiliarity with the concerns and controversies involving the MCI, than a studied opinion.¹² Within the medical education and healthcare paradigms, medical students constitute beneficiaries of the system. They do not have to engage with the MCI while in that capacity. The administrative and policy issues stemming from decisions of the MCI mostly impact teaching faculty and administrators of medical institutions. Therefore, medical students are largely insulated from the MCI and its actions. Similarly, medical students are not concerned with policy matters at the national and state level, and are not obliged to be familiar with the condition of medical education in the national or international context.

Our findings are consistent with the initial assumption regarding medical students' knowledge of the NMC Bill-adequate knowledge was 31.49%, while our estimate was that the same would be 30%. Surprisingly, members of IMA Medical Students Network (IMA-MSN) and those who participated in the protest rally, both had low awareness of NMC bill (14.9% and 44.6% respectively). Since the IMA-MSN was instrumental in organising students' protest rallies, we expected members to have superior knowledge about the NMC Bill than others. Similarly, we assumed that those who participated in the

protest rally were doing so after fully understanding the Bill.

Considering that the bill will potentially transform medical education in India, medical students are expected to be familiar with all provisions of the bill. Their ignorance is both baffling and disturbing, since medical students were the most visible stakeholders protesting provisions of the bill.²⁰ In this context, it is interesting to note that only 34.47% of the respondents had read any part of the actual bill document, with a mere 8.75% having read the bill in its entirety. With 81.28% of respondents obtaining information about the bill from social media, it seems to be responsible for their misinformation (those who sourced their information from newspapers and television were significantly likely to have adequate knowledge about the bill on bivariate analyses). This may be explained by the need for newspapers and television channels to present verified facts, while social media networks are devoid of any such requirement. The ease of propagation of social media messages facilitates widespread dissemination of misinformation, and can easily drown the limited fact based reports on any topic.²⁹ Moreover, such (fake) messages tend to be transmitted with significantly higher frequency compared to legitimate messages, and gain credibility over time.³⁰⁻³² Nevertheless, one expects that medical students would be less susceptible to such 'misinformation networks', given the unrestricted access to the bill document online, as well as motivation to know the facts.³³ That such fact-checking was not performed in a matter that directly affects them, exposes their vulnerability to fake medical news pertaining to more mundane aspects of medical practice.

Unsurprisingly, the general attitude towards the NMC Bill was negative. However, the negativity was influenced by whether the respondent had participated in the IMA protest rally or not. Those who participated in the rally were significantly more likely to have a negative attitude towards the bill. We expected those who had good knowledge about the bill to have generally positive attitudes towards the same. However, only 8(10.8%) of those who had adequate knowledge about the bill also had a positive attitude towards it. Perhaps this is on account of the unrelenting negative coverage/ messages that followed the tabling of the bill in parliament. Since there were few countervailing voices, the dominant (negative) messages gained credence and acceptance.³⁴⁻³⁶ Later, although the government issued clarifications, it was insufficient to persuade those who had already decided that the dominant narrative was true.^{37,38} This is consistent with past events wherein factual clarifications by key authorities failed to change popular opinion regarding the veracity of fake news.³⁹

The finding that regular (main) batch students were more likely to have positive attitudes towards the bill is probably indicative of the greater negative attitude of supplementary batch students towards the bill than

anything else. It is quite natural for academically weaker students to experience greater anxiety about the bill, given its intention to improve standards. This makes them more likely to accept misinformation, and is probably independent of awareness regarding the bill.⁴⁰

To our knowledge, this is the first study to investigate the knowledge and attitude of medical students towards the NMC bill. Therefore, the study is limited by the absence of a validated tool, and other studies for comparison. However, the content validity of the tool might partially compensate for the absence of a validated tool with known psychometric properties.

CONCLUSION

Medical students are lacking in adequate knowledge of the NMC bill, yet have significantly negative attitudes towards the same. Knowledge of NMC bill is significantly influenced by awareness of the recent changes; and receiving information about the bill from newspapers. Negative attitude towards the bill is significantly associated with participation in IMA protest rally; while positive attitude is associated with belonging to regular (main) batches.

We recommend that similar studies be conducted in other medical colleges to determine if our findings are indicative of a general pattern, or a local phenomenon.

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