An assessment of clients' knowledge of Family Planning in Matlab

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Foreword

Empirical evidence point to a causal relationship between the socio-economic status of individuals and communities and their health. Indeed improvement in health is expected to follow socio-economic development. Yet this hypothesis has rarely been tested: at least it has not undergone the scrutiny of scientific inquiry. Even less understood are the processes and mechanisms by which the changes are brought about.

The Rural Development Program (RDP) of BRAC is a multisectoral integrated program for poverty alleviation directed at women and the landless poor. It consists of mobilization of the poor, provision of non-formal education, skill training and income generation opportunities and credit facilities. The program is the result of 20 years of experience through trial and error. However evaluation of its impact on human well-being including health has not been convincingly undertaken.

The Matlab field station of ICDDR,B is an area with a population of 200,000, half of whom are recipients of an intensive maternal and child health and family planning services. The entire population is part of the Center's demographic surveillance system where health and occasionally socio-economic indicators have been collected prospectively since 1966.

A unique opportunity arose when BRAC decided to extent its field operations (RDP) to Matlab. ICDDR,B and BRAC joined hands to seize this golden occasion. A joint research project was designed to study the impact of BRAC's socio-economic interventions on the well-being of the rural poor, especially of women and children, and to study the mechanism through which this impact is mediated.

In order to share the progress of the project and its early results, a working paper series has been initiated. This paper is an important addition in this endeavour. The project staff will appreciate critical comments from the readers.

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Executive summary

The study aimed to assess the level of effective knowledge of women on different family planning methods to see the impact of quality of care. The study was carried out in two villages chosen from ICDDR,B intervention and comparison areas of Matlab thana where BRAC's Rural Development Programme (RDP) has also been working since 1992. From both the areas 600 women of reproductive age were randomly selected and interviewed.

The findings reveal that in the MCH-FP area 56% of women practiced family planning while only 33% did so in the comparison area. In both the areas the main methods used were pills and injectables.

Regarding the knowledge of contraceptives, most women in the MCH-FP area were able to name five modern methods while the majority in the comparison area could name only three methods. Virtually all women in both the villages could describe the nature of the pill and ligation while many had no idea about IUD and condom. Correct categorization of methods as temporary or permanent was found to be higher in the MCH-FP area than in the comparison area. The study found that women in both the areas had little or no knowledge of the specific indications of all methods.

The majority of women in the MCH-FP area knew about proper use of pill, injection and condom compared to those in the comparison area where none had complete knowledge regarding any method. However, even in the MCH-FP area women did not know what to do if two pills were missed. The nature and the function of the brown tablets were not known to the women in the comparison area but some women in the MCH-FP area had some idea of the former.

In the MCH-FP area 78.4 % of the women knew the specific date of menstrual period from which injection should be started compared to the comparison area where only some of them knew about that. The majority of respondents in both the areas knew that it should be taken regularly at an interval of three months on a fixed date, which was significantly higher in the MCH-FP area. The study found that majority of women in the MCH-FP area knew the exact time and frequency of using condom compared to the comparison area where only a few knew that. This is not surprising given that only a small proportion of women in the comparison area ever heard of condoms and that none of the couples were using it. Women had no knowledge about the timing of insertion of IUD, but only that it had to be replaced periodically at an interval of 2-4 years.

Women's general perception about the mechanism of action of the different methods was that they act by damaging the sperm or ovum. Women had no clear idea about the advantages of any of the methods. It was found that most of the women in the MCH-FP area were interested in injection, as the main advantage was that one injection provided three months' protection and maintained privacy (as it was administered like any other injection). This was specially appreciated by those who were shy about using contraceptives.

Women had little knowledge of the side-effects of contraceptive methods. The commonly mentioned side-effects of pill and injection were: giddiness, weakness, headache, and irregular and heavy menstrual bleeding. Some respondents mentioned that injection caused prolonged amenorrhoea which in turn caused bodyache, and burning sensation in hands and feet. The women in the MCH-FP area had misconceptions about condoms such as that it might cause genital ulcer. The side-effects of ligation were more often assumed than actually experienced. The respondents

believed that ligation was dangerous for health and caused heavy and irregular menstruation, severe weakness, which makes women unable to do heavy work and even causes death.

Women's confidence in the management of the side-effects, as well as the knowledge of the safety of a method is directly related to user's health and its use. But this study shows that women had no adequate knowledge of side effect management. Majority of the women in both the areas said that the side-effects had to be compensated by eating more nutritious food. The perceived effectiveness in preventing pregnancy is a prime consideration in method choice. The findings revealed that most women in both the areas had a satisfactory level of knowledge about the effectiveness of different methods.

The study showed that in the MCH-FP area, fieldworkers and in the comparison area government fieldworkers, relatives and neighbours were the major sources of information. From our findings it is understood that service providers put emphasis mainly on pill and injection. They did not provide information, education and motivation (IEM) about female clinical methods such as IUD and ligation or of male methods.

This study provided deeper insights into the impact of quality of care. The study conclusion is that, both contraceptive users and non-users do not possess adequate knowledge of family planning methods. Women are doubtful and confused about the contraceptives in general. The ICDDR,B MCH-FP Programme and BRAC's rural development programme in the area have paved the way to improving quality of services through appropriate IEM. This will help make people more aware about family planning, MCH facilities and their benefits on individuals, families and communities. However, the study suggests the following for further improvements in the family planning programme.

1. The programme should think about the ways of widening individuals' knowledge of availability, source, cost, suitability, etc. of all methods including male methods.

2. The non-users should be made aware of family planning. This may be done by arranging an informal discussion with them on a weekly basis in the community in small groups. Collaboration with the government of Bangladesh and other NGOs may be taken into consideration.

3. Programme should provide detailed and equal accounts about indication, proper use, inherent characteristics, benefits, consequences and possible complications of different methods for the success of family planning programme, as well as for clients' own satisfaction and confidence.

4. Women should be provided with detailed information about the common side-effects, psychological problems, and 'warning signs', how to deal with them at home and when to inform the providers. They should be given proper counseling before and after adopting contraception. The information about the mechanism of action of these methods and basic knowledge on the physiology of the reproductive system may play an important role. It will be helpful to eliminate anxiety about their health, traditional beliefs, misconceptions and fears.

INTRODUCTION

Bangladesh has achieved success in family planning as measured by the contraceptive prevalence rate (CPR) which is at present 45%. The total fertility rate (TFR) has also come down to 4.2 per woman partly as a response to governments' family planning efforts. The government policy aims at further reducing the country's TFR to 2.76 by the year 2005, by raising the CPR to 70% by strengthening government family planning programme and encouraging women to bear children between 18-35 years (GOB, 1995).

The family planning programme in Bangladesh, therefore, put much emphasis on contraceptive prevalence and acceptance, but inadequate attention to the quality of care increases the dropout of contraceptive users. High quality equipment, modern buildings or costly service is probably not essential provided that service providers genuinely address the concerns of their clients. Clients should be given an essential understanding of the various contraceptive choices to allow informed decisions, and to seek advice when necessary.

Recent policies have emphasized that the programme should pay more attention towards quality of care, instead of focusing solely on increasing the number of family planning acceptors. Family planning efforts in Bangladesh has managed to promote the knowledge of contraceptives but it is important to understand how 'effective' this knowledge is. For example, whether people are aware of the different methods available, who these methods are intended for, how to use these methods properly, how different methods work, what the problems and benefits of different methods are, and when and where to seek help.

The objectives of the present study are:

1. to assess knowledge regarding the range of methods available;
2. to measure the level of knowledge regarding the nature, category, indication, mode of administration, proper use, mechanism of action, advantages, side-effects and their management, and perceived effectiveness of different family planning methods (definition of these terms are given in Appendix 1); and
3. to determine the knowledge about source of information and supply of the methods of contraception.

Conceptual framework

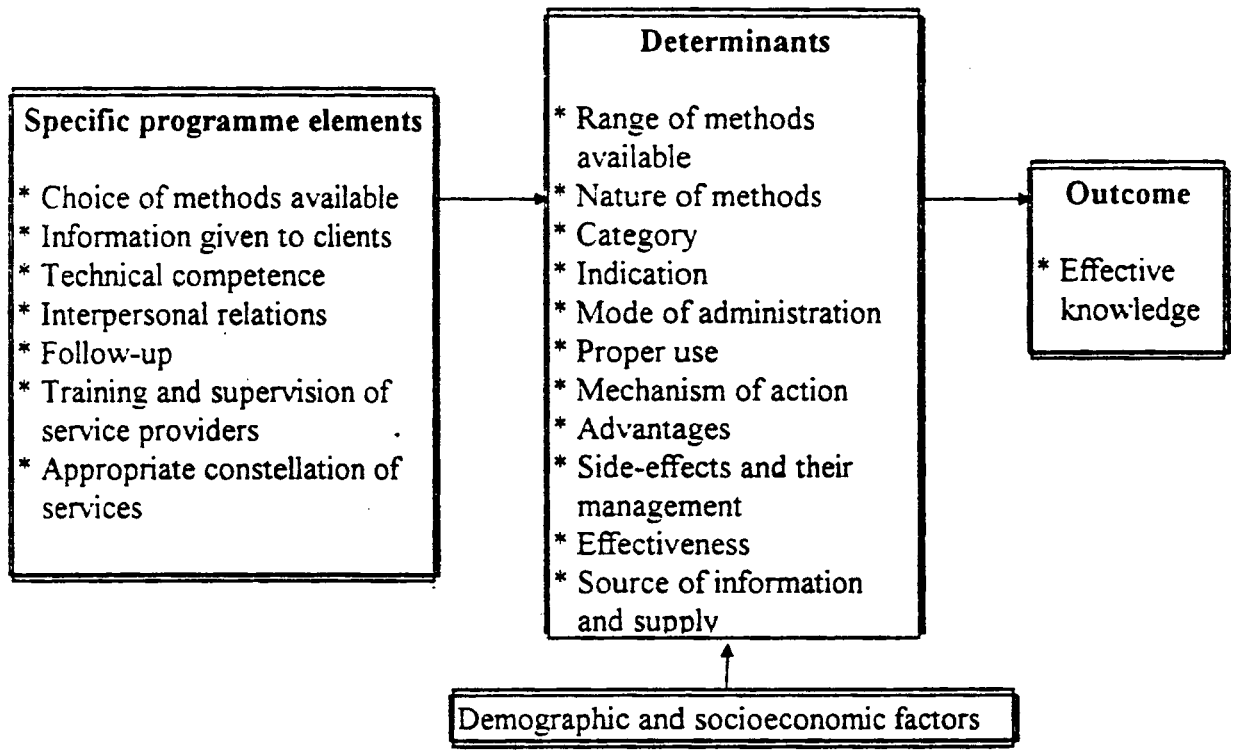
Bruce (1990) and Jain (1989) defined quality of care in terms of the way individuals are treated by the system providing services. Using this principle an analytical framework has been developed by Judith Bruce (1990) with the assumption that individuals' knowledge, satisfaction and behaviour can be influenced by programme efforts and its specific elements. Her framework hypothesizes the relationship between programme efforts under different aspects of the program (policy/political support, resources allocated, programme management structure) and their impact on clients. To measure a programme's impact on clients' 'effective' contraceptive knowledge, Bruce (1990) emphasizes the following specific elements: (1) the range of methods available, their contraindications, advantages and disadvantages; (2) the use of method selected, its possible impact on sexual practice, and its potential side-effects and how to manage those side-effects. This framework allows us to measure the outcome or the consequences of a given programme at individual level emphasizing the clients perspective by applying different elements of the framework separately or simultaneously.

According to Bruce, one can see the impact of 'quality of care' in three dimensions. Its short-term outcome which includes clients' knowledgeable use of the method, knowledge of alternatives (including sources) and clients' willingness to return to the provider or to refer others. Longer-term client-based indicators include clients' use effectiveness (at 12 months) with self employed methods, or clients' ability over time (for example 24 months) to manage their own fertility through continuous use of one method or through switching to other method. The third dimension is the longer-term indicators, the clients' ability to attain their own stated wishes regarding regulation of their fertility — the wanted and unwanted status of pregnancies in the period after first service contact (Bruce 1990). This paper is concerned with the short-term though the importance of the other dimensions must be recognized.

Informed choice can be assessed by measuring the clients' knowledge about the details of all methods available. Following Bruce's framework we included in our analytical framework all the specific elements of the programme and the method specific determinants through which the specific programme elements work to enhance clients' knowledge (Fig. 1). In this study we discussed only the method specific determinants to assess the effective family planning

knowledge of the client, not that of the service providers or the effectiveness of the programme itself. In addition, we also included demographic and socioeconomic factors to differentiate the influence of programmatic and non-programmatic factors on clients' knowledge.

Figure 1: An analytical framework for assessing effective knowledge of contraceptive



METHODOLOGY

The study was conducted in Matlab, where the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has been operating a demographic surveillance system (DSS) since 1966. As in most of rural Bangladesh, the majority of the Matlab population is poor. The dominant occupation of men is farming and almost all women are housewives. Farmers, in general, are in a marginal economic situation owning less than 2 acres of land while 30% of households are landless. About 45% of males and 73% of females have received no formal education (ICDDR,B, 1982; Fauveau, 1994).

ICDDR,B divided the Matlab DSS field area into two -- an intervention or MCH-FP area (70 villages) and a comparison area (79 villages). In the intervention area, in addition to the

regular government family planning programme, intensive maternal and child health care and family planning services have been provided by ICDDR,B since the late seventies. Health care services at the household level are delivered by 80 female community health workers (CHWs). They reside in the villages and make regular fortnightly household visit. They provide counseling on family planning and distribute a variety of contraceptives, carry out immunization and vitamin A supplementation, and supply safe delivery kits. The provision of a range of curative and preventive maternal and child health services along with a choice of contraceptive methods has undoubtedly made an important contribution towards enhancing the perceived quality and nature of the Matlab service programme to current and potential users (Koblinsky et al., 1984; Phillips et al., 1988).

ICDDR,B provides only oral rehydration saline (ORS) free of cost in the comparison area but maintains a regular DSS. However, the comparison areas receive regular government health and family planning services.

TFR started to decline in the MCH-FP area after the inception of the ICDDR,B intervention programme and continued to decline throughout the following years, dropping to 2.9 in 1992. In the comparison area TFR declined as well dropping to 4.0 in 1992 but has remained about 30% higher on average than in the programme area (DSS, 1995). The CPR has risen from 4.7% in 1975 to 57.1% in 1995 in the programme area, a rate much higher than the national average. In the comparison area CPR increased from 4.7% in 1975 to 29.9% in 1995 (Fauveau, 1994; ICDDR,B, 1995).

BRAC extended its Rural Development Programme (RDP) at Matlab in 1992. The RDP is targeted to the poorest of the poor especially women. The main objectives of the RDP are to empower the rural poor and to alleviate poverty through a variety of programmes, namely institution building (village-based social organizations), functional education, skill and human development training, credit for income generating activities, legal education for females and non-formal primary education for children (BRAC & ICDDR, B, 1994: 5-6).

For this study we randomly selected one village from each area covered by the BRAC programme: Narayanpur village from intervention area and Sardarkandi village from comparison area. We then randomly selected 250 households from Narayanpur village and 350 households

from Sardarkandi village. From each household one married woman of reproductive age[1] was chosen giving in total 600 women who were interviewed. If the chosen woman of a household was absent, a woman from the next household was selected and if that woman was also absent then a woman from the preceding household was interviewed. The questionnaire was thoroughly pre-tested, and then modified and edited on the basis of the feedback received from pre-testing before finalization.

Data collection was carried out from October to November 1995. In-depth interviews were conducted employing a structured questionnaire covering the socio-demographic background of the respondents, their knowledge of family planning methods such as the range of methods available, nature, category, indication, proper use, advantage, side-effects and their management, mode of action, mode of administration, effectiveness, and source of information and supply.

Characteristics of respondents

Characteristics of respondents from two selected villages are shown in Table 1. In our sample most respondents were in the age group 20-39. About a quarter of the respondents in the programme area sample was over 40 years of age while a sizeable proportion of women in the comparison area was under the age of 20. Most respondents were illiterate, however, women in the MCH-FP area were comparatively more educated than the women in the comparison area. Of those who have attended school, in the MCH-FP area nearly 50% have attended either primary or secondary school, whereas in the comparison area the majority had attended only primary school.

Few women in the intervention area were from BRAC eligible households whereas in the comparison area almost a three quarters of the respondents were from BRAC eligible households. The criteria for BRAC eligibility is that the household owns no more than half an acre of land including homestead land and at least one member of the household sells at least 100 days of manual labour in a year to earn a livelihood (BRAC & ICDDR, B, 1994: 5). This indicates that women in the comparison area are more poor than those in the MCH-FP area.

[1] Reproductive age (15-49) start with the first menstrual period or menarche and terminates with menopause. In Bangladesh the mean age of menarche is 15.8 year (Chowdhury et al., 1977 and Foster et al., 1986) and the mean age at menopause is 43.6 year (Karim et al., 1985).

Table 1. Respondents' demographic and socioeconomic characteristics by study area.

Characteristics	MCH-FP area % (n=250)	Comparison area % (n=350)
Age group		
< 20	5.2	11.1
20-29	32.0	34.3
30-39	35.6	38.6
40+	27.2	16.0
Education		
Illiterate	45.2	66.0
Literate but did not attend school	5.2	6.0
Primary	28.4	21.1
Secondary	20.0	6.3
Higher secondary	0.8	0.6
Graduate	0.4	-
Occupation		
Farming	-	0.3
Wage labourer	-	0.6
Regular job	1.2	0.6
Business	-	0.3
Household work	98.8	98.0
Self-employed	-	0.3
No. of living children		
None	4.8	9.1
1-2	32.8	29.1
3-4	39.6	32.3
5-6	18.4	20.6
6+	4.4	8.9
BRAC eligible household		
Yes	45.6	74.0
No	54.4	26.0

MAJOR FINDINGS

The determinants of effective knowledge of contraceptive

In this section we discuss women's knowledge of contraceptives under specific criteria outlined in the analytical framework. A brief description of contraceptive methods covering this criteria is given in Appendix 1.

Knowledge of the range of methods available

Respondents' basic knowledge of contraceptive methods was measured by their ability to name any method other than the ones they have used. This was strictly a measure of recognition rather than a measure of the knowledge about the actual methods used. In the MCH-FP area a majority of the women were able to tell the names of at least five modern methods while in the comparison area the majority could mention only three methods (Table 2).

However the high knowledge of the methods were not translated into actual practice of such methods as is shown in Table 2. Overall 55.6% in MCH-FP area and 33% in the comparison area used family planning at the time of survey. Women of the programme area gave an overall preference for injectable contraceptives, followed by oral pill, IUD, and surgical sterilization. In the MCH-FP area 65% of women said that they did not use IUD because they were worried about their health. In the comparison area 67% of women said that their husbands objected to their using IUD or that their shyness or the burning sensation felt during coitus prevented them using it. Some respondents in both areas said that nobody ever mentioned to them this possibility. The major reasons given by women in both the areas for not adopting ligation were husband's objection, fear of operation, and desire for additional children.

Table 2. Respondents' knowledge and use of contraceptives

Method	Knowledge		Use	
	MCH-FP	Comparison area	MCH-FP	Comparison area
Pill	85.6	84.0	14.4	14.0
Injection	65.6	83.1	34.4	10.9
IUD	96.8	44.0	0.8	-
Ligation	92.0	67.1	4.4	8.3
Condom	92.8	14.1	2.0	-
Vasectomy	2.0	0.3		
Rhythm	1.2	-		
Withdrawal	0.4	-		
Herbal	0.4	-		
Don't know	-	0.3		

Nature of methods

Respondents were asked to explain each method. Virtually all respondents in the MCH-FP and the comparison areas knew that pill is a tablet for contraception, taken orally and injectables are injections for contraception. In both the areas most women knew that a condom was a cap made of rubber or a *patka* (balloon). About 19% of the respondents in the comparison area could not explain the nature of condom. The proportion of respondents who said that the IUD was a coil made of plastic was significantly higher in the MCH-FP area (74%) than in the comparison area (47%). In the comparison area 48% of the respondents had no idea of the nature of the IUD. Almost all respondents in both the areas said that ligation was a method of contraception accomplished by an operation.

Category

Here we wanted to find out whether the respondent knew if these were temporary or permanent methods. The overwhelming majority in both the areas knew that pill, injection, condom and IUD are temporary methods and they all knew that ligation was a permanent method.

Indication

The respondents were asked if they were aware of the general users whom these methods are intended for. As shown in Appendix Table 1 nearly all respondents from both the areas knew that pill was a method used by women. Regarding its specific indication women had no clear idea or had some incorrect ones. In the MCH-FP area most women said that the pill was for newly married women while the vast majority in the comparison area said it was for women under 35 years of age. The other responses were mainly related to the number of children women had as an indication of suitability for the method. Almost everyone knew injectables was a method for women but believed that this was a method indicated for younger women under 35 years of age, or having at least one child.

About 80% of the respondents in MCH-FP area and 60% in comparison area knew that condoms were for men but 21% of women in the comparison area did not know whether condoms were for men or women. Quite a large number of women stated that condoms were used by women.

IUD was identified by most as a method for women, but this knowledge was significantly higher in MCH-FP area. About its specific indication, women especially in the comparison area, held different views, but most said it was for women with 1 or 2 children. Most respondents especially in the MCH-FP area knew that ligation was a female method. Women had a varying view on the specific indications of ligation; most rightly said that it was for women with three or more children while others gave answers such as for women over 30 or 40 years of age, or for those with two children.

Course of action (pill only)

A majority said that if someone missed a pill she must take two pills at a time on the next day, and this knowledge was significantly higher in the MCH-FP area whereas in comparison area vast majority did not know what to do. No respondent in either areas had any correct idea of what to do if two pills were missed on consecutive days. Several responses such as, nothing to do and take the pill as usual, or should take three pills at a time on the following day, or discontinue pill and use another method for remaining period until menstruation was mentioned (Table 3).

Table 3. Distribution of respondents according to their knowledge on course of action to be taken when pills are missed.

Situation and course of action	MCH-FP area (n=250)	Comparison area (n=350)
Missed one pill		
Do nothing, continue pill as usual	9.2	11.4
Take two pills the next day	90.4**	70.3
Take the missed pill the following morning	-	0.6
Don't know	0.4	17.7**
Missed two pills		
Do nothing, continue pill as usual	45.2**	31.7
Take two pills the next day	49.6**	12.3
Omit pill and use another method	4.0	44.0**

** significant at p< 0 .01

Mode of administration

We also asked women if they knew the process of intake or application of a contraceptive method. Virtually all the respondents in both areas said that injection was administered by others, such as doctor, nurse or fieldworker. Allmost all the women (98%) in the MCH-FP area said that an IUD is inserted in uterus by a doctor or a nurse while only 79% of women in the comparison area knew this. However, only a few in both the areas had an understanding as to when an IUD should be inserted. Most of the women in MCH-FP area could say that an IUD, once inserted, could left in place for 2 to 4 years but 43% of the women in comparison area did not know how long it gave protection. About the timing of insertion, women of both the areas had no knowledge.

Proper use

A little over three quarters of respondents of MCH-FP area and slightly less than half of the respondents in comparison area said that injectables could be given during any day of the first 5 days of menstrual period. Another one-third of the women in comparison area had no knowledge of when to begin using it. Most respondents in both the areas knew that it should be taken regularly at an interval of three months on a fixed date though this knowledge was higher in the MCH-FP area than in the comparison area.

All respondents in the MCH-FP area correctly said that condoms should be used during coitus and a vast majority of them also said that it should be used at every coitus. In contrast only 56% of the respondents in comparison area said that condoms should be used during coitus of which less than half said that it must be worn during every coitus.

Mechanism of action

We also measured the respondent's knowledge by asking them to explain how a contraceptive method worked inside the body to prevent a pregnancy. This question was not asked regarding condom and IUD. Knowledge of mechanism of action is a very complex process and probably not strictly required for women to know, or someways an unfair measurement of their knowledge. Most of the respondents' understanding was that pills and injections acted to prevent pregnancy by damaging the sperm and ovum.

Advantages

Women had no clear ideas of the advantage of pills, but most of the women in both the areas noted sensibly that it was easy to use and easily available. Over half of the respondents in both the areas said that injection had to be taken only every three months while others pointed out that there was no extra trouble of daily use as with oral pill. Both these responses refer to its convenience. Surprisingly very few stated that the injection maintained privacy.

In MCH-FP area 96% of the respondents said that condoms had no side effects, prevented transmission of STDs, or were easily available. In contrast, only 62% of the comparison area respondents knew of its advantages.

The main advantage of IUD, according to MCH-FP respondents, was that there was no trouble of daily use. A number of respondents from the comparison area said that by using IUD they were free from doubt for 2-5 years. However, 54% of the women in this area could not tell any advantages of using IUD. All the respondents in the MCH-FP area and 94% in comparison area said that the advantage of ligation was that it prevents pregnancy forever.

Side-effects and their management

Menstrual irregularities, headaches, obesity and physical weakness were among the common side-effects from using pill, injectables, IUD and ligation. Appendix Table 2 provides more detailed information. In both the areas most women said that pills caused giddiness. Women in the MCH-FP area also mentioned nausea and hypertension, and had significantly higher knowledge about side-effects. Women also reported that IUD caused uterine infection, lower abdominal pain and that it may be expelled or migrate into the abdomen. Lower abdominal pain was also associated with ligation. In addition women said that with ligation the site of the stitch might get infected, stitches might be torn off, the abdomen might become distended, health could deteriorate and women might even die. About 15% of women in the comparison area did not know of any side-effects resulting from ligation.

In the MCH-FP area respondents were concerned that condoms might tear during ejaculation, that they could cause ulcers in the male genitalia, burning of male and female genitalia and that condoms might enter into women's abdomen. In the comparison area 77% of the women were unable to state any side-effects associated with condoms.

Basically, the popular view of women as to the remedy for side-effects was that they should take nutritious food. Most women also said that they should inform the field worker or should seek advice from a doctor (Appendix Table 3).

Effectiveness

Most respondents in both the areas thought that pill, injection, condom and IUD were cent per cent effective, a result that was significantly higher in the MCH-FP area. A few stated that the effectiveness of these methods was 50-75%. Nearly all respondents in the MCH-FP and comparison areas said that ligation was cent per cent effective.

Knowledge about the iron tablets in pill cycle

In the MCH-FP area 80% of women knew that the 'brown tablet' was an iron tablet and was used to counteract anemia. Only 10% of women in the comparison area said it was an iron tablet but the majority mentioned that the brown tablet was a vitamin tablet (Table 4). This answer

recognizes the dietary benefits of the brown tablet. However, 33% of the respondents in the comparison area did not know that the iron tablet counteracted anemia.

Table 4. Knowledge of iron tablet in a strip of contraceptive pills by study area

Aspects of knowledge	MCH-FP area % (n=250)	Comparison area % (n=350)
What is the brown tablet		
Iron tablet	80.8**	10.0
Vitamin tablet	18.0	58.6**
Don't know	1.2	31.4**
Has any relation with menstruation		
Yes	99.6**	75.77
No	0.4	24.3**
Relationship with menstruation		
Menstruation would start	99.6**	74.9
Don't know	0.4	0.8
Advantages		
Correction of aneamia	35.6**	18.9
Increase energy	66.0**	47.7
Improvement of health	1.6	2.0
Menstruation would be clear	-	1.7
Don't know	0.4	32.6**
If forgotten to take tablet		
Take the missing tablet	76.4**	26.9
Nothing to do	21.2	29.7*
Don't know	2.4	43.4**

* Significant at $p < 0.05$
** Significant at $p < 0.01$

In both the areas most women knew that when the iron tablet was taken, menstruation starts but this knowledge was significantly higher among MCH-FP respondents. In both the areas women had no specific knowledge about what course of action to take if they forgot to take the iron tablet. About 76% of the respondents in the MCH-FP area mentioned taking the missing tablet if forgotten. But in the comparison area most did not know what to do.

Influence of demographic and socioeconomic variables on contraceptive knowledge

Effect of demographic and socioeconomic variables on knowledge is shown in Appendix Tables 4 to 6. We have included only a few selected programme elements in these tables which we felt to be the minimum knowledge that women need to use methods effectively. The analysis including all the elements and important findings are discussed. BRAC eligibility is used in this study as a proxy for economic status.

In both the areas no single demographic and socioeconomic variable explained all aspects of contraceptive knowledge (Appendix Tables 4-6). In MCH-FP area level of education and economic status had no major influence but age of respondents had a significant influence on the knowledge of proper use, advantage, and iron tablet. In the comparison area, level of education had a significant influence on knowledge about iron tablet and age exerted a significant influence on the knowledge of nature, side-effect and iron tablet. Household economic status had a role in comparison area on proper use and advantages of pill.

In MCH-FP area, level of education and age had a significant influence on knowledge about use of injection. Economic status had no influence on the overall knowledge of injection. In the comparison area level of education had a significant influence on the knowledge of category and indication. Age had a significant influence on the knowledge of indication and side-effects. The level of knowledge on category significantly varied with the variation of economic status.

In the MCH-FP area the level of education had a significant influence on the knowledge of nature and effectiveness of condom. Variation in age and economic status had no influence on the overall status of knowledge of condom. In the comparison area significant influence of education was seen on the knowledge of nature, category and advantage of contraceptives. The variation of age had a significant influence on category and proper use, and risk and effectiveness of condom. The level of knowledge on proper use of condoms and its advantages significantly varied with the variation of economic status.

In the MCH-FP area demographic and socioeconomic variables had no influence on the overall status of knowledge of IUD. In the comparison area level of education had a significant influence on the mode of IUD use. The level of knowledge on category, mode of use and effectiveness significantly varied with age. A significant influence of economic status was seen on

the knowledge of mode of use and advantage of IUD. In the MCH-FP area demographic and socioeconomic variables had no influence on the overall status of knowledge of ligation. In the comparison area, education and age had no influence on the overall status of knowledge of ligation, but economic status had a significant influence on the indication and advantage of ligation.

Knowledge on the source of information and supply

Sources of information were categorized in our study in two ways: interpersonal communication, that is the communication of clients with fieldworkers, friends, neighbours and relatives, and through radio. In the MCH-FP area community health workers (CHWs) were the major source of information for all methods and no one mentioned the radio as the source of information. In the comparison area the government field workers, relatives and neighbours were equally important sources of information; only a small proportion said that radio was the main source.

In the MCH-FP area the major source of services supply was the CHWs. In the comparison area, 55% received service from the government workers, 22% from the pharmacy, and 20% from doctors. Respondents were asked about their course of action if services were not available. In the MCH-FP area, 51% said that they would buy contraceptives from pharmacy, and 49% would inform the field workers. In the comparison area, 68% mentioned that they would inform the field workers, and 17% would buy contraceptives from pharmacy.

DISCUSSION

This paper addressed an area which needed attention for the sustainability of family planning programme - clients' effective knowledge of contraceptive. We have measured the level of contraceptive knowledge of two groups of women, one who have been subjected to an intensive family planning programme of ICDDR,B and the other group that has not been affected by such a programme but had access to the government programme. The government and ICDDR,B family planning programme have claimed the availability of multiple methods to increase CPR and continuation rate, but surprisingly many women were not yet aware of all the methods provided by the programme, especially in the comparison area. In the MCH-FP programme area most respondents could name at least five modern methods compared to the comparison area where

they could name only three methods. Most of the women resorted only to injection and pill. Knowledge of male methods was negligible in the comparison area and even in the MCH-FP area the knowledge of vasectomy was very low.

Knowledge of the nature and category of methods is important for clients own satisfaction. Most of the women in both the areas had sufficient knowledge about the nature of pill and ligation but many had no idea about IUD and condom. Categorization of methods into temporary and permanent was higher in the MCH-FP area than the comparison area. Women should know the specific indication of methods as not all methods are suitable to everyone; for example IUDs are not recommended for women who have not borne any children. The study findings showed that women in both the areas had very little knowledge about the specific indication of many methods which may be due to the clients' not getting adequate information from the providers.

One important attribute of method failure is its improper use. The majority of women in the MCH-FP area knew the proper use of pill, injection and condom compared to the comparison area, where none of them had complete knowledge on the proper use of any of the methods. It may be due to the fact that the providers only give contraception education to the current users. Therefore, the programme should have a policy to educate all women on all methods of contraceptives. Women were confused about what to do if one or two pills were missed. This raises the question whether the providers themselves are clear on this or whether they fail to inform the clients properly. Even if women are highly motivated towards effective family planning, they are less likely to use any contraceptive methods in the absence of detailed information on the proper usage of a method.

Knowledge concerning mode of action may eliminate misconceptions about contraceptive methods (Swar-Eldahab, 1993). About the mechanism of action of pill and injection, women's general perception was that they act by damaging the sperm or ovum. The process by which these contraceptives prevent a pregnancy is probably too complex for women who are mostly illiterate or less educated to comprehend.

The majority of the women in the study area had no clear idea about the advantages of any of the methods. Most women in the MCH-FP area said that the main advantage of injectables was that one injection provided protection for three months and maintained privacy. For ethical

reasons, a question may arise, why women accept a method if they are unaware of its advantages. Informed choice is not possible without adequate knowledge on the comparative advantages and disadvantages of contraceptives. Therefore, it is necessary to educate the clients about the advantages of different methods for clients' own choice, satisfaction, confidence, and to ensure quality of care.

If the hormonal and clinical methods are not explained sufficiently and their potential side-effects are not appreciated, users are much more likely to discontinue. It is evident that unanticipated and unmanaged side-effects lead to disappointed clients, and result in discontinuation of contraceptive use (Kreager, 1977). This study revealed that most respondents were not aware of the side-effects of contraceptives. The impact of sporadic bleeding on religious custom, work habit, and sexual relations for these women is a vital consideration. In a study of eight developing countries, 50 to 70% women thought that the pill posed considerable health risks. Among them 26 to 60% had stopped taking pill because they worried about its safety, and a lower or similar percentage of never users said that they had not taken the pill for this reason (Grubb, 1987). Thus, indication and contraindication should be considered in relation to age of clients and concerning the health problem. For example, hormonal methods are strictly contraindicated if any client has or experience hypertension, headache, severe menstrual disturbances, and asthma.

About the side-effects of condom and IUD, women of MCH-FP area had some correct knowledge. They also bore misconceptions, such as condom may cause genital ulcer or may go into the female abdomen, IUD acts as barrier during coitus and may migrate into the abdomen. Knowledge on mode of action and basic physiology of the reproductive system can bring change in these traditional beliefs and fears. The side-effects of ligation were more often assumed than actually experienced. Furthermore, some women believed that after ligation there could be a chance of further pregnancy, whereas, if the operation was done perfectly, the ligation was fully effective. The perception of the risks of ligation and its socio-cultural unacceptability stem mainly from the dearth of knowledge. Thus, it is necessary that IEM messages deal at length with such fears, concerns, and inhibitions, and make users more aware.

Women's confidence in management of side-effects as well as safety of a method as it relates to the user's health is associated with the increased likelihood of its use. If clients have

clear knowledge, they are not unnecessarily anxious about their health, and this may be helpful to eliminate the myths and fears concerning contraceptive use. Therefore it is essential to provide detailed accounts of side-effects and how to recognize the 'warning signs' and deal with them when they occur, and inform the health workers. It is shown in this study that the majority of women in both the areas said that the side-effects of pill and injection has to be compensated by eating more nutritious food, and that they inform field workers and doctors in case of side-effects arising from the use of condom, IUD and ligation. It should not be necessary that clients have to call service providers every time side-effects occur, they should be knowledgeable about the common side-effects and psychological problems and how to manage them at home by themselves. At the same time they should be educated of the graver side-effects which they should inform field workers and doctors.

The perceived effectiveness is a prime consideration in method choice (Tanfer and Rosenbaum, 1986). The findings reveal that most of the women in both area have a satisfactory level of knowledge about the effectiveness.

Data on the sources of information have useful programmatic implications. They help identify the strengths and weaknesses in the family planning communication system. Identification of such weaknesses would help programme managers to determine the desired areas of improvements in the family planning communication system. It was seen that personal contact with CHWs in the MCH-FP area, and field workers, relatives and neighbours in the comparison area were the major sources of information. Radio was of minor importance. The major achievement of the ICDDR,B MCH-FP programme is largely due to its employment of trained CHWs who were able to provide adequate information rather than depending on friends' and relatives' knowledge. The importance of field workers as the major source of information on family planning is also discernible from the findings of other studies (Chowdhury et al., 1985; Mitra et al., 1985; Khuda and Mitra, 1986).

Study findings indicated that service providers put emphasis mainly on pill and injection. Even those women who have indications for IUD or ligation were never informed. Was this due to provider's negative attitude towards IUD or a tendency to avoid the botheration of dealing with its side-effects? These are still questions needing answers. Whatever the reason, this was a great deficiency in the quality of service. For proper dissemination of family planning messages

through interpersonal communication, the fieldworkers must be adequately trained on the side-effect management and the contraindication of all methods, so that they are better able to meet the needs of their clients. Also, effort must be made to ensure that field workers make at least two monthly home visits to all eligible women in their catchment areas. Furthermore, it is important that fieldworkers have relevant IEC materials in adequate quantities to be used for clients' motivation during home visits, as well as adequate training and supervision.

Majority of the women in the MCH-FP area mentioned that if services were not available they would buy the pill from pharmacy or inform CHWs, and in the comparison area the majority would inform the field workers. This is a major achievement of the programme, given that it has largely succeeded in making people motivated towards accepting family planning. However, there is still a large number of women who are not sure what to do, therefore, more intensive IEC efforts are needed to make them knowledgeable about family planning.

The findings show that the demographic variables seemed to have little effect on the level of knowledge on various methods of family planning. Very few of the coefficients are statistically significant.

CONCLUSION

The study findings provided deeper insights into the clients' effective knowledge on various contraceptive methods in Matlab thana. Women's knowledge seemed inadequate as demonstrated by various elements explained earlier. Women bore some doubts and confusions about various methods of contraceptives. Improving the level and quality of contraceptive knowledge may help alleviate these doubts and confusions. Effective knowledge can potentially aid the clients in influencing method choice, as well as increasing contraceptive use in general. The programme should pay more attention to providing complete information to the clients, so that informed choices could be made.

Our analysis of the data indicates that the overall status of knowledge is significantly higher in the MCH-FP area than in the neighbouring comparison area. These differences may reflect the comparatively higher level of education of MCH-FP respondents, presence of ICDDR,B programme in that area, and the poor quality of government services on which the

women in the comparison area mostly depended. Considerable progress can be made through the introduction of appropriately designed and carefully implemented programme, so that the gap between ICDDR,B and government programme performance can be narrowed down.

RECOMMENDATION

Based on the findings of this study the following suggestions are made for a more successful implementation successfulimplementation of the family planning programme.

1. The programme should think about the ways of widening individuals' knowledge of availability, source, cost, suitability etc. Of all methods including male methods.
2. The non-users should be made aware of family planning. This may be done by arranging an informal discussion with them on a weekly basis in the community in small groups. Collaboration with the government of Bangladesh and other NGOs may be taken into consideration.
3. Programme should provide detailed and equal accounts about indication, proper use, inherent characteristics, benefits, consequences and possible complications of different methods for the success of family planning programme, as well as for clients' own satisfaction and confidence.
4. Women should be provided with detailed information about common side-effects, psychological problems, and 'warning signs', how to deal with them at home and when to inform the providers. They should be given proper counselling before and after adopting contraception. The inform ation about the mechanism of action of these methods and basic knowledge on the physiology of the reproductive system may play an important role. It will be helpful to eliminate anxiety about their health, traditional beliefs, misconceptions and fears.

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Appendix 1: An explanation of expected knowledge of modern contraceptive methods

Pill: The pill is a highly effective temporary contraceptive method. It works to prevent ovulation by interfering with the hormonal changes occurring in the menstrual cycle, making cervical mucus thick and impenetrable to sperm and changing the endometrium. Reduces iron deficiency aneamia, regulates irregular menstruation, and use unrelated to sexual activity. Must be taken regularly, one tablet each day at the same time. Use of pill during lactation will decrease breast milk. Blood pressure can be affected by the hormones in the pill. Other minor side effects such as breast tenderness, headache, nausea, weight gain or loss are the disadvantages.

When a woman starts taking pill she should start on the first day of her menstrual cycle (earlier instructions were to start on the 5th day of the cycle). Should take one pill each day until all the pills of a cycle are finished. If someone has been forgotten to take one pill she should take it as soon as she remembers, and if two pills are missed additional contraception should be used for the following days.

Injectables: Injections are usually given at three months' intervals. It is temporary and extremely effective. It prevents pregnancy by suppressing ovulation in many cycles and changing the cervical mucus to make it inhospitable to sperms and thinning the endometrium. Can be administered by trained nurses and midwives. No effect on lactation and cardiovascular system. Use unrelated to sexual activity. Disadvantages are that it causes disruption of the menstrual cycle, often initial heavy bleeding leading to amenorrhoea in about 50% of users and prolonged infertility occurs after its use. May cause weight gain.

IUD: A plastic or copper-bearing device placed in the uterus. Its mode of action is not fully understood. It may prevent the egg being fertilized by the sperm. Can be left in place for 2-4 years. The most propitious time for IUD insertion is during menstruation or within 10 days of the beginning of a menstrual period or 6-8 weeks after delivery. Insertion can be done by a well-trained health worker. Use unrelated to sexual activity. Careful insertion is needed to avoid undue pain or perforation of the uterus. Unsuitable for women who have not had a pregnancy. Increased bleeding may lead to aneamia, especially in the first few months. The device may be expelled. Side effects are uterine perforation may occur, menstrual problems, pain, infection and ectopic pregnancy.

Condom: It is a male method. It is a thin sheath of rubber which covers the erected penis and collects the sperm within it, thus preventing sperm from entering the vagina. Each condom can be used for once only. It gives some protection against STD/AIDS. The man or woman may be allergic to the rubber. It has no clinical side-effect. It may slip off or torn during coitus due to incorrect use.

Ligation: Female sterilization is a permanent method in which the fallopian tubes are closed by tying and cutting. There no serious long term side-effects are reported. It does not affect the menstrual cycle or libido. There may be complication at or soon after the operation, including infection and bleeding.

Appendix Table 1: Percentage distribution of respondents according to their knowledge on who should use specific methods.

Characteristics	Pill		Injection		IUD		Ligation	
	MCH-FP	Comparison	MCH-FP	Comparison	MCH-FP	Comparison	MCH-FP	Comparison
General indication								
Male	1.2	0.3	1.2	0.3	0.8	2.0	0.8	0.9
Female	98.8	98.8	98.8	97.4	99.2**	89.4	96.0**	84.9
Both		0.3	-	1.1	-	0.6	3.2	0.6
Don't know	-	0.6	-	1.2	-	8.0	-	0.6
Specific indication								
<35 years of age	8.0	72.6**	14.8	35.4**	-	0.9		
Newly married women	44.8**	5.6	-	-	0.4	6.3		
Having at least 1 child	22.4**	1.1	68.0**	28.6	98.0[1]**	78.6[1]	-	-
Having 2 children	20.0**	10.0	-	-	-	5.1	1.2	2.0
Having >3 children	2.8	4.3	-	-	-	-	89.6	91.4
Don't know	0.8	3.1	0.4	2.9	0.4	8.6	-	2.6
Other	0.8	2.3	16.8	33.1**	1.2	0.5	9.2	4.0

Notes: ** Significant at P< 0.01

[1] Women having 1 or 2 children.

Appendix Table 2: **Percentage distribution of respondents according to their knowledge on side effects caused by various contraceptives and their management**

Side effects	MCH-FP area	Comparison area
Pill		
Health deteriorates	9.2	4.6
Hypertension	40.8**	8.0
Headache	15.6	14.0
Nausea	56.8**	26.9
Irregular menstruation	12.4	15.4
Weakness	38.0	49.7**
Giddiness / vertigo	59.2	58.6
Burning in hand & feet	-	3.4
Heavy menstruation	0.4	1.1
Weight loss	-	0.6
Sleeplessness	0.4	0.3
Don't know	-	2.3
Injection	1.6	4.9*
Eye disease	0.4	0.3
Headache	-	0.6
Nausea	-	0.6
Irregular menstruation	33.3**	22.6
Weakness	44.4	51.1
Giddiness / vertigo	11.6	18.6
Burning in hand & feet	2.8	0.6
Heavy menstruation	61.2**	36.9
Weight loss	0.4	0.3
Prolonged amenorrhoea	14.4	14.3
Fever at night	-	0.3
Don't know	0.4	10.6*
Condoms		
It may tear	84.4**	20.9
Cause ulceration in male genitalia	1.2	-
It may go into the female abdomen	0.4	1.4
Burning of male and female genitalia	-	0.3
Don't know	13.6	77.4**

Cont'd

Appendix Table 2 continues

IUD		
Uterine infection	63.6**	23.4
Lower abdominal pain	33.2**	14.9
Expulsion of IUD	3.6	11.7**
Acts as a barrier during coitus	0.4	0.3
Migrate into the abdomen	2.0	0.6
Pain in urethra	0.4	-
Can't move	-	0.3
Giddiness / vertigo	2.4	3.7
Heavy menstrual bleeding	59.2**	34.0
Prolonged amenorrhoea	-	0.3
Don't know	0.8	32.0**
Ligation		
Method failure	4.8	-
Death	4.8	1.1
Distension of Abdomen	1.2	-
Stitch may torn off	8.8**	2.9
Unable to do heavy work	6.4	18.9**
Infection at the site of stitch	3.2	4.2
Lower abdominal pain	52.8**	19.1
Can't move	-	1.1
Irregular menstruation	-	0.6
Weakness	57.6	55.4
Giddiness / vertigo	2.4	2.0
Heavy menstrual bleeding	1.6	2.3*
Weight loss	0.8	0.9
Don't know	1.6	15.2**
N=	250	350

* Significant at P< 0.05

** Significant at P< 0.01

Appendix Table 3: Respondents knowledge on side effects management by method and area (Percentages)

Side effects management	Pill		Injection		IUD[1]		Ligation	
	MCH-FP	Comparison	MCH-FP	Comparison	MCH-FP	Comparison	MCH-FP	Compari
Take nutritious food	50.0	47.4	50.4	39.4	0.8	-	0.4	-
Inform field worker	30.4	33.2	44.4	32.3	95.2	38.3	94.0	40.9
Get doctor's advice	2.8	11.0	5.2	22.3	4.0	51.7	5.6	55.1
Take plenty of water	14.0	3.3	-	-	-	-	-	-
Don't know	2.8	5.1	-	6.0	-	8.9	-	4.0

Notes: 1 Four women in the comparison area said that husband should be informed.

Appendix Table 4: **Percentage distribution of respondents according to contraceptive knowledge under selected determinants of knowledge by education and study area.**

Program elements & contraceptive methods	EDUCATION (in years) and STUDY AREA					
	None		1-5 years		6 + years	
	MCH	Comp.	MCH	Comp.	MCH	Comp.
Indication						
Pill	50.0	76.2	52.1	78.4	56.6	91.7
Injection	81.7	58.7**	80.3	71.6**	84.9	75.0**
IUD	96.8	76.6	100.0	82.4	98,1	87.5
Ligation	69.2	49.1	75.3	50.2	75.0	53.4
Proper use						
Pill	99.2	76.6	97.2	86.5	100.0	79.2
Condom	96.8	15.5	98.6	20.3	94.3	25.0
Side-effects						
Pill	95.2	84.1	97.2	83.8	94.3	95.8
Injection	100.0	97.6	100.0	100.0	100.0	100.0
Condom	90.0	16.3	92.5	20.0	93.1	24.7
IUD	100.0	74.2	100.0	75.7	100.0	83.3
Ligation	3.1	0.0	4.5	2.4	4.3	3.9
Management of side-effects						
Pill	32.5	43.3	32.4	51.4	35.8	45.8
Injection	49.2	51.6	47.9	60.8	52.8	66.7
IUD	100.0	90.5	97.2	90.5	100.0	83.3
Ligation	100.0	95.2	100.0	97.3	98.1	100.0
Effectiveness						
Pill	100.0	88.9	98.6	91.9	96.2	91.7
Injection	99.2	89.7	98.6	91.9	98.1	100.0
Condom	92.1+	73.8	90.1+	81.1	81.1+	75.0
IUD	100.0	79.4	100.0	79.7	100.0	95.8
Ligation	100.0	96.8	98.6	97.3	98.1	100.0
Knowledge about iron tablets	88.1	59.1**	94.4	73.0**	94.3	75.0**

Notes: MCH = MCH-FP programme area
Comp. = Comparison area
** P < 0.01
+ P < 0.10

Appendix Table 5 **Percentage distribution of respondents according to contraceptive knowledge under selected determinants of knowledge by age and study area.**

Program elements & contraceptive methods	AGE GROUP AND STUDY AREA							
	< 20		20-29		30-39		40+	
	MCH	Comp.	MCH	Comp.	MCH	Comp.	MCH	Comp.
Indication								
Pill	55.6	78.1	54.7	78.0	47.7	77.8	53.6	76.8
Injection	66.7	75.0*	84.9	66.9**	81.4	61.5**	81.2	48.2*
IUD	100.0	81.3	100.0	81.1	98.8	80.0	94.2	67.9
Ligation	70.5	50.2	73.0	53.8	69.5	48.3	67.2	45.0
Proper use								
Pill	88.9**	81.3	100.0**	83.5	98.8*	76.3	98.6**	73.2
Condom	100.0	12.5*	96.5	21.3**	96.5	18.5**	97.1	7.1*
Side-effects								
Pill	100.0	90.6*	97.7	89.8**	91.9	83.0**	97.1	75.0*
Injection	100.0	100.0*	100.0	100.0**	100.0	97.8**	100.0	94.6*
Condom	90.0	14.5-	93.5	20.5-	91.3	21.4-	96.5	10.0-
IUD	100.0	78.1	100.0	73.2	100.0	78.5	100.0	69.6
Ligation	2.3	1.9	4.0	2.2	3.4	1.2	2.2	0.0
Management of side-effects								
Pill	44.4	56.3	36.0	41.7	29.1	48.9	33.3	37.5
Injection	55.6	50.0	51.2	61.4	48.8	52.6	47.8	46.4
IUD	100.0	90.6	98.8	89.0	98.8	90.4	100.0	91.1
Ligation	100.0	96.9	100.0	96.9	98.8	96.3	100.0	92.9
Effectiveness								
Pill	100.0	93.8	98.8	92.1	97.7	88.9	100.0	83.9
Injection	100.0	90.6	97.7	92.9	98.8	89.6	100.0	89.3
Condom	77.8	75.0-	86.0	79.5+	90.7	76.3-	92.8	64.3-
IUD	100.0	75.0*	100.0	86.6**	100.0	80.7**	100.0	69.6*
Ligation	100.0	96.9	100.0	96.9	98.8	97.0	98.6	98.2
Knowledge of iron tablet	77.8+	75.0*	95.2+	66.9**	87.2+	63.0**	92.8-	48.2*

Notes: MCH = MCH-FP programme area
Comp. = Comparison area
**P < 0.01

Appendix Table 6 **Percentage distribution of respondents according to contraceptive knowledge under selected determinants of knowledge by BRAC eligibility[1] status and study area.**

Program elements & contraceptive methods	BRAC ELIGIBILITY AND STUDY AREA			
	BRAC eligible		BRAC non-eligible	
	MCH-FP	Comparison	MCH-FP	Comparison
Indication				
Pill	50.9	76.8	52.9	80.2
Injection	78.1	59.8	85.3	70.3
IUD	97.4	77.6	98.5	81.3
Ligation	73.6	44.1**	75.0	55.5**
Proper use				
Pill	99.1	75.7**	98.5	87.9**
Side-effects				
Pill	93.9	83.0	97.1	90.1
Injection	100.0	98.5	100.0	97.8
IUD	100.0	73.4	100.0	80.2
Ligation	2.3	0.0	4.3	3.1
Management of side-effects				
Pill	31.6	44.0	34.6	48.4
Injection	50.0	52.5	49.3	60.4
IUD	99.1	89.2	99.3	92.3
Ligation	100.0	95.4	99.3	97.8
Effectiveness				
Pill	99.1	88.8	98.5	92.3
Injection	98.2	89.2	99.3	95.6
IUD	100.0	80.3	100.0	81.3
Ligation	100.0	96.9	98.5	97.8
Knowledge about iron tablet	91.2	60.2	91.2	71.4

Notes: 1 Used as a proxy for economic status.
** $P < 0.01$