



Published in final edited form as:

Stud Fam Plann. 2008 September ; 39(3): 177–186.

Domestic Violence, Contraceptive Use, and Unwanted Pregnancy in Rural India

Rob Stephenson,

Assistant Professor, Hubert Department of Global Health, Rollins School of Public Health, Emory University, 1518 Clifton Road, NE, Atlanta, GA, 30322. E-mail: rbsteph@sph.emory.edu

Michael A. Koenig,

Professor, Department of Population, Family and Reproductive Health, Bloomberg School of Public Health, The Johns Hopkins University, Baltimore, MD

Rajib Acharya, and

Senior Programme Officer, Population Council, New Delhi

Tarun K. Roy

Former Director, International Institute for Population Sciences, Mumbai

Abstract

This study examines the relationship between male-to-female physical domestic violence and unwanted pregnancy among women in three economically and culturally diverse areas of India. A central methodological focus of the study is the examination of retrospective and prospective measures of pregnancy unwantedness, contrasting their usefulness for specifying levels of unwanted pregnancy and its relationship with domestic violence. Data from India's 1998–99 National Family Health Survey and a 2002–03 follow-up survey for which women in four states were reinterviewed are analyzed, and the factors associated with the intersurvey adoption of contraception and the experience of an unwanted pregnancy are examined. Women who experience physical violence from their husbands are significantly less likely to adopt contraception and more likely to experience an unwanted pregnancy. A prospectively measured indicator of unwanted pregnancy identifies a higher prevalence of unwanted pregnancies than do the traditionally employed retrospective measures and is more successful in establishing a relationship between unwanted pregnancies and domestic violence. The results demonstrate a clear relationship between a woman's experience of physical violence from her husband and her ability to achieve her fertility intentions. The need to improve the measurement of pregnancy intendedness is clear, and a move toward using prospective measures as the standard is necessary.

Substantial evidence points to high levels of domestic violence in South Asia (Jejeebhoy and Cook 1997; Martin et al. 1999; Koenig et al. 2003; Bates et al. 2004; Garcia-Moreno et al. 2006; Naved et al. 2006; Jeyaseelan et al. 2007; Silverman et al. 2007). Although female-to-male partner violence occurs in these settings, the overwhelming form of domestic violence is perpetrated by men against women. Recognition of the prevalence of domestic violence in India is growing; high levels of violence have been reported in both rural and urban areas (Rao 1997; Jejeebhoy 1998; Purwar et al. 1999; Jeyaseelan et al. 2004; Peedicayil et al. 2004; Salam et al. 2006; Jeyaseelan et al. 2007). A range of frequent, serious, adverse health outcomes associated with domestic violence that affect women and their children have been documented globally (Heise et al. 1994; Krug et al. 2002; Campbell et al. 1995; Ahmed et al. 2006; Stephenson et al. 2006a and 2006b). Evidence has revealed an association between domestic

violence and low birth weight and prematurity (Bullock and McFarlane 1989; Valdez-Santiago and Sanín-Aguirre 1996; Campbell and Soeken 1999; Cokkinides et. al. 1999; Fernandez and Krueger 1999; Murphy et al. 2001), elevated risks of perinatal and early childhood mortality (Jejeebhoy 1998; Ahmed et al. 2006), gynecological morbidity (Schei 1991; Stephenson et al. 2006b), and sexually transmitted infections including HIV/AIDS (Quigley et al. 2000; Dunkle et al. 2004).

Domestic violence has also been linked to an increased risk of unwanted pregnancy, primarily through its restrictive effect upon women's ability to practice contraception (Ezeh 1993; Bawah et al. 1999; Krug et al. 2002). Much of the evidence for the association between violence and unwanted pregnancy comes from studies conducted in developed countries; few studies have examined this relationship in South Asia. This study explores the relationship between male-to-female physical domestic violence and unwanted pregnancy among women in three economically and culturally diverse areas of India. A methodological focus of this study is the examination of retrospective and prospective measures of pregnancy unwantedness, contrasting their usefulness for identifying relationships between violence and unwanted pregnancy. The findings are discussed in terms of their implications for current family planning service delivery and the collection of data pertaining to pregnancy unwantedness.

Measuring Unwanted Pregnancy

The measurement of unintended pregnancy is complicated by a number of serious methodological challenges (Bongaarts 1990; Brown and Eisenberg 1995; Santelli et al. 2003; Gipson et al. 2008). Foremost among these is the issue of postbirth rationalization, whereby respondents may be unwilling to describe retrospectively as unwanted those births that were unwanted at the time of conception and instead categorize them as either wanted or mistimed. Substantial evidence of postbirth rationalization has been found in developing countries (Westoff and Ryder 1977; Miller 1994; Bankole and Westoff 1998; Kaestner 1999; Poole et al. 2000; Joyce et al. 2002; Speizer et al. 2004). Two studies reporting data from developing countries found the same pronounced tendency to rationalize unwanted births subsequently as either wanted or mistimed (Bankole and Westoff 1998; Koenig et al. 2006a). This issue takes on added significance because in almost all major surveys, unwanted childbearing continues to be measured retrospectively. Standardization is lacking in the wording of commonly used retrospective measures of pregnancy wantedness; some questionnaires ask about the wantedness of pregnancies, others about the intendedness of pregnancies. Prior research findings suggest substantial variation in the understanding of unplanned versus unintended pregnancies (Kaufmann et al. 1997; Klerman and Pulley 1999; Stanford et al. 2000; Barrett and Wellings 2002; Barrett et al. 2004), resulting in incomparable indicators that measure subtly different aspects of attitudes toward pregnancy. Other studies have examined maternal happiness ratings as indicators of pregnancy wantedness and have found inconsistencies with measures of wantedness or intendedness (Sable and Libbus 2000; Pulley et al. 2002). In this study, we compare retrospectively and prospectively recorded measures of pregnancy unwantedness and examine the relationship between physical domestic violence and each of these measures of unwanted pregnancy.

Domestic Violence, Unintended Pregnancy, and Contraceptive Behavior

Evidence of the impact of domestic violence on pregnancy and contraceptive use comes largely from studies conducted in the United States. Both physical and sexual domestic violence have been shown to be significantly associated with an increased risk of mistimed or unwanted pregnancy (Stewart and Cecutti 1993; Campbell et al. 1995; Gazmararian et al. 1995; McFarlane et al. 1996; Cokkinides et al. 1999; Jacoby et al. 1999; Martin et al. 1999; Saltzman et al. 2003; D'Angelo et al. 2004; Pallitto and O'Campo 2004 and 2005) and short intervals between pregnancies (Stewart and Cecutti 1993; Gazmararian et al. 1995). Studies also have

found evidence of a relationship between domestic violence and increased use of abortion (Amaro et al. 1990). Few studies of the relationship between domestic violence and pregnancy unwantedness are available for the South Asian region. Studies conducted in India (Purwar et al. 1999) and Bangladesh (Silverman et al. 2007) demonstrate that women who experience violence are two times more likely than those who do not to report that their last pregnancy was unwanted.¹

A primary explanation for the influence of domestic violence on the risk of unwanted pregnancy is the possible constraining effect of such violence upon women's ability to negotiate or practice contraception effectively with their partners. Several United States-based studies have reported the occurrence of domestic violence to be negatively associated with the likelihood of modern contraceptive use (Eby et al. 1995; Kalichman et al. 1998; Wingood and DiClemente 1998). Quantitative evidence from India about the possible role of domestic violence in constraining women's use of contraceptives remains limited, however. Our previous work has found lower odds of contraceptive adoption among Indian women who have experienced physical domestic violence from their husbands (Stephenson et al. 2006a). In contrast, an earlier cross-sectional study of husbands in North India failed to find a consistently significant association between their reports of spousal abuse and reports of current contraceptive use (Martin et al. 1999). Not all studies infer that the direction of causality flows from domestic violence to contraceptive behavior. In a contrasting interpretation, a cross-sectional study from South India reported a positive association between domestic violence and wives' having been sterilized, which the authors suggested was a result of husbands' increased fears concerning their wives' fidelity following sterilization (Rao 1997).

Results from qualitative studies on the link between domestic violence and contraceptive use in developing countries demonstrate how the potential for violence is often a deterrent to contraceptive use. In studies conducted in India (Khan et al. 1996) and Ghana (Bawah et al. 1999), women report that they lack control over reproductive decisions and that the threat of physical violence leads to their nonuse of contraceptives and unwanted pregnancies. Other studies have shown that the use of contraceptives may, itself, lead to violence; a study conducted in Uganda (Kaye 2006) shows that men often believe that a woman's clandestine use of contraceptives is a justifiable reason for beating her. Another study found that young South African women who attended family planning clinics often faced physical violence from their partners (Wood and Jewkes 1997).

Limitations common to most previous studies of the effects of domestic violence on unwanted pregnancy and contraceptive behavior in developing countries have been their cross-sectional nature and their reliance on retrospective measures of pregnancy wantedness. In the present study, we contrast retrospective and prospective approaches to measuring pregnancy unwantedness and explore in greater depth the possible relationship between domestic violence, subsequent contraceptive adoption, and unwanted pregnancy in a setting characterized by high levels of domestic violence and low contraceptive prevalence.

The Study Setting

The analysis presented here, based on the 1998–99 National Family Health Survey and a 2002–03 follow-up survey, examines women in rural areas of four economically and culturally diverse states: Bihar, Jharkhand, Maharashtra, and Tamil Nadu. The four states vary widely across a range of indicators related to socioeconomic and women's status, with a principal demarcation between the North Indian states of Bihar and Jharkhand (formerly one state) and the states of Maharashtra and Tamil Nadu, situated in western and South India, respectively.

¹Note: Both of these studies were cross-sectional and relied on retrospective reporting of pregnancy wantedness.

On all indicators of women's status—age at marriage, exposure to the mass media, literacy, and ability to avail themselves of child health services—women in Bihar and Jharkhand fare considerably worse relative to women in Maharashtra and Tamil Nadu (see Table 1). These data demonstrate the marked developmental, social, and cultural divide that distinguishes the North Indian region from the southern and western regions (Dyson and Moore 1983). The principal difference between the states is the unique kinship structure of North India, which ascribes little autonomy to females (Dyson and Moore 1983; Griffiths et al. 2001). Under these conditions, physical abuse and punishment of women is a common feature of North Indian society. Previous studies have suggested that levels of domestic violence are so high in North India that it is a normative and tolerated element of society (Koenig et al. 2006b). Although lower levels of violence are reported in South India, previous studies have identified levels of violence there that also are high by international comparisons (Rao 1997).

Data and Methods

Two data sets are used for this analysis. The National Family Health Survey-2 (NFHS-2)—the Indian equivalent of the Demographic and Health Survey—was India's second national survey, carried out in 1998–99. The NFHS-2 sample covered 99 percent of India's population residing in its 26 states and ultimately included a total of 89,199 reproductive-aged (15–49 years) women residing in 91,196 households (IIPS and ORC Macro 2000). The NFHS-2 included three questionnaires: a household questionnaire that collected basic sociodemographic information about all usual residents of the household; a village questionnaire that collected information on the availability of specific facilities, programs, and services in the village; and a women's questionnaire that collected information concerning the following: sociodemographic characteristics; fertility behavior and intentions; use, knowledge, and quality of family planning methods; maternal and child health care; reproductive health; and domestic violence. Overall response rates for sampled women were high (96 percent), and ranged from 94 to 100 percent in the states included in the present study (IIPS and ORC Macro 2000).

Following completion of the NFHS-2 survey, a prospective follow-up study of original NFHS-2 respondents was planned by the International Institute for Population Sciences (IIPS) in Mumbai and the Johns Hopkins Bloomberg School of Public Health in Baltimore. The follow-up study was motivated by a number of research interests, including (a) the relationship between family planning service quality and subsequent contraceptive use and (b) the predictive validity of stated fertility intentions (IIPS and Johns Hopkins University 2005). The sampling frame for the NFHS-2 follow-up survey, conducted in 2002–03, consisted of all rural respondents interviewed in the original 1998–99 study in four Indian states: Bihar and Jharkhand (which had been part of Bihar at the time of the NFHS-2 survey) in the North, Maharashtra in the West, and Tamil Nadu in the South. These four states were chosen to represent different demographic, socioeconomic, and service-program contexts in India. The follow-up survey aimed to examine associations between contraceptive use and service quality. Thus, the sample was restricted to rural NFHS-2 respondents because of the expectation that gaining complete information on family planning services in rural areas would be easier than gathering it in urban areas in light of the diverse and complex nature of family planning service-delivery points in urban India. The sample was further restricted to currently married women who were usual residents of the household at the time of the 1998–99 NFHS-2 interviews, given the study's focus on subsequent fertility and contraceptive behavior. The survey instrument included questions pertaining to respondents' background characteristics, reproductive behavior and intentions, quality of family planning care, use of family planning methods and services, an event calendar covering the intervening months between the baseline (NFHS-2) and follow-up survey (to assess intervening pregnancies, pregnancy outcomes, and monthly contraceptive-use status), antenatal care and immunization, women's status,

premarital pregnancy planning, and domestic violence. High rates of reinterview were achieved in all four states, ranging from 76 percent in Maharashtra to 94 percent in Tamil Nadu. As documented elsewhere (IIPS and Johns Hopkins University 2005), with the exception of lower levels of baseline contraceptive use and prevalence of domestic violence in Bihar and Tamil Nadu, the reinterviewed and nonreinterviewed samples of women were generally similar in characteristics, indicating no significant selectivity in our reinterviewed sample.

Measures of Domestic Violence

Questions related to domestic violence were included in both the 1998–99 NFHS-2 and the 2002–03 NFHS-2 follow-up surveys. Because the outcomes modeled (contraceptive use and unwanted pregnancy) are measured at the follow-up survey, however, a measure of violence that we know preceded the outcome must be used. Thus, our violence-exposure measure is taken from the NFHS-2 survey. Respondents were asked whether they had been physically mistreated by anyone since the age of 15, who perpetrated the violence, and how frequently they had experienced violence in the 12 months prior to the survey. From the responses to these questions, we calculate a variable coded 1 if the respondent reported experiencing physical violence from her husband in the 12 months prior to the baseline survey.

Measures of Contraceptive Use and Unwanted Pregnancy

The analysis considers a prospectively observed measure of unwanted pregnancy. In the 1998–99 NFHS-2, women were asked when they wanted to have their next child (as soon as possible, within two years, after two years, or did not want more children). In the 2002–03 follow-up survey, women were asked whether they had given birth in the four-year intersurvey period. Women who reported in the NFHS-2 that they wanted no more children and reported having given birth in the follow-up survey are categorized as having experienced an unwanted pregnancy. For women who reported at baseline that they did not want more children, all subsequent births are assumed to be unwanted. For these women, therefore, the prospective measure categorizes all intersurvey births as unwanted.

The study of unwanted pregnancies usually has relied on the use of retrospectively measured indicators of unwantedness, which have the potential to be biased as a result of postbirth rationalization of pregnancies (Westoff and Ryder 1977; Miller 1994; Bankole and Westoff 1998; Kaestner 1999; Poole et al. 2000; Joyce et al. 2002; Speizer et al. 2004; Gipson et al. 2008). To examine the advantages of the prospectively measured indicator of unwantedness used here, we also examine the relationship between unwanted pregnancy and two retrospectively measured indicators of unwantedness. For the first retrospective measure, women were asked in the 2002–03 follow-up survey about the wantedness status of all births in the intersurvey period. The question was worded as follows: “At the time you became pregnant with [name], did you want to become pregnant then, did you want to wait until later, or did you not want to become pregnant at all?” Women who reported that they did not want to become pregnant in the intersurvey period but had done so are categorized as having experienced an unwanted pregnancy. For the second retrospective measure, women were asked in the follow-up survey to think of the pregnancies they experienced in the intersurvey period and rate their feelings about each pregnancy on a scale of one to ten (ten being very happy and one being very unhappy). The question was worded as follows: “Thinking back to the time you became pregnant with [name], how did you feel about the pregnancy?” (The respondents were then shown a scale with a happy face at ten and a sad face at one.) A score of five on the scale represents neutral feelings about the pregnancy. To avoid the possibility that a score of four might also represent neutral feelings, the authors decided to categorize scores of three or less for any intersurvey pregnancy as representing unhappiness with the pregnancy. Women were asked in both the NFHS-2 and the follow-up survey whether they were currently using a method of contraception and which method they were using.

Analysis

The data set for this analysis is comprised of linked data from the NFHS-2 and the NFHS-2 follow-up surveys for rural married women of reproductive age having at least one child who reported not using a method of contraception in response to the NFHS-2 survey, producing a sample of 3,234 women. Women without children are excluded from the analysis because the probabilities that such women in this cultural setting will adopt contraception or report that they do not want to have a child are extremely low. Women who reported in the NFHS-2 that they have undergone sterilization are excluded to allow examination of how domestic violence influences subsequent contraceptive use and to limit the sample to women who are at risk of pregnancy. A comparison of the characteristics of the analysis sample of women who use contraceptives with those who do not (who were excluded from the study) shows that users are slightly older and have a lower mean age at marriage than nonusers. The main difference between the two groups is in educational attainment; those who use a method are more likely to have attended school. T-tests show that the two samples did not differ significantly in terms of the reporting of domestic violence (not shown).

The analysis considers two sets of outcomes. The first is a binary variable coded 1 if the woman reports adopting any modern method of contraception (female or male sterilization, the pill, the IUD, an injectable, condoms, or an implant) in the intersurvey period. In light of the dominance of female sterilization among methods used in India, examining separately the association between violence and temporary and permanent methods of contraception is not possible. For the analysis of unwanted pregnancy, three outcomes are considered: one prospective and two retrospective measures of unwanted pregnancy. Each is a binary variable coded 1 if the respondent experienced an unwanted pregnancy in the intersurvey period. For analysis of the two retrospective measures, nonlive births ($n = 166$) are removed from the analysis sample; women were not asked the retrospective questions on wantedness for these pregnancies. The resulting sample consists of 3,734 intersurvey births. Separate logistic models are fitted for each of the outcomes. The key covariate of interest in each of the models is whether the respondent reported experiencing physical domestic violence from her husband in the 12 months prior to the NFHS-2 survey. The models also control for parity, presence of a living son, level of education (of both respondent and husband), decisionmaking power, household assets, and state of residence. Decisionmaking power is measured on a scale of zero to four, based on whether the respondent reports sole decisionmaking concerning what to cook and whether to buy jewelry, seek health care, and visit and stay with family. Household assets are measured by the ownership of nine goods (fan, telephone, bicycle, refrigerator, vehicle, washing machine, television, radio, and motorcycle); asset ownership is categorized as low, medium, and high.

Results

In their responses to the NFHS-2, a large proportion women reported a desire either to delay or to stop childbearing; 44 percent wanted no more children (see Table 2). A total of 3,900 live births occurred in the intersurvey period; 21 percent of the women had more than one birth. Using the prospective measure of unwantedness, approximately one-fourth (23 percent) of births in the intersurvey period were unwanted. Lower prevalences of unwanted pregnancies were identified using the retrospective measures of intendedness: based on the reporting of the wantedness status of pregnancies in the intersurvey period, 11 percent of births were unwanted; based on feelings toward pregnancies in the intersurvey period, 5 percent were unwanted (not shown). Figure 1 shows the distribution of retrospective responses of unwantedness among the prospectively measured unwanted births. Evidence of postbirth rationalization is clear: among those who experienced a prospectively measured unwanted birth, 56 percent retrospectively

reported that they wanted the birth and 63 percent retrospectively reported that they were happy to be pregnant.

Twenty-seven percent of the women reported adopting a method of contraception in the intersurvey period; 80 percent of these women underwent sterilization (not shown). In contrast, 34 percent of women surveyed for the NFHS-2 reported that they were currently using a method of contraception, of whom 85 percent had undergone sterilization. One-fifth of women reported at baseline that they had experienced physical domestic violence from their husbands in the 12 months prior to the survey.

Table 3 shows the results of the modeling of contraceptive adoption in the intersurvey period. Women who reported experiencing physical domestic violence were significantly less likely to adopt a contraceptive method. The adoption of contraception was largely driven by education and the presence of a living son. Husband's education showed a significant positive influence on the adoption of a method. Women surveyed in Maharashtra and Tamil Nadu were more likely than women in Bihar to adopt contraception.

Table 4 shows the results of the modeling of experiencing unwanted pregnancies. Women who experienced physical domestic violence from their husbands had significantly greater odds of experiencing an unwanted pregnancy during the intersurvey period. Women with higher degrees of decisionmaking power were less likely to report an unwanted pregnancy than were those with less power. Parity and women's educational attainment were significantly associated with the reporting of unwanted pregnancy. Women who had a living son were almost three times more likely than those who did not to report an unwanted pregnancy. Women who reported in the NFHS-2 that they had previously used a temporary method of contraception had significantly greater odds than those who had not used one of reporting an unwanted pregnancy. Relative to women in Bihar, women in Tamil Nadu were more likely to report an unwanted pregnancy. Based upon the two retrospective measures of intendedness (see Table 5), no significant association was found between experiencing violence and reporting an unwanted pregnancy.

Discussion

The results demonstrate a clear relationship between a woman's experience of physical violence perpetrated by her husband and her ability to achieve her fertility intentions. Women in the sample indicated a strong desire to limit births; substantial numbers of women reported a preference to cease childbearing, coupled with relatively low levels of contraceptive adoption in the intersurvey period. Women who experienced physical violence were less likely to practice contraception and were more likely to experience an unwanted birth, demonstrating the significant reproductive health burden created by an environment of domestic violence. Because the influence of physical domestic violence on contraceptive adoption and unwanted pregnancy persists even after controlling for the range of socioeconomic and demographic factors commonly found to influence contraceptive behavior and pregnancy intentions, these relationships are unlikely to be the product of other confounding factors.

The finding of a restrictive effect of physical violence on contraceptive adoption mirrors similar findings from a study in the North Indian state of Uttar Pradesh (Stephenson et al. 2006a). As noted above, the dominant contraceptive method used in India is female sterilization, which accounts for approximately 85 percent of all method use (IIPS and ORC Macro 2000). The adoption of female sterilization requires the permission and active cooperation of the husband, hence the limiting effect of violence on the adoption of a permanent contraceptive method may reflect conservative gender attitudes among husbands prone to violence. Domestic violence

that originates from a husband's desire to enforce perceived gender roles or to ensure that his wife meets preconceived fertility responsibilities may limit a woman's access to sterilization.

Using a prospective measure of pregnancy intendedness shows that the experience of domestic violence increases the likelihood that a woman will experience an unwanted pregnancy. This finding likely reflects the relationship between violence and contraceptive use; because the primary form of contraception in India is female sterilization, which is adopted to end childbearing, women who wish to have no more children and who are prevented from undergoing sterilization are likely to experience one or more unwanted pregnancies. Women who experience violence from their husbands are also less likely to have control over sexual activity or to be able to make decisions about the timing of childbearing, particularly in such a highly gender-stratified setting. Women who reported greater decisionmaking power in their marital relationship were less likely to experience unwanted pregnancy, a finding that demonstrates the importance of female autonomy and the role that greater gender equity plays in shaping a woman's ability to manage her fertility intentions. Therefore, in relationships in which the woman suffers violence from her husband, an unwanted pregnancy is likely to be a product of the combination of her restricted access to contraception and her lack of control over sexual and reproductive health decisionmaking.

The results of this study demonstrate the methodological advantages of using a prospective measure of pregnancy intendedness. Substantial differences in the prevalence of unwanted pregnancies were found between the retrospective and prospective measures, exposing the underreporting and misclassification of pregnancy intentions that occur with retrospective reporting (Koenig et al. 2006a). Only when a prospective measure of pregnancy intendedness was used could the relationship between violence and unwanted pregnancy be found, indicating that the misreporting of pregnancy intendedness associated with retrospective measures has serious implications for understanding the determinants of unwanted fertility. Also, the use of a retrospective measure of intendedness makes disentangling the temporal ordering of events difficult. In this study, the baseline data contain information about violence perpetrated in the 12 months prior to the survey and about the intendedness of the last birth. If information about the exact timing of violence is lacking, the potential exists for misclassification of pre- and postpregnancy violence. The use of a prospective measure of violence not only removes the potential for postbirth rationalization that leads to the misreporting of pregnancy intendedness, but also allows the temporal relationship between violence and unwanted pregnancies to be determined.

The main potential limitation of this study is the possible underreporting of domestic violence. One-fifth of women in the study sample reported experiencing physical violence perpetrated by their husbands, a level comparable to that found in other studies conducted in South Asia (previous studies have shown the proportion of women or men reporting male-to-female violence in this region to be 17–46 percent) (Jejeebhoy and Cook 1997; Martin et al. 1999; Koenig et al. 2003). Prior research suggests that widespread acceptance of male-to-female violence exists in this setting (Jejeebhoy 1998; Koenig et al. 2006b), likely reducing the stigma attached to domestic violence and the social desirability bias that would lead to its underreporting. A limitation of the prospective measure of pregnancy unwantedness is that the attitudes of women who may change their minds about a pregnancy's desirability cannot be captured. If a woman reported not wanting an additional child, all children she bears in the intersurvey period are assumed to be unwanted; experiencing an unwanted pregnancy may, in fact, alter a woman's desire for more children. Retrospective questions about wantedness were not asked of women who had experienced stillbirths in the intersurvey period because women are unlikely to report such births as unwanted. Stillbirths may be linked to the experience of violence during pregnancy; an advantage of the prospective measure is that it removes the potential bias of the omission of nonlive births in the measurement of unwantedness. Moreover,

these findings are based on a sample of rural residents; the relationship between violence and unwanted pregnancy may differ in urban areas, where access to family planning services and opportunities for women outside the home are potentially greater.

Conclusion

The present study contributes toward a better understanding of how experiencing physical domestic violence restricts a woman's ability to achieve her reproductive intentions. Two recommendations emerge from these results. From a methodological perspective, the prospective measurement of pregnancy intendedness has facilitated both a more accurate measurement and correct temporal ordering of the relationship between violence and unwanted pregnancy. A clear need exists to improve the measurement of pregnancy intendedness, to move toward prospective measures as the standard, and to conduct in-depth research to understand how women interpret retrospective questions on wantedness.

Second, the results point to the need for domestic violence services to be incorporated into family planning service delivery, especially in gender-stratified settings such as India. Barriers to contraceptive-method access that may also precipitate domestic violence, such as the need for a woman to gain her husband's permission to be sterilized, must be examined as potential interventions for reducing such violence. The experience of violence clearly can lead to unwanted fertility in a society such as that of India, where violence is widespread. Reductions in violence and a resultant adoption of contraception have the potential to further decrease levels of unwanted fertility.

Acknowledgments

This research was funded by the National Institute of Child Health and Human Development.

References

- Ahmed, Saifuddin; Koenig, Michael A.; Stephenson, Rob. Effects of domestic violence on perinatal and early-childhood mortality: Evidence from North India. *American Journal of Public Health* 2006;96(8):1,423–1,428.
- Amaro, Hortensia; Fried, Lise E.; Cabral, Howard; Zuckerman, Barry. Violence during pregnancy and substance use. *American Journal of Public Health* 1990;80(5):575–579. [PubMed: 2327535]
- Bankole, Akinrinola; Westoff, Charles F. The consistency and validity of reproductive attitude: Evidence from Morocco. *Journal of Biosocial Science* 1998;39(4):439–455. [PubMed: 9818553]
- Barrett, Geraldine; Wellings, Kaye. What is a 'planned' pregnancy? Empirical data from a British study. *Social Science & Medicine* 2002;55(4):545–557. [PubMed: 12188462]
- Barrett G, Smith SC, Wellings K. Conceptualisation, development, and evaluation of a measure of unplanned pregnancy. *Journal of Epidemiology and Community Health* 2004;58(5):426–433. [PubMed: 15082745]
- Bates, Lisa M.; Schuler, Sidney Ruth; Islam, Farzana; Islam, Md Kairul. Socioeconomic factors and processes associated with domestic violence in rural Bangladesh. *International Family Planning Perspectives* 2004;30(4):190–199. [PubMed: 15590385]
- Bawah, Ayaga Agula; Patricia, Akweongo; Simmons, Ruth; Phillips, James F. Women's fears and men's anxieties: The impact of family planning on gender relations in northern Ghana. *Studies in Family Planning* 1999;30(1):54–66. [PubMed: 10216896]
- Bongaarts, John. The measurement of wanted fertility. *Population and Development Review* 1990;16(3):487–506.
- Brown, Sarah S.; Eisenberg, Leon, editors. *The Best Intentions: Unintended Pregnancy and the Well-being of Children and Families*. Washington, DC: National Academy Press; 1995.
- Bullock, Linda F.; McFarlane, Judith. The birth weight/battering connection. *American Journal of Nursing* 1989;89(9):1,153–1,155.

- Campbell, Jacquelyn C.; Soeken, Karen L. Forced sex and intimate partner violence: Effects on women's risk and women's health. *Violence Against Women* 1999;5(9):1,017–1,035.
- Campbell, Jacquelyn C.; Pugh, Linda C.; Campbell, Doris; Visscher, Marie. The influence of abuse on pregnancy intention. *Women's Health Issues* 1995;5(4):214–223. [PubMed: 8574118]
- Cokkinides, Vilma E.; Coker, Ann L.; Sanderson, Maureen; Addy, Cheryl; Bethea, Lesa. Physical violence during pregnancy: Maternal complications and birth outcomes. *Obstetrics & Gynecology* 1999;93(5):661–666. [PubMed: 10912963]
- D'Angelo, Denise V.; Gilbert, Brenda Colley; Rochat, Roger W.; Santelli, John S.; Herold, Joan M. Differences between mistimed and unwanted pregnancies among women who have live births. *Perspectives on Sexual and Reproductive Health* 2004;36(5):192–197. [PubMed: 15519961]
- Dunkle, Kristin L.; Jewkes, Rachel K.; Brown, Heather C.; Gray, Glenda E.; McIntryre, James A.; Harlow, Siobán D. Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *The Lancet* 2004;363(9419):1,415–1,421.
- Dyson, Tim; Moore, Mick. On kinship structure, female autonomy, and demographic behavior in India. *Population and Development Review* 1983;9(1):35–60.
- Eby, Kim; Campbell, Jacquelyn C.; Sullivan, Chris; Davidson, William. Health effects of experiences of sexual violence for women with abusive partners. *Health Care for Women International* 1995;16(6):563–576. [PubMed: 8707690]
- Ezeh, Alex C. The influence of spouses over each other's contraceptive attitudes in Ghana. *Studies in Family Planning* 1993;24(3):163–174. [PubMed: 8351697]
- Fernandez FM, Krueger PM. Domestic violence: Effect on pregnancy outcome. *Journal of the American Osteopath Association* 1999;99(5):254–256.
- Garcia-Moreno, Claudia; Jansen, Henrica AFM.; Ellsberg, Mary; Heise, Lori; Watts, Charlotte H. Prevalence of intimate partner violence: Findings from the WHO multi-country study on women's health and domestic violence. *The Lancet* 2006;368(9543):1,260–1,269.
- Gazmararian, Julie A.; Adams, Melissa M.; Saltzman, Linda E.; Johnson, Christopher H.; Bruce, F Carol; Marks, James S.; Zahniser, S Christine. The relationship between pregnancy intendedness and physical violence in mothers of newborns. *Obstetrics & Gynecology* 1995;85(6):1,031–1,037. [PubMed: 7800303]
- Gipson, Jessica D.; Koenig, Michael A.; Hindin, Michelle J. The effects of unintended pregnancy on infant, child, and parental health: A review of the literature. *Studies in Family Planning* 2008;39(1):18–38. [PubMed: 18540521]
- Griffiths, Paula; Hinde, Andrew; Matthews, Zoë. Infant and child mortality in three culturally contrasting states of India. *Journal of Biosocial Science* 2001;33(4):603–622. [PubMed: 11683227]
- Heise, Lori L.; Raikes, Alanagh; Watts, Charlotte H.; Zwi, Anthony B. Violence against women: A neglected public health issue in less developed countries. *Social Science & Medicine* 1994;39(9):1,165–1,179. [PubMed: 8066480]
- International Institute for Population Sciences (IIPS) and Johns Hopkins University. Final Report of the 2003 NFHS-2 Four-state Follow-up Survey. Mumbai: IIPS; 2005.
- International Institute for Population Sciences (IIPS) and ORC Macro. National Family Health Survey (NFHS-2), 1998–99: India. Mumbai: IIPS; 2000.
- Jacoby, Mark; Gorenflo, Daniel; Black, Erin; Wunderlich, Christine; Eyler, A Evan. Rapid repeat pregnancy and experiences of interpersonal violence among low-income adolescents. *American Journal of Preventative Medicine* 1999;16(4):318–321.
- Jejeebhoy, Shireen J. Associations between wife-beating and fetal and infant death: Impressions from a survey in rural India. *Studies in Family Planning* 1998;29(3):300–308. [PubMed: 9789323]
- Jejeebhoy, Shireen J.; Cook, Rachel J. State accountability for wife-beating: The Indian challenge. *The Lancet* 1997;349(S1):S10–S12.
- Jeyaseelan, Lakshman; Kumar, Shuba; Neelakantan, Nithya; Peedicayil, Abraham; Pillai, Rajamohanam; Duvvury, Nata. Physical spousal violence against women in India: Some risk factors. *Journal of Biosocial Science* 2007;39(5):657–670. [PubMed: 17349066]
- Jeyaseelan, Lakshman; Sadowski, Laura; Kumar, Shuba; Hassan, Fatma; Ramiro, Laurie; Vizcarra, Beatriz. World studies of abuse in the family environment—Risk factors for physical intimate partner violence. *Injury Control and Safety Promotion* 2004;11(2):117–124. [PubMed: 15370348]

- Joyce, Theodore J.; Kaestner, Robert; Korenman, Sanders. On the validity of retrospective assessments of pregnancy intention. *Demography* 2002;39(1):199–213. [PubMed: 11852837]
- Kaestner, Robert. Other consequences of unintended pregnancies. Paper presented at the National Institute of Child Health and Human Development Conference on the Determinants of Unintended Pregnancy in the US; Bethesda, MD. 11–12 March; 1999.
- Kalichman SC, Williams EA, Cherry C, Blecher L, Dachimson D. Sexual coercion, domestic violence and negotiating condom use among low-income African-American women. *Journal of Women's Health* 1998;7(3):371–378.
- Kaufmann, Rachel B.; Morris, Leo; Spitz, Alison M. Comparison of two question sequences for assessing pregnancy intentions. *American Journal of Epidemiology* 1997;145(9):810–816. [PubMed: 9143211]
- Kaye, Dan K. Community perceptions and experiences of domestic violence and induced abortion in Wakiso District, Uganda. *Qualitative Health Research* 2006;16(8):1,120–1,128.
- Khan ME, Townsend John W, Sinha Ranjana, Lakhanpal Seema. Sexual violence within marriage. *Seminar* 1996;447:32–35.
- Klerman, LV.; Pulley, LV. Report prepared for the staff of the National Survey of Family Growth. Hyattsville, MD: National Center for Health Statistics; 1999. Approaches to studying the intendedness of pregnancy in Cycle 6 of the National Survey of Family Growth.
- Koenig, Michael A.; Acharya, Rajib; Singh, Sagri; Roy, Tarun K. Do current measurement approaches underestimate levels of unwanted childbearing? Evidence from rural India. *Population Studies* 2006a; 60(3):243–256. [PubMed: 17060052]
- Koenig, Michael A.; Ahmed, Saifuddin; Hossain, Mian Bazle; Khorshed Alam Mozumde, ABM. Women's status and domestic violence in rural Bangladesh: Individual- and community-level effects. *Demography* 2003;40(2):269–288. [PubMed: 12846132]
- Koenig, Michael A.; Stephenson, Rob; Ahmed, Saifuddin; Jejeebhoy, Shireen J.; Campbell, Jacquelyn. Individual and contextual determinants of domestic violence in North India. *American Journal of Public Health* 2006b;96(1):132–138. [PubMed: 16317213]
- Krug, EG.; Dalhberg, LL.; Mercy, JA.; Zwi, AB.; Lozano, R. World Report on Violence and Health. Geneva: World Health Organization; 2002. Sexual violence; p. 149–181.
- Martin, Sandra L.; Kilgallen, Brian; Tsui, Amy Ong, et al. Sexual behaviors and reproductive health outcomes: Associations with wife abuse in India. *Journal of the American Medical Association* 1999;282(20):1,967–1,972.
- McFarlane, Judith; Parker, Barbara; Soeken, Karen. Abuse during pregnancy: Associations with maternal health and infant birth weight. *Nursing Research* 1996;45(1):37–42. [PubMed: 8570420]
- Miller, Warren B. Reproductive decisions: How we make them and how they make us. In: Severy, Lawrence J., editor. *Advances in Population, Volume 2: Psychosocial Perspectives*. London: Jessica Kingsley Publishers; 1994. p. 1–27.
- Murphy, Claire C.; Schei, Berit; Myher, Terri L.; Du Mont, Janice. Abuse: A risk factor for low birth weight? A systematic review and meta analysis. *Canadian Medical Association Journal* 2001;164 (11):1,567–1,572.
- Naved, Ruchira Tabassum; Azim, Safia; Bhuiya, Abbas; Persson, Lars Åke. Physical violence by husbands: Magnitude, disclosure and help-seeking behavior of women in Bangladesh. *Social Science & Medicine* 2006;62(12):2,917–2,929.
- Pallitto, Christina C.; O'Campo, Patricia. The relationship between intimate partner violence and unintended pregnancy: Analysis of a national sample from Colombia. *International Family Planning Perspectives* 2004;30(4):165–173. [PubMed: 15590382]
- Pallitto, Christina C.; O'Campo, Patricia. Community level effects of gender inequality on intimate partner violence and unintended pregnancy in Colombia: Testing the feminist perspective. *Social Science & Medicine* 2005;60(10):2,205–2,216.
- Peedicayil, Abraham; Sadowski, Laura; Jeyaseelan, Lakshman, et al. Spousal physical violence against women during pregnancy. *BJOG: An International Journal of Obstetrics and Gynaecology* 2004;111 (7):682–687. [PubMed: 15198758]

- Poole, Victoria L.; Flowers, Juanzetta S.; Goldenberg, Robert L.; Cliver, Suzanne P.; McNeal, Sandre. Changes in intendedness during pregnancy in a high-risk multiparous population. *Maternal and Child Health Journal* 2000;4(3):179–182. [PubMed: 11097505]
- Pulley, LeaVonne; Klerman, Lorraine V.; Tang, Hao; Baker, Beth A. The extent of pregnancy mistiming and its association with maternal characteristics and behaviors and pregnancy outcomes. *Perspectives on Sexual and Reproductive Health* 2002;34(4):206–211. [PubMed: 12214911]
- Purwar MB, Jeyaseelan L, Varhadpande U, Motghare V, Pim-plakute S. Survey of physical abuse during pregnancy in GMCH, Nagpur, India. *Journal of Obstetrics and Gynecology Research* 1999;25(3):165–171.
- Quigley, Maria A.; Morgan, Dilys; Malamba, Samuel S., et al. Case-control study of risk factors for incident HIV infection in rural Uganda. *Journal of Acquired Immune Deficiency Syndrome* 2000;23(5):418–425.
- Rao, Vijayendra. Wife-beating in rural South India: A qualitative and econometric analysis. *Social Science & Medicine* 1997;44(8):1,169–1,180.
- Sable, Marjorie R.; Libbus, M Kay. Pregnancy intention and pregnancy happiness: Are they different? *Maternal and Child Health Journal* 2000;4(3):191–196. [PubMed: 11097507]
- Salam, Md Abdus; Alim, Md Abdul; Noguchi, Toshikuni. Spousal abuse against women and its consequences on reproductive health: A study in the urban slums in Bangladesh. *Maternal and Child Health Journal* 2006;10(1):83–94. [PubMed: 16362235]
- Saltzman, Linda E.; Johnson, Christopher H.; Gilbert, Brenda Colley; Goodwin, Mary M. Physical abuse around the time of pregnancy: An examination of prevalence and risk factors in 16 states. *Maternal and Child Health Journal* 2003;7(1):31–43. [PubMed: 12710798]
- Santelli, John; Rochat, Roger; Hatfield-Timajchy, Kendra, et al. The measurement and meaning of unintended pregnancy. *Perspectives on Sexual and Reproductive Health* 2003;35(2):94–101. [PubMed: 12729139]
- Schei, Berit. Physically abusive spouse—A risk factor of pelvic inflammatory disease. *Scandinavian Journal of Primary Health Care* 1991;9(1):41–45. [PubMed: 2041928]
- Silverman, Jay G.; Decker, Michele R.; Kapur, Nitin A.; Gupta, Jhumka; Raj, Anita. Violence against wives, sexual risk and sexually transmitted infection among Bangladeshi men. *Sexually Transmitted Infections* 2007;83(3):211–215. [PubMed: 17301104]
- Speizer, Ilene S.; Santelli, John S.; Afafe-Munsuz, Aimee; Kendall, Carl. Measuring factors underlying intendedness of women's first and later pregnancies. *Perspectives on Sexual and Reproductive Health* 2004;36(5):198–205. [PubMed: 15519962]
- Stanford, Joseph B.; Hobbs, Rachel; Jameson, Penny; DeWitt, M Jann; Fischer, Rachel C. Defining dimensions of pregnancy intendedness. *Maternal and Child Health Journal* 2000;4(3):183–189. [PubMed: 11097506]
- Stephenson, Rob; Koenig, Michael A.; Ahmed, Saifuddin. Domestic violence and contraceptive adoption in Uttar Pradesh, India. *Studies in Family Planning* 2006a;37(2):75–86. [PubMed: 16832982]
- Stephenson, Rob; Koenig, Michael A.; Ahmed, Saifuddin. Domestic violence and self-reported gynecological morbidity in North India. *International Family Planning Perspectives* 2006b;32(4):201–212. [PubMed: 17237017]
- Stewart DE, Cecutti A. Physical abuse during pregnancy. *Canadian Medical Association Journal* 1993;149(9):1,257–1,263.
- Valdez-Santiago, Rosario; Sanfín-Aguirre, Luz Helena. Domestic violence during pregnancy and its relationship with birth weight. *Salud Pública de México* 1996;38(5):352–362.
- Westoff, Charles F.; Ryder, Norman B. The predictive validity of reproductive intentions. *Demography* 1977;14(4):431–453. [PubMed: 913730]
- Wingood, Gina M.; DiClemente, Ralph J. Rape among African American women: Sexual, psychological, and social correlates predisposing survivors to risk of STD/HIV. *Journal of Women's Health* 1998;7(1):77–84.
- Wood, Katherine; Jewkes, Rachel. Violence, rape and sexual coercion: Everyday love in South Africa. *Gender and Development* 1997;5(2):23–30. [PubMed: 12292612]

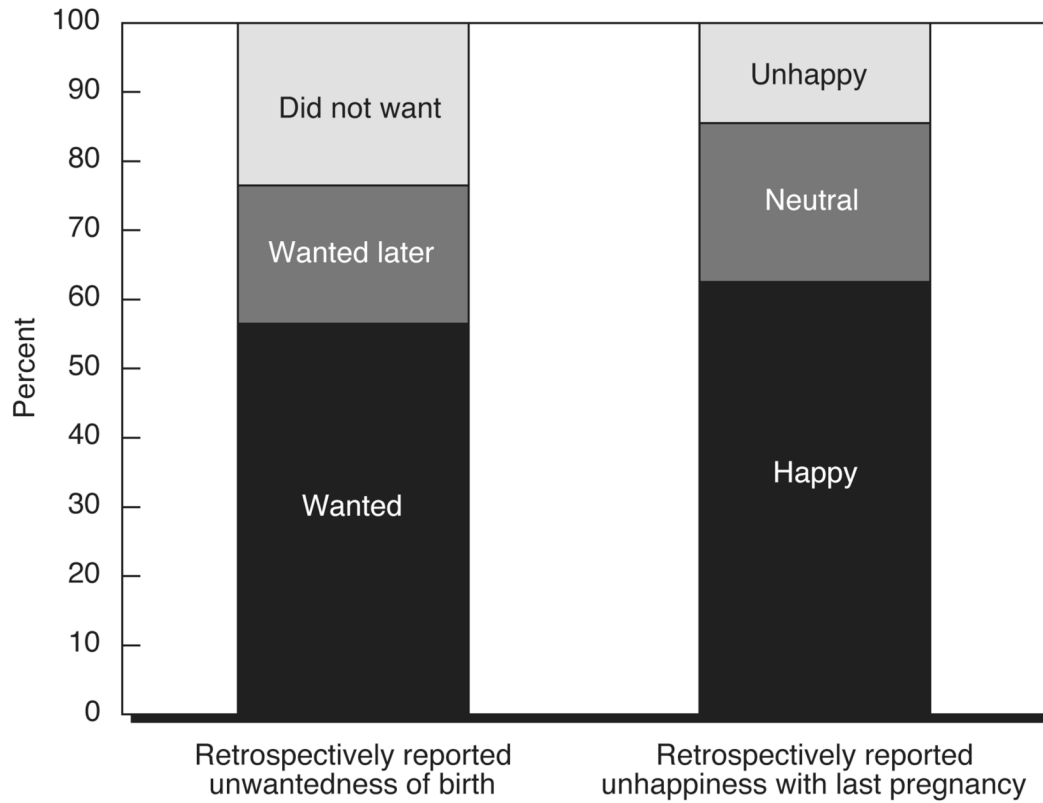


Figure 1. Distribution of retrospective measures of unwantedness among prospectively measured unwanted births (n = 754), rural India

Table 1

Percentage of women of reproductive age surveyed in rural India, by sociocultural characteristics, according to state, 2002–03

Characteristic	Bihar	Jharkhand	Maharashtra	Tamil Nadu
Living children (mean number)	3.4	3.2	2.8	2.4
Age at marriage (mean years)	14.1	14.5	15.9	18.1
Watched television in last week	21.1	31.9	64.5	82.2
Illiterate	75.3	77.7	44.2	39.4
Can take her sick child to the hospital	31.1	16.5	43.7	80.5
Resides in household with electricity	11.4	10.9	73.4	76.3
Currently uses a modern contraceptive method	26.5	29.3	78.7	64.4
Received antenatal care (percent of births)	33.5	41.4	75.6	99.2

Source: International Institute for Population Studies (IIPS) and Johns Hopkins University (2005).

Table 2

Percentages and percentage distributions of dependent and independent variables considered in analysis of contraceptive use and unwanted pregnancies, rural India

Variable	Frequency
Reported not wanting more children at baseline	44.2
Experienced unwanted pregnancy	23.3
Births in the intersurvey period	
0	34.2
1	43.4
2	21.2
3+	0.1
Adopted contraceptive method in the intersurvey period	27.0
Reported experiencing physical violence from husband	20.7
Respondent's level of education	
None	72.9
Primary	10.4
Secondary+	16.7
Parity	
1–2	49.2
3–4	30.1
5+	20.3
Has a living son	75.7
Ever used a temporary method of contraception	12.2
Index of wife's decisionmaking power (scale 1–4)	11.1
Husband's education	
None	40.3
Primary	15.0
Secondary	32.7
High	11.2
Household-asset ownership	
Low	57.6
Medium	34.8
High	7.8
(N)	(3,234)

Table 3

Odds ratios for interim contraceptive adoption among fecund unsterilized women aged 15–45 with at least one living child who are not practicing contraception, rural India

Variable	Odds ratio
Experienced physical violence from husband	
No (r)	1.00
Yes	0.85*
Education	
None (r)	1.00
Primary	1.65*
Secondary+	2.53*
Parity	
1–2 (r)	1.00
3–4	1.09
5+	0.61*
Has a living son	
No (r)	1.00
Yes	1.91*
Index of wife's decisionmaking power	1.02
Husband's education	
None (r)	1.00
Primary	1.73*
Secondary	1.83*
Higher	2.31*
Household-asset ownership	
Low (r)	1.00
Medium	1.09
High	1.16
State of residence	
Bihar (r)	1.00
Jharkhand	1.16
Maharashtra	4.48*
Tamil Nadu	3.80*
(N)	(3,234)

* Significant at $p \leq 0.05$.

Table 4

Odds ratios for occurrence of unwanted pregnancy among fecund unsterilized women aged 15–45 with at least one living child who are not practicing contraception, rural India

Independent variable	Odds ratio
Experienced physical violence from husband	
No (r)	1.00
Yes	1.28*
Education	
None (r)	1.00
Primary	1.58*
Secondary+	1.11*
Parity	
1–2 (r)	1.00
3–4	2.19*
5+	3.08*
Has a living son	
No (r)	1.00
Yes	2.95*
Ever used a temporary method of contraception	
No (r)	1.00
Yes	1.60*
Index of wife's decisionmaking power	0.91*
Husband's education	
None (r)	1.00
Primary	1.02
Secondary	1.01
Higher	0.74
Household-asset ownership	
Low (r)	1.00
Medium	0.92
High	0.76
State of residence	
Bihar (r)	1.00
Jharkhand	0.86
Maharashtra	1.14
Tamil Nadu	1.41*

* Significant at $p \leq 0.05$.

Table 5

Odds ratio for women's reporting of physical violence perpetrated by their husbands and frequency of unwanted pregnancy, by three measures of pregnancy unwantedness, rural India

Unwanted pregnancy measure	Odds ratio for reporting of physical violence by husband	Frequency of unwanted pregnancy (percent)
Prospective measure	1.28*	23.3
Retrospective reporting of unwanted pregnancy	1.16	10.7
Retrospective reporting of unhappiness with pregnancy	1.21	5.3

* Significant at $p \leq 0.05$.