

BMJ Open Medical students' knowledge, attitudes and perceptions towards contraceptive use and counselling: a cross-sectional survey in Maharashtra, India

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ABSTRACT

Objectives: This study aimed to investigate the knowledge, attitudes and perceptions towards contraceptive use and counselling among medical students in Maharashtra, India.

Setting: Considerable global maternal mortality and morbidity could be avoided through the use of effective contraception. In India, contraception services are frequently unavailable or there are obstacles to obtaining modern, reversible contraceptives.

Participants: A cross-sectional descriptive study using a self-administered questionnaire was conducted among 1996 medical students in their fifth year of study at 27 medical colleges in the state of Maharashtra, India. Descriptive and analytical statistics interpreted the survey instrument and significant results were presented with 95% CI.

Results: Respondents expressed a desire to provide contraceptive services. A few students had experienced training in abortion care. There were misconceptions about modern contraceptive methods and the impact of sex education. Attitudes towards contraception were mainly positive, premarital counselling was supported and the influence of traditional values and negative provider attitudes on services was recognised. Gender, area of upbringing and type of medical college did not change the results.

Conclusions: Despite mostly positive attitudes towards modern contraceptives, sex education and family planning counselling, medical students in Maharashtra have misconceptions about modern methods of contraception. Preservice and in-service training in contraceptive counselling should be implemented in order to increase women's access to evidence-based maternal healthcare services.

INTRODUCTION

Contraceptive use is an effective primary prevention strategy for reducing maternal mortality.¹ It has been estimated that the use of effective contraception could avert 90% of abortion-related and more than 20% of

Strengths and limitations of this study

- This study contributes important evidence that may be used to revise basic medical education in contraceptive counselling and thus reduces maternal mortality related to unintended pregnancies in India.
- An important limitation with this study is the non-probability sampling technique applied which might reduce the external validity.
- The large sample size and the inclusion of medical students from public and semiurban settings strengthen the generalisability.

obstetric-related mortality globally.² Abortion incidence is inversely associated with the level of contraceptive use, especially where the fertility rates are stable.³ In addition, comprehensive sex education has the potential to prevent unintended pregnancies that lead to unsafe abortions.⁴ In order to meet the increasing demand for contraceptives and to ensure the sexual and reproductive health and rights of women, including the right to planned parenthood, intensified efforts are urgently needed.⁵

India accounts for 20% of maternal deaths worldwide.⁶ Despite the fact that induced abortion has been legal in India since 1971, most of the approximately 6.7 million annually induced abortions are performed in an unsafe manner.^{7 8} Moreover, a recent study concluded that 70% of all Indian women who have an abortion do not use postabortion contraception.⁹ The unmet need for modern contraceptives is 22% in the cities and higher in rural areas. Female sterilisation is the most common contraceptive practice and accounts for 75% of all methods used.¹⁰ The use of reversible, modern methods in order to



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postpone the birth of a first child or for spacing births is infrequent.¹¹

Some of the barriers that impede women's access to contraception are healthcare providers who are inadequately trained, insufficient in number and poorly supervised.¹² Studies have shown that improving the quality of care increases and sustains contraceptive use by women.¹³ Providers need adequate knowledge of contraceptive methods and training in counselling skills in order to provide reliable information to women.¹⁴ Despite the availability of effective methods of contraception in India, many pregnancies remain unintended. Considering the future role of medical students as contraceptive counsellors, little is known about their views on contraceptive methods, use or counselling. This study aimed to investigate the knowledge, attitudes and perceptions towards contraceptive use and counselling among medical students in Maharashtra, India.

MATERIALS AND METHODS

In February 2011, a cross-sectional survey was conducted using a pretested, self-administered questionnaire among medical students in their fifth year (internship) of training in the Indian state of Maharashtra.¹⁵ Of a total of 43 medical colleges in Maharashtra (5195 students), 19 are public (2200 students). A convenience sample of 27 colleges (8 public and 19 private) was included in the study. The total number of students eligible at the study sites was 2006 and in total 1996 students responded to the questionnaire (1423 private and 573 public colleges). All medical students at the selected institutions were asked to participate before attending a lecture in comprehensive abortion care (CAC). The lecture was organised by a non-governmental organisation within the medical education programme.

Study setting

Located in west-central India, Maharashtra is the country's second most populous state and the third largest in area. Of its 112 million inhabitants, a slight majority live in rural areas. Maharashtra's socioeconomic status, literacy rate and health infrastructure are better than the national average.¹⁶ Medical education in India is regulated by the Medical Council of India and is either public or private. Medical education consists of 4.5 years of theoretical studies followed by 1 year of internship. According to the national medical education curriculum, the theoretical studies should cover CAC, as well as contraceptive methods and counselling.¹⁷

Instrument

The questionnaire contained three sections. Section 1 included sociodemographic characteristics such as gender, age, religion, marital status, place of birth/area of upbringing and type of college. Section 2 included questions related to perception of education and training in sexual and reproductive health, and respondents'

assessment of their knowledge regarding contraceptive methods and services. Section 3 consisted of 12 statements on different aspects of contraceptive methods, services and values surrounding sexual and reproductive health. Participants were asked to circle the most appropriate alternative on a five-point Likert scale (disagree completely/disagree/neither agree nor disagree/agree/agree completely).¹⁸

Statistical analysis

Questionnaires that contained one or more answers were included in the analysis. Statistical Package for Social Studies (SPSS) V.20.0 software was used. Descriptive statistics were applied to all sections of the questionnaire; actual numbers and proportions were calculated; and cross-tabulations with intergroup comparisons of answers were made for students of different genders, types of colleges and places of birth. The alternatives 'agree' and 'agree completely' were aggregated, as well as the alternatives 'disagree' and 'disagree completely'. Any difference with a 95% CI was regarded as significant.

Ethical considerations

The study was carried out in compliance with the principles of the World Medical Association Declaration of Helsinki. The medical students eligible for participation in the study were given oral information about the study and were informed that participation was anonymous and voluntary and that choosing not to participate would not affect their studies or future careers negatively. By filling in the questionnaire, written consent to participation was given. Permission to conduct the survey in connection with the training programme was obtained from the principal at each college.

RESULTS

A total of 1996 medical students participated in the study (response rate 99%; 1996/2006). The demographic characteristics of the students are outlined in [table 1](#). Since the students were homogeneous in terms of age, religion and marital status, the variables remaining for intergroup comparisons were gender (56.8% male and 43.1% female), place of birth (72.3% urban and 25.5% rural) and type of college (71.3% private and 28.7% public).

[Table 2](#) shows the students' perception of education and training in sexual and reproductive health, as well as the respondents' assessment of their knowledge regarding contraceptive methods and services. Most of the students thought that the topic of reproductive health, including contraceptive methods, had been adequately covered in their curriculum. A majority considered their theoretical knowledge in sexual and reproductive health to be fair or good. A large proportion reported having had no clinical practice in abortion care services during their training. A comparison between students from private and public colleges revealed no significant differences.

Table 1 Demographics of medical students in Maharashtra, India, 2011 (n=1996).

| Variable | n | Per cent |
|---------------------------|------|----------|
| Age | | |
| 20–24 | 1886 | 94.4 |
| 25 and above | 98 | 5 |
| Data missing | 12 | 0.6 |
| Gender | | |
| Female | 860 | 43.1 |
| Male | 1134 | 56.8 |
| Data missing | 2 | 0.1 |
| Place of birth/upbringing | | |
| Rural | 508 | 25.5 |
| Urban | 1444 | 72.3 |
| Data missing | 44 | 2.2 |
| Religion | | |
| Hindu | 1747 | 87.7 |
| Muslim | 97 | 4.9 |
| Christian | 17 | 0.9 |
| Other | 133 | 6.7 |
| Data missing | 2 | 0.1 |
| Marital status | | |
| Single | 1970 | 98.7 |
| Married | 22 | 1.1 |
| Data missing | 4 | 0.2 |
| Type of college | | |
| Private | 1402 | 71.3 |
| Public | 556 | 28.7 |

Data from 27 medical colleges (8 public, 19 private).

With regard to contraceptive counselling, 74% believed it should be given individually and not in a group. A majority of the respondents (67.2%) thought

doctors should be the ones to provide contraception to patients, while 27.1% considered health workers to be the most appropriate counsellors. A few students chose other alternatives (nurse 3%, other 1.6% and missing 1.1%). A majority (95.1%) indicated that they would like to have responsibility for providing information on contraception as future doctors. Regarding the use of oral contraceptives, 88.5% of the students stated that they should be taken every day. Some students (5.8%) thought they were to be taken after intercourse or once a month (3.4%). A cross-sectional analysis of answers given by students from rural versus urban places of birth revealed no significant differences with regard to these results. However, those from private colleges preferred individual contraceptive counselling over group counselling (private college students 78.2%, 95% CI 75.9% to 80.3%; public college students 70.6%, 95% CI 66.6% to 74.4%). Also, female students were more supportive of individual counselling than male students (females 80.2%, 95% CI 77.4% to 82.9%; males 72.8%, 95% CI 70.1% to 75.4%). Females also expressed a greater interest in having responsibility for providing contraceptive information as future doctors than males (females 98.2%, 95% CI 96.8% to 98.8%; males 95.3% CI 93.8% to 96.4%). Moreover, the female students were better informed on the daily intake of contraceptive pills than the male students (females 93.3%, 95% CI 91.5% to 94.9%; males 88.8%, 95% CI 86.8% to 90.6%).

The knowledge, attitudes and perceptions of medical students towards contraceptive methods, services and values surrounding sexual and reproductive health are shown in table 3. A cross-sectional analysis comparing students from public and private colleges indicated a

Table 2 Perceptions of education and training in sexual and reproductive health among medical students (n=1996) from private (n=1402) and public colleges (n=556) in Maharashtra, India, 2011

| Variable | All n (%) | Private n (%) | Public n (%) |
|---|-------------|---------------|--------------|
| Was sexual and reproductive health included in your curriculum? | | | |
| Not at all | 27 (1.4) | 17 (1.2) | 10 (1.8) |
| Somewhat | 468 (23.4) | 352 (25.0) | 116 (20.6) |
| Sufficiently | 1475 (73.9) | 1039 (73.8) | 436 (77.6) |
| Data missing | 26 (1.3) | | |
| Have contraceptive methods been taught in your programme? | | | |
| Not at all | 16 (0.8) | 4 (0.3) | 12 (2.1) |
| Somewhat | 199 (10.0) | 143 (10.1) | 56 (10.0) |
| Sufficiently | 1759 (88.1) | 1265 (89.6) | 494 (87.9) |
| Data missing | 22 (1.1) | | |
| How do you assess your theoretical knowledge of sexual and reproductive health? | | | |
| Poor | 30 (1.5) | 24 (1.7) | 6 (1.1) |
| Fair | 552 (27.7) | 381 (27.0) | 171 (30.9) |
| Good | 1122 (56.2) | 815 (57.8) | 307 (55.4) |
| Very good | 260 (13.0) | 190 (13.5) | 70 (12.6) |
| Data missing | 32 (1.6) | | |
| Have you had clinical practice in abortion care services during your training? | | | |
| Yes | 268 (13.4) | 196 (14.1) | 72 (13.0) |
| No | 1678 (84.1) | 1196 (85.9) | 482 (87.0) |
| Data missing | 50 (2.5) | | |

Table 3 Knowledge, attitudes and perceptions on contraception among medical students (n=1996) in Maharashtra, India, 2011

| Statement | | Disagree completely | Disagree | Neither | Agree | Agree completely | Missing | Statement |
|--|---|---------------------|----------|---------|-------|------------------|---------|-----------|
| Contraceptive pills might cause cancer | n | 118 | 267 | 170 | 1126 | 304 | 11 | |
| | % | 5.9 | 13.4 | 8.5 | 56.1 | 15.2 | 0.6 | |
| Contraceptive pills can cause infertility | n | 526 | 857 | 227 | 349 | 25 | 12 | |
| | % | 26.4 | 42.9 | 11.4 | 17.5 | 1.3 | 0.6 | |
| Contraceptive pills are inconvenient to use | n | 608 | 855 | 236 | 249 | 38 | 10 | |
| | % | 30.5 | 42.8 | 11.8 | 12.5 | 1.9 | 0.5 | |
| Emergency contraceptive pills can be used several times a month | n | 972 | 630 | 115 | 227 | 37 | 15 | |
| | % | 48.7 | 31.6 | 5.8 | 11.4 | 1.9 | 0.8 | |
| Condoms protect against sexually transmitted diseases/HIV | n | 30 | 19 | 22 | 556 | 1361 | 8 | |
| | % | 1.5 | 1 | 1.1 | 27.9 | 68.2 | 0.4 | |
| Traditional contraceptive methods (safe periods, withdrawal) are the best | n | 647 | 913 | 166 | 190 | 69 | 11 | |
| | % | 32.4 | 45.7 | 8.3 | 9.5 | 3.5 | 0.6 | |
| Contraceptive information should only be for married couples | n | 1305 | 566 | 57 | 41 | 20 | 7 | |
| | % | 65.4 | 28.4 | 2.9 | 2.1 | 1 | 0.4 | |
| Doctors working in abortion services have friendly attitudes towards unmarried women | n | 166 | 346 | 559 | 695 | 215 | 15 | |
| | % | 8.3 | 17.3 | 28 | 34.8 | 10.8 | 0.8 | |
| Married couples are shy to talk about contraception with each other | n | 150 | 629 | 423 | 720 | 64 | 10 | |
| | % | 7.5 | 31.5 | 21.2 | 36.1 | 3.2 | 0.5 | |
| Women feel confident discussing contraception with doctors | n | 86 | 654 | 445 | 696 | 105 | 10 | |
| | % | 4.3 | 32.8 | 22.3 | 34.9 | 5.3 | 0.5 | |
| Traditional values are barriers for sex education in India | n | 72 | 137 | 116 | 939 | 722 | 10 | |
| | % | 3.6 | 6.9 | 5.8 | 47 | 36.2 | 0.5 | |
| Sex education encourages unmarried people to have sex | n | 536 | 824 | 329 | 232 | 68 | 7 | |
| | % | 26.9 | 41.3 | 16.5 | 11.6 | 3.4 | 0.4 | |

difference of opinion regarding the statement “Doctors working in abortion service have friendly attitudes towards unmarried women.” Fewer students from private colleges agreed or agreed completely compared with students from public colleges (private college students 43.8%, 95% CI 41.8% to 46.4%; public college students 51.2%, 95% CI 47.0% to 51.4%).

Table 4 summarises the significant differences in perceptions found among students based on their place of birth (urban or rural): to a greater extent, students with an urban place of birth agreed with the statement “Contraceptive pills might cause cancer” (urban 74.1%, 95% CI 71.8% to 76.4%; rural 66.4%, 95% CI 62.2% to 70.5%); a larger proportion of students from a rural background agreed with the statement “Doctors working in abortion service have friendly attitudes towards unmarried

women” (rural 55.9%, CI 95% 51.6% to 60.2%; urban 42.4%, 95% CI 39.8% to 45.0%); and it was more common for students with a rural place of birth to agree with the statement “Sex education encourages unmarried people to have sex” (rural 20.2%, CI 95%, 16.9% to 24.0%; urban 13.2%, 95% CI 11.5% to 15.1%).

Table 5 compares male and female medical students’ knowledge, attitudes and perceptions towards contraception. More female students agreed or agreed completely that contraceptive pills might cause cancer. Male students tended to believe that emergency contraceptive pills may be used several times a month. Male and female students largely agreed or agreed completely that condoms protect against sexually transmitted diseases (STD) and HIV, although female students were significantly more supportive of their use. One in 5 male

Table 4 Place of birth in relation to knowledge, attitudes and perceptions on contraception

| Statement | Place of birth | Agree or agree completely n* (%) | 95% CI |
|--|----------------|----------------------------------|--------------|
| Contraceptive pills might cause cancer | Rural | 344 (66.4) | 62.2 to 70.5 |
| | Urban | 1081 (74.1) | 71.8 to 76.4 |
| Doctors working in abortion services have friendly attitudes towards unmarried women | Rural | 289 (55.9) | 51.5 to 60.2 |
| | Urban | 617 (42.4) | 39.8 to 45.0 |
| Sex education encourages unmarried people to have sex | Rural | 105 (20.2) | 16.9 to 24.0 |
| | Urban | 193 (13.2) | 11.5 to 15.1 |

Summary of significant differences among medical students (n=1996) in Maharashtra, India, 2011.

*Number of students does not always total 1996 due to missing answers.

Table 5 Comparison of male and female medical interns' knowledge, attitudes and perceptions towards contraception (n=1996) in Maharashtra, India, 2011

| Statement | Sex female (F) male (M) | Agree or agree completely n* (%) | 95% CI |
|--|----------------------------|-------------------------------------|--------------|
| <i>Contraceptive pills might cause cancer†</i> | F | 652 (77.1) | 74.1 to 79.9 |
| | M | 753 (68.0) | 65.2 to 70.8 |
| Contraceptive pills can cause infertility | F | 150 (17.7) | 15.2 to 20.4 |
| | M | 216 (19.5) | 17.2 to 22.0 |
| Contraceptive pills are inconvenient to use | F | 132 (15.6) | 13.2 to 18.2 |
| | M | 149 (13.4) | 11.5 to 15.6 |
| <i>Emergency contraceptive pills can be used several times a month†</i> | F | 76 (9.0) | 7.2 to 11.1 |
| | M | 182 (16.5) | 14.3 to 18.8 |
| <i>Condoms protect against sexually transmitted diseases/HIV†</i> | F | 830 (97.9) | 96.7 to 98.7 |
| | M | 1056 (95.3) | 93.9 to 96.5 |
| Traditional contraceptive methods (safe periods, withdrawal) are the best | F | 90 (10.7) | 8.7 to 12.9 |
| | M | 163 (14.7) | 12.7 to 16.9 |
| Contraceptive information should only be for married couples | F | 22 (2.6) | 1.6 to 3.9 |
| | M | 37 (3.3) | 2.4 to 4.6 |
| <i>Doctors working in abortion services have friendly attitudes towards unmarried women†</i> | F | 326 (38.5) | 35.2 to 41.9 |
| | M | 569 (51.4) | 48.4 to 54.4 |
| Married couples are shy to talk about contraception with each other | F | 311 (36.7) | 33.5 to 40.1 |
| | M | 462 (41.7) | 38.8 to 44.7 |
| Women feel confident discussing contraception with doctors | F | 350 (41.3) | 37.9 to 44.7 |
| | M | 438 (39.5) | 36.6 to 42.5 |
| Traditional values are barriers for sex education in India | F | 718 (84.8) | 82.2 to 87.1 |
| | M | 920 (83.0) | 80.6 to 85.1 |
| <i>Sex education encourages unmarried people to have sex†</i> | F | 88 (10.4) | 8.4 to 12.6 |
| | M | 209 (18.8) | 16.6 to 21.3 |

*The number of students does not always total 1996 due to missing answers.

†Italics indicates significant differences.

students versus 1 in 10 female students agreed or agreed completely that sex education encourages unmarried people to have sex. Among male students, 51.4% agreed or agreed completely that doctors working in abortion services have friendly attitudes towards unmarried women, compared with 38.5% among female students.

DISCUSSION

The major finding in this study is the inadequate level of training in CAC and contraceptive counselling of medical students who had already passed the theoretical part of the medical education. Our findings further suggest that even though the medical students surveyed had experienced little training in abortion care services, they expressed a clear interest in disseminating contraceptive information as future physicians. Although they had mostly positive attitudes towards contraception and premarital counselling, misconceptions about modern contraceptive methods and the impact of sex education were common.

Few respondents in our study had had any clinical experience in abortion care services; yet a majority thought the topics of sexual and reproductive health and contraceptive methods had been adequately covered in their coursework. Still, nearly 1 in 5 interns falsely believed that contraceptive pills can cause infertility and 1 in 10 did not know that contraceptive pills are

to be taken on a daily basis. More females than males were unaware that emergency contraceptive pills may be used several times a month. A majority of males and females perceived that contraceptive pills might cause cancer, although females were more likely to agree on this. Recent studies indicate that family planning training during residency improves future physicians' proficiency in contraceptive counselling.¹⁹

Our findings did not reveal any differences in self-rated or theoretical knowledge between public and private college students. The background factor that had the greatest influence on knowledge was gender. Female students were better informed about the utilisation of oral contraceptives and the protection that condoms offer against STD/HIV. They also reported that sex education does not encourage unmarried people to have sex. Regardless of demographic background, most of the students in our study recognised that traditional values are barriers to sex education. Few students thought that contraceptive information should only be provided to married couples, although students born in rural areas had more negative perceptions of sex education. The sociocultural norms of Indian society contribute to making sex-related issues taboo and hinder young people from seeking counselling regarding sexual health.²⁰ Research reveals that healthcare providers often impose unnecessary barriers in dispensing contraceptives,

including denial of a contraceptive method on the basis of age, parity, marital status or lack of parental or spousal authorisation.^{21–22} One in four respondents in our study did not believe that doctors working in abortion services held positive attitudes towards unmarried women.

Although nearly all students in our survey said that they would like to assume the responsibility for contraceptive counselling in their future careers, the current shortage of providers (especially in rural areas) may require the shifting of tasks. Task sharing or shifting within family planning services is recommended by the WHO.²³ The involvement of clinical officers, midwives and nurses increases access to modern contraception in low resource settings.²⁴ The fact that one-fourth of our respondents believed that health workers, rather than physicians, were best suited to dispense contraceptive information suggests that future physicians would be willing to relegate such tasks to others.

Several studies conclude that even though abortion providers discuss contraception with their patients, it is common for patients to refuse any form of contraception following an abortion.^{25–26} The quality of provider counselling and patient education is important for the successful integration of new hormonal methods of contraception into clinical practice.²⁷ Medical students need training in comprehensive sexual and reproductive health services that conforms with international human rights standards and includes respect for privacy and confidentiality, in order to provide full and accurate information to their future patients.

METHODOLOGICAL CONSIDERATIONS

One weakness is the non-probability sampling technique applied in our study, which might reduce the external validity. The large sample size and the fact that a fairly high proportion of the total number of students from private (47.5%) and public (26.0%) colleges from the state of Maharashtra are included strengthen the validity. However, since India is a country with large regional differences in socioeconomic and health status, our results may not be representative of all medical students in the country. On the other hand, the presence of students from public and private medical schools in urban and semiurban settings may strengthen the generalisability for Maharashtra. The method of using anonymous questionnaires is suitable for sensitive topics such as sexual and reproductive health. The fact that the questionnaire was distributed before a lecture covering the subject under investigation might influence the result. However, the students' knowledge, perceptions and attitudes reflect the content of their basic education programme. The reliability and validity of the survey are strengthened through previous testing of the instrument.

CONCLUSIONS

We have found positive and negative attitudes towards modern contraceptive methods, sex education and family

planning counselling among medical students in India. There has been a willingness to offer sexual and reproductive health services to people regardless of their marital status. Still, medical students in Maharashtra have misconceptions about modern methods of contraception. Training in contraceptive counselling should be implemented in basic medical education in India in order to increase women's access to evidence-based maternal healthcare services.

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Contributors BE had the original idea of the study and developed the study protocol together with HO, KGD and MKA, who developed the original questionnaire. HO entered the data and made the first analysis together with SH who drafted the manuscript. All authors have contributed to the writing and revision of the final version of the manuscript and approved the submitted version.

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Competing interests None.

Ethics approval Oral permission was obtained from the principal of each college and also the head of the institutional board. The study has been approved by the research ethical committee at Karolinska Institutet (Dnr: 2013/415-31/4).

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