

ORAL CONTRACEPTIVE NON-COMPLIANCE IN RURAL BANGLADESH

M. ASADUZZAMAN KHAN

*School of Health, University of New England, Australia and
Department of Statistics, University of Dhaka, Bangladesh*

Summary. This paper examines incorrect use of oral contraceptives (OCs) in rural Bangladesh by using data from an OC compliance survey. Of the 1031 current users of OCs interviewed, about 13% took their pills out of sequence, while 17% left incorrect intervals between pill packs. Forty per cent of the women reported missing one active pill during the 6 months prior to the survey, and 74% of them took correct action with the missed pill. Of the women who missed two active pills (16%), only 9% took correct action. Multivariate analyses revealed that women's education and their husbands' support helped protect against taking incorrect action with a missed pill. The fieldworker's contact was found to protect against leaving an incorrect interval between pill packs. Women who had membership of non-government organizations were less likely to interrupt their pill use, and more likely to take their pill out of sequence. The present study underscores the need for providing women with more support in their pill use, and advocates that service providers should be the focal point of efforts. Husbands' support is essential to improve the pill-taking behaviour of Bangladeshi women.

Introduction

Oral contraceptives (OCs) are highly effective in preventing conception. Among the perfect users (i.e. women who miss no pills, and follow the instructions exactly) only about one in 1000 women is expected to become pregnant within the first year of their pill use (Hatcher & Guillebaud, 1998). However, OC failure rates are considerably higher among the typical users (i.e. women who take pills but do not necessarily follow the instructions). About 60 to 80 women in every 1000 typical OC users are expected to become pregnant during the first year of their pill use (Moreno & Goldman, 1991; Hatcher & Guillebaud, 1998). An analysis of data from six developing countries showed that pregnancy rates ranged from 45 per 1000 OC users in Thailand to 165 per 1000 OC users in Egypt (Ali & Cleland, 1995). This disparity between the proportions of perfect users and typical users suggests that OCs are being used incorrectly by many women.

Available evidence suggests that incorrect OC use, often called poor OC compliance, can have adverse effects on women's health, which may also have long-term consequences. Problems related to poor OC compliance include: sporadic use (i.e. frequent starting and stopping), not using a back-up contraceptive method when indicated, and discontinuation of taking the pills but failure to substitute another method while still at risk for unintended pregnancy (Rosenberg & Waugh, 1999). The broad issue of poor OC compliance is inextricably linked to the issue of unintended pregnancies, since few would otherwise be concerned about the errors in pill use. Poor OC compliance may have no immediate or uniform consequences for individuals, but such problems that result in unintended pregnancies can create a true public health problem in the long run.

Oral contraceptives are by far the most popular form of reversible contraceptives used in Bangladesh. Over the last two decades, there was a seven-fold increase in the use of OCs; about 23% of the women were currently using OCs, accounting for 53% of all modern method use in Bangladesh in 1999–2000 (NIPORT, 2000). Despite the widespread use of OCs, their incorrect use is fairly common in the country. A study designed to assess the level of non-compliance among 175 pill users in rural Bangladesh demonstrated a disturbing level of non-compliance with pill use, with 87% having missed at least one pill per cycle (Seaton, 1985). This study indicated a number of misuses of pills: such as failure to take the pills daily, skipping pills when travelling or ill, and not taking them at all when their husbands are away from home. A pill-use study revealed that only 37% of rural users and 24% of urban users surveyed knew when to begin their next 28-day pill pack, while 47% of rural users and 59% of urban users reported that they waited for evidence of menstruation between pill packs (Larson *et al.*, 1991). A recent study reported a considerable inconsistency in the use of OCs in rural Bangladesh (Khan *et al.*, 2002). This study revealed that nearly half of the OC users (49%) missed one or more active pill(s) during the 6 months before the survey. In addition, failure rates of OCs are relatively high in Bangladesh, ranging from 3% to 15% within the first year of acceptance of OCs (Bairagi & Rahman, 1996; NIPORT, 2000). It is, therefore, warranted to have an understanding of how the women take their pills, and what the factors are that constrain their correct pill use. This is important because the efficacy of OCs is mainly associated with women's use-related behaviour, especially the consistency with which they take the pills (Potter, 1991; Benagiano, 1992).

Given the importance of adherence to OC regimens for the pills to be effective, none of the recent studies has explored the pill-taking behaviour of Bangladeshi women. The present study has focused on OC users' levels of incorrect use, along with the identification of factors that predict incorrect use of OCs. The data used for this study provide a unique opportunity to comprehensively assess poor OC compliance. The importance of the present study is in the provision of information that health care providers and policymakers could use to redesign strategies to improve the pill-taking behaviour of rural Bangladeshi women.

Data and methods

The data for this study were drawn from a cross-sectional national survey that investigated the level of knowledge, attitudes and practices (KAP) concerning specific

issues of OC compliance in rural Bangladesh. This KAP survey was conducted between April 1995 and June 1996, and a three-stage sampling procedure was employed to select the OC users for the survey (discussed elsewhere: Khan *et al.*, 2002; Khan, 2003). A total of 1600 OC users, current or past, who were served by the family planning (FP) fieldworkers, predominantly from non-government organizations (NGOs), were interviewed. Of them, 1031 were currently using OCs at least for the 6 months prior to the survey. These current OC users constitute 64% of the total sample surveyed, and form the basis of the present study. The study participants were using 28-day pill packs with 21 active hormone pills and seven iron pills or placebos.

In the present study, a woman's OC use status was based on her self-reported retrospective pill-taking behaviour. Information on woman's contraceptive behaviour was double-checked using the information on the Family Welfare Assistant (FWA) register, which was updated every 2 months through home visits by the fieldworkers. Earlier studies on OC compliance documented four user-related behaviours as measures of incorrect use of OCs: taking pills out of sequence; interruption in pill use; incorrect action taken with the missed pill(s); and failure to observe the correct interval between completing one pill pack and beginning the next (Hubacher & Potter, 1993; Trottier *et al.*, 1994). These were considered as the outcome measures of interest for the present study.

The correct sequence of OC use is often indicated by an arrow on the pill pack, and failure to follow the sequence represents the *first* type of incorrect use. With 28-day pill packs, pills are arranged in four rows: the first three rows with 21 active hormone pills, and the last row with placebo tablets, which often contain iron for blood. Thus, the users must follow the pack arrows correctly to avoid taking placebo tablets when they should be taking active pills. An interruption in OC use is defined simply as any failure to take one or more active pills for every required day, which can alter the hormonal balance, and increase the possibility of ovulation (Landgren & Csemiczky, 1991). This interruption forms the *second* type of incorrect use. The *third* type of incorrect use is the failure to take correct action with the missed pill(s). With an active missed pill, the universally recommended action is to take the missed pill as soon as the person remembers, no matter when this occurs, and then take the next pill at the regular time, even if it means taking two pills in one day. If someone misses two active pills in a row, it is recommended to take two pills as soon as this is remembered, and take two pills the next day, then continue to take the rest of the pills at the regular time. In addition, use of a back-up method of contraception is also recommended for the rest of that cycle. For three missed pills, it is recommended to use a back-up method of birth control until the start of a new pill pack (Hatcher & Guillebaud, 1998). Finally, the *fourth* type of incorrect use occurs when women do not wait the correct amount of time between the completion of one pill pack and the beginning of the next. However, women using 28-day pill packs should start the next pill pack immediately after completing the earlier one.

The explanatory variables for this analysis were chosen on the basis of prior knowledge of their association with contraceptive use and preliminary data analysis. The three demographic variables considered in the analysis were: woman's age, number of living children and administrative division. Socioeconomic variables selected for the analysis were: woman's education, their husbands' education and

occupation and access to radio or television. Earlier research has shown that non-Muslim couples have a higher probability of using modern contraceptives than their Muslim counterparts (Kamal, 1994). One recent study has revealed that inconsistent use of OCs is more prevalent among Muslim women (Khan *et al.*, 2002). Religion was therefore included in the analysis. There is also evidence to suggest that women's use-related variables play an important role in the efficacy of OC use (Potter, 1991; Benagiano, 1992; Forrest, 1994). These included: use of contraceptive method before OCs, duration of OC use, and experience of side-effects during the first 3 months of OC use. Recent research has demonstrated that the husband has an important role and could be instrumental in his wife's contraceptive use (Kamal, 2000; Khan, 2003). It has also been documented in the literature that women's membership of an NGO results in higher use of contraceptives (Schuler & Hashemi, 1994). Husbands' support and NGO membership were therefore included in the analysis. Past studies have demonstrated that the success of contraceptive use largely depends on a number of service-related variables (Hossain & Phillips, 1996; Janowitz *et al.*, 1999; Mannan, 2002; Khan, 2003). These variables were: home visits by a fieldworker, source of contraceptive information and source of contraceptive supply.

Before conducting multivariate analysis, relationships among the variables initially considered were examined to assess the possibility of collinearity among the potential predictors. Husband's occupation was dropped from the analysis because of its considerable degree of association with their education. Number of living children was also omitted from the analysis because of its collinearity with woman's age. Logistic regression analyses were then carried out to identify factors that had an independent effect on each of the four dichotomous outcome measures of incorrect OC use. The backward elimination method was used to choose the best-predicted models from among all selected variables. Only the variables with a significant relationship with each of the outcome measures are presented in this paper.

This study has a number of limitations. The findings of the present study may be affected by recall bias because they relied on respondents' memory for past events, such as missed pill(s), action taken with missed pill(s), duration of OC use and experience of side-effects. However, the findings of association seem unlikely to be distorted unless various levels of the factors being examined have different effects on the respondent's memory. A second limitation of this study is that it could not take into account the roles of fieldworkers in incorrect use of OCs. Furthermore, the cross-sectional design of this study is often considered as a weak design for assessing causality, so that the results do not allow any conclusive decision to be drawn about what causes what.

Results

Sample characteristics

Table 1 presents the demographic characteristics of the study participants. All women studied were currently married, aged 15–49 years (mean 29.7 years, SD=7.52), and were current users of OCs at the time of the survey. Although the average number of living children was 3.6 (SD=2.26), 29% of the women reported having had

Table 1. Sociodemographic characteristics of study participants (oral contraceptive users) in rural Bangladesh, 1995–96

Characteristics	Percentage (<i>n</i> =1031)
Women's age (years)	
15–24	27.4
25–34	45.2
35–49	27.4
Religion	
Muslim	90.2
Non-Muslim	9.8
Women's education	
No education	53.2
Primary	32.4
Secondary +	14.6
Husbands' education	
No education	43.6
Primary	22.4
Secondary +	33.9
Husbands' occupation	
Agriculture	39.1
Daily labour	20.6
Business/small trade	25.8
Other	14.5
Administrative division	
Chittagong	18.1
Dhaka	26.4
Rajshahi	36.5
Khulna/Barishal	19.0
Land ownership	
Own land	52.9
Do not own land	47.1
Access to television and/or radio	
Yes	59.9
No	40.1
Number of living children	
0–2	39.2
3–4	32.1
5+	28.7

five or more children. The overwhelming majority of the women interviewed were Muslim (90%). About 53% of the women had no formal education, but their spouses were slightly more educated (44% no schooling). More than half of the women (53%)

Table 2. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) from multivariate logistic regression analysis showing the risk of taking pills out of sequence, by characteristics, 1995–96

Characteristics	Percentage taking pills out of sequence	Adjusted OR ^a (95% CI)
Administrative division		
Chittagong	15.5	1.0 ^b
Rajshahi	9.6	0.51* (0.30–0.88)
Dhaka	12.5	0.73 (0.42–1.25)
Khulna/Barishal	19.4	1.23 (0.72–2.09)
Membership of NGOs		
No	12.1	1.0 ^b
Yes	16.5	1.59* (1.07–2.36)

Hosmer and Lemeshow goodness-of-fit test: $\chi^2=3.27$; $df=5$; $p=0.66$.

^aAdjusted for all other factors. ^bReference category.

*Wald p value < 0.05.

Variables not entered in the model are not shown in the table. These include: access to television/radio, source of contraceptive supply and husband's support in pill use.

reported not owning any land for cultivation, although agriculture was reported as the main occupation (39%). About three-fifths of the women interviewed had access to media such as radio or television. The average duration of OC use was 2.7 years (SD=2.4) with about a quarter of the women using OCs for less than a year.

Logistic regression models

Four logistic regression models were constructed to identify predictors of incorrect OC use, and are presented in the form of odds ratios and confidence intervals (Tables 2–5). The goodness-of-fit (Hosmer and Lemeshow) test results for each model are presented at the bottom of each table.

Pill sequence. The study participants were asked to show the interviewer the sequence they follow to take the pills. About 13% of the women had taken the pills out of sequence. The logistic regression analysis revealed that the proportion of women taking the pills in an incorrect sequence varied across different parts of the country; women of Rajshahi division had half the risk of taking the pills out of sequence compared with the women of Chittagong division (OR=0.5; 95% CI, 0.30–0.88) (Table 2). Also, women who were involved with any NGOs such as Grameen Bank, Bangladesh Rural Advancement Committee, Bangladesh Rural Development Board etc. were more likely to take the pills out of sequence than their counterparts who were not involved with such NGOs (OR=1.6; 95% CI, 1.07–2.36).

Table 3. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) from multivariate logistic regression analysis showing the risk of missing an active pill^c, by characteristics, 1995–96

Characteristics	Percentage who missed an active pill ^c	Adjusted OR ^a (95% CI)
Administrative division		
Chittagong	35.8	1.0 ^b
Rajshahi	33.5	0.98 (0.68–1.43)
Dhaka	44.9	1.47 (0.99–2.16)
Khulna/Barishal	51.5	1.93** (1.27–2.93)
Membership of NGOs		
No	42.4	1.0 ^b
Yes	34.8	0.75 (0.56–1.00)
Duration of pill use (months)		
<12	48.9	1.0 ^b
12–23	45.4	0.92 (0.64–1.33)
24–47	36.1	0.64* (0.45–0.90)
48+	32.7	0.56** (0.38–0.82)

Hosmer and Lemeshow goodness-of-fit test: $\chi^2=3.81$; $df=8$; $p=0.87$.

^aAdjusted for all other factors. ^bReference category.

^cDuring 6 months prior to the survey.

*Wald p value < 0.05; **Wald p value < 0.01.

Variables not entered in the model are not shown in the table. These include: woman's education, woman's age, access to radio/television, experience of side-effects and source of contraceptive information.

Interrupted use of OCs and action taken. Women in the survey were asked if they had failed to take an active pill in the 6 months prior to the survey. About 40% of the women had missed an active pill during this time (416 of 1031). Logistic regression analysis revealed that interrupted use decreased steadily with increase of duration of OC use (Table 3). Interrupted use of OCs also varied across different parts of the country; women who were living in Khulna or Barishal division had almost double the risk of missing an active pill than did women in Chittagong division (OR=1.9; 95% CI, 1.27–2.93). Women who had membership of an NGO were less likely to miss an active pill than their counterparts who did not have such membership (OR=0.75; 95% CI, 0.56–1.00). The analysis also revealed that interrupted use by missing an active pill was inversely associated with the duration of pill use. Women using OCs for the last 4 years or so had the lowest risk of missing an active pill during the period (OR=0.6; 95% CI, 0.38–0.82).

Women who missed an active pill during the 6 months prior to the survey were also asked about their action with the missed pill. About a quarter of the women reported not taking correct action with the missed pill (108 of 416). Logistic regression analysis demonstrated that woman's education was inversely associated

Table 4. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) from multivariate logistic regression analysis showing the risk of not taking correct action with a missed active pill, by characteristics, 1995–96.

Characteristics	Percentage not taking correct action with a missed active pill	Adjusted OR ^a (95% CI)
Women's education		
None	30.0	1.0 ^b
Primary	26.7	0.87 (0.54–1.39)
Secondary+	8.9	0.26** (0.10–0.68)
Husbands' support in pill use		
No	33.1	1.0 ^b
Yes	21.8	0.63* (0.40–0.99)

Hosmer and Lemeshow goodness-of-fit test: $\chi^2=0.001$; $df=2$; $p=0.99$.

^aAdjusted for all other factors. ^bReference category.

*Wald p value<0.05; **Wald p value<0.01.

Variables not entered in the model are not shown in the table. These include: husband's education and source of contraceptive supply.

with taking incorrect action with the missed pill (Table 4). Women with secondary or higher education had a quarter of the risk of not taking correct action with a missed pill than did women who had no formal education (OR=0.26; 95% CI, 0.10–0.68). Also, husbands' support was found to be protective against incorrect action; women who had their husbands' support in their pill use were less likely not to take correct action with the missed pill than were women who did not have such support (OR=0.6; 95% CI, 0.40–0.99).

An attempt was also made to explore the interruption of OC use by missing two or three active pills and the action taken with these missed pills. About 16% of the women reported missing two active pills during the 6 months prior to the survey (163 of 1031); only 9% of them took correct actions with the missed pills (14 of 163). Approximately 6% of the women missed three active pills during the period (59 of 1031); only one of them took correct actions with the missed pills (data not shown).

Interval between pill packs. The next measure of incorrect OC use was whether women left the correct amount of time between the completion of one pill pack and the beginning of the next. About 17% of the women reported having left an incorrect interval between pill packs. As Table 5 reveals, Muslim women were less likely to leave the incorrect interval between pill packs than their non-Muslim counterparts (OR=0.4; 95% CI, 0.26–0.69). Incorrect leaving of interval varied significantly across different parts of the country. Compared with women of Chittagong division, women of Rajshahi division had 0.4 times the risk of leaving an incorrect interval between pill packs (OR=0.4; 95% CI, 0.26–0.68). Women who had access to radio and/or

Table 5. Adjusted odds ratios (ORs) and 95% confidence intervals (CIs) from multivariate logistic regression analysis showing the risk of not leaving a correct interval between pill packs, by characteristics, 1995–96

Characteristics	Percentage not leaving correct interval between pill packs	Adjusted OR ^a (95% CI)
Religion		
Non-Muslim	28.7	1.0 ^b
Muslim	15.2	0.42*** (0.26–0.69)
Administrative division		
Chittagong	23.4	1.0 ^b
Rajshahi	11.2	0.42*** (0.26–0.68)
Dhaka	15.8	0.61* (0.37–0.99)
Khulna/Barishal	21.4	0.82 (0.50–1.36)
Access to television/radio		
No	14.0	1.0 ^b
Yes	18.6	1.50* (1.05–2.14)
Duration of pill use (months)		
<12	22.1	1.0 ^b
12–23	17.7	0.74 (0.46–1.18)
24–47	15.2	0.65 (0.41–1.02)
48+	11.8	0.46** (0.27–0.77)
Fieldworker's visit		
No	25.5	1.0 ^b
Yes	15.4	0.55** (0.35–0.84)

Hosmer and Lemeshow goodness-of-fit test: $\chi^2=3.22$; $df=8$; $p=0.92$.

^aAdjusted for all other factors. ^bReference category.

*Wald p value < 0.05; **Wald p value < 0.01; ***Wald p value < 0.001.

Variables not entered in the model are not shown in the table. These include: woman's education, husband's education, number of living children and experience of side-effects.

television were more likely to leave incorrect interval between pill packs than their counterparts who did not have such access (OR=1.5; 95% CI, 1.05–2.14). The present analysis also revealed that the leaving of an incorrect interval decreased with increasing duration of pill use. Women who were using pills for the last 4 years or so had almost half the risk of leaving an incorrect interval between pill packs compared with their counterparts who were using pills for less than a year (OR=0.5; 95% CI, 0.27–0.77). Fieldworkers' contact was found to be protective against leaving an incorrect interval between pill packs. Women who were visited by FP fieldworkers were less likely to leave an incorrect interval between pill packs than were women who were not visited by the fieldworkers during the 6 months prior to the survey (OR=0.55; 95% CI, 0.35–0.84).

Discussion and conclusions

The present study demonstrated a considerable amount of incorrect OC use in rural Bangladesh, and identified some issues associated with poor OC compliance that deserve special attention to improve the pill-taking behaviour of rural Bangladeshi women.

The results show that home visits by FP fieldworkers had protective effects against the practice of leaving an incorrect interval between pill packs. Earlier research has reported that fieldworkers' contact effectively facilitates the consistent use of OCs in rural Bangladesh (Khan *et al.*, 2002). Also, a number of studies have shown a strong relationship between contact with FP fieldworkers and contraceptive use (Hossain & Phillips, 1996; Janowitz *et al.*, 1999). Given the strong association between fieldworkers' visits and contraceptive use, one might expect to use these contacts as an opportunity to provide information about how to take the pills correctly. Nevertheless, the FP programme of Bangladesh has recently shifted its emphasis from home delivery to a fixed-site, clinic-based service delivery system in order to provide a more holistic approach to reproductive health care. Under the government's recent 5-year plan for health and population (1998–2002), health and FP services have been delivered on a daily basis by the frontline health and FP fieldworkers at the one-stop service centres, called 'community clinics', in rural areas of Bangladesh (Government of Bangladesh, 1998). With this new system, pills are to be picked up from the community clinics that were previously delivered to the women's door by the fieldworkers. Like the Government of Bangladesh, the NGOs in rural areas are also shifting away from door-to-door distribution to fixed-site, clinic-based delivery of essential reproductive health care services (Schuler *et al.*, 2002). This new service delivery system, however, imposes some costs on women (in money and travel time) who wish to have access to certain services, and requires that women take a greater initiative than they used to do under the previous door-to-door delivery services. In addition, travelling in rural areas is often difficult because of unavailability of vehicles and poor road conditions. Since the door-to-door distribution strategy had led women to become accustomed to receiving services at home, a considerable amount of motivation is needed at this stage to make these community clinics more accessible to all who require them.

The findings of the present study also revealed that husbands' support was protective against taking incorrect action with a missed active pill. Available evidence suggests that husbands could play an important role in helping their wives use contraceptive methods correctly, especially when social restrictions limit women's mobility (Terefe & Larson, 1993). Husbands could also be instrumental in their wives' continued use of OCs. A much earlier study conducted among 200 Iranian women reported that only 12% women continued their pill use for 6 months when the pills were administered by themselves, while the continuation rate was 93% when the pills were administered by their husbands (Siassi, 1972). A recent study reported that women with their husbands' support in pill use had half the risk of discontinuing pill use when compared with women who did not have such support (Khan, 2003). In a male-dominated society like Bangladesh, where the decision to delay or avoid bearing more children depends mostly on men, the country's reproductive health programmes

must target men in addition to its traditional emphasis on women. The Government of Bangladesh has recognized the importance of men's involvement in reproductive health care. However, specific initiatives to motivate or to involve men in the country's FP programme are yet to be implemented.

As expected, education could play an important role in the adherence to OC regimens. A compliance study in Egypt reported that illiterate women did worse than their literate counterparts on all the four measures of correct OC use. The former were more likely than the latter to interrupt use, more likely to take incorrect action after missing one active pill, more likely to take the pills out of sequence, and more likely to follow an incorrect procedure between pill packs (Hubacher & Potter, 1993). In the present study, women's education was found to be protective against interruption in OC use. This could be because women with some education enjoy a greater ability to read the instructions on OC use, and can act accordingly.

Women with access to television and/or radio were more likely to leave an incorrect interval between pill packs compared with women who did not have such access. Recent research showed that women exposed to FP messages on radio and/or television were more likely than other women to use contraceptive methods (Kabir & Islam, 2000). These media in Bangladesh, however, are being used for the purpose of promoting different brands of OCs without emphasizing their effectiveness. Thus, there is an opportunity to use these media to convey culturally appropriate, easy to understand and follow OC-related specific messages about how to use OCs correctly, along with the benefits of correct and continued use.

The present study also attempted to examine whether there was any relationship between incorrect OC use and being a member of an NGO such as the Grameen bank, Bangladesh Rural Advancement Committee and Bangladesh Rural Development Board, most of which are involved in providing micro-credit support to their members. The findings of the present study revealed that women who had membership of such NGOs were less likely to interrupt their OC use, but more likely to take the pills out of sequence than their counterparts who did not have such membership. Earlier research has demonstrated that women's participation in credit programmes leads to an increase in the use of contraceptives and subsequent decline in fertility (Schuler & Hashemi, 1994). One recent study conducted among 4333 women of rural Bangladesh revealed that after 2 years of membership with the micro-credit programmes, women with membership were 1.8 times more likely to use contraceptives than were non-members in the same areas (Steele *et al.*, 2001). The present study, however, suggests that further research is needed to explore the role of such NGO membership in the effectiveness of contraceptive use.

The results of the present study indicated spatial differences in the effective use of OCs. Anecdotal evidence suggests that rather than socioeconomic differences, cultural differences could be more responsible for regional variations across different parts of the country (Amin *et al.*, 1993; Dev *et al.*, 2002). For example, Chittagong division is lagging behind the rest of the country in contraceptive use and fertility decline despite the relatively higher level of conventional socioeconomic indices (e.g. *per capita* GNP, non-agriculture occupation). However, the people of Chittagong region are culturally different from other parts of the country because of their strong adherence to traditional beliefs and values (Khan & Reaside, 1998). Earlier studies

have also revealed that women of Chittagong division are less involved in family decision-making and more prone to home confinement (Huq & Cleland, 1990; Mitra & Associates, 1992). In addition, programme factors are acting differently across the country. For example, the most recent Bangladesh Demographic and Health Survey has reported that the government fieldworker visits for FP services are much lower in Chittagong division than the other parts of the country (e.g. visits are 14% in Chittagong division compared with 28% in Khulna division) (NIPORT, 2001).

Religious affiliation was found to be significantly associated with incorrect use of OCs. Muslim women were more likely to leave correct intervals between pill packs than their non-Muslim counterparts. This finding contradicts the results from an earlier study that Muslim women are more prone to be inconsistent OC users compared with their non-Muslim counterparts (Khan *et al.*, 2002). Though there have been a number of attempts to measure the influence of individual's religiosity on contraceptive use (Bernhardt & Uddin, 1990; Kamal & Slogget, 1993), little is known about linkage between religion and effectiveness of contraceptive use. One study, however, has reported that individual religiosity does not pose a significant barrier to the adoption of contraceptive or its continued use (Amin *et al.*, 1996). This study has suggested that the influence of religion may have an indirect impact on contraceptive practice by working through women's status and their freedom of movement within the community. One may argue that such characteristics may be linked with contraceptive effectiveness. However, this deserves further investigation to find the pathways of how religious affiliation influences the effectiveness of contraceptive use.

Although much of this article has focused on the characteristics of women who take the pills incorrectly, the problem can be traced to all other potential sources that are involved with the process of OC use. For instance, the manufacturers do not always agree on the instructions as what to do with missed pills (Williams-Deane & Potter, 1992). Such a lack of agreement could cause confusion among health care providers as well as the pill users, especially when the users change brand or share information about different brands among themselves. Furthermore, in Bangladesh, pill packets generally contain three cycles of pills along with one instruction sheet written in Bengali. Most often the fieldworkers supply one or two cycles of the pill packet without the instruction sheet. As such, the pill users miss the opportunity to consult the pill-taking instructions. In addition, the findings of the present study have demonstrated a considerable amount of inconsistency in transition from one cycle to another. The above issues in OC use could be addressed in a number of ways. Access to adequate information on OC use could be arranged through making available a uniform instruction sheet with each cycle of pills and introducing pictorial instructions for less educated users. Information, education and communication (IEC) activities might be helpful to spread accurate pill-taking information to all potential users. On the other hand, manufacturers could consider the possibility of developing a new pill that can be taken continuously without any breaks. Earlier research has also documented that providers may contribute to the problem by giving inaccurate instructions for regular use, and what to do with missed pills (Potter *et al.*, 1988). Regular in-service training could help providers to be well equipped with updated pill-taking information, as well as enough motivation to help women in their effective pill use.

The present study helps quantify the levels of incorrect pill use in rural Bangladesh along with their predictors, and suggests that women need more support in their pill use. Service providers should help women to establish a regular routine for taking their pills, ensure that they properly understand the instructions, including those concerning when pills are missed, know about what method should be used if pills do not work out, and where to get additional information or assistance if required. Husbands should provide moral and instrumental support to their wives in their pill use. There is also a need for reallocation of resources for education, particularly for women. Finally, a considerable amount of motivation is essential to make the newly established community clinics more accessible to all who require them. This study argues that these efforts may result in increased OC compliance in rural Bangladesh.

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