Does a Couple's Marital Quality Influence the Quality of their Contraceptive Use?

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Background

In western settings contraceptive adoption and continuous use have been found to be associated with relationship quality (Manlove et al., 2011; Manlove, Ryan & Franzetta, 2007, 2003; Manning, Longmore, & Giordano, 2000). This association, however, between relationship quality and contraceptive use is not consistent across studies. While some dimensions of relationship quality have been positively linked with aspects of contraceptive use, other dimensions have been negatively connected. Moreover, this linkage appears to vary over the relationship trajectory, and with contraceptive method type. For instance, research among teenage samples has found that adolescents in intimate relationships with higher levels of communication were more likely to adopt contraceptive methods (Manlove et al., 2007, 2003). Similarly, in a longitudinal study among a sample of low-income adult women in two southeastern cities of the United States, women who expected to receive emotional support from their partners upon becoming pregnant were more likely than their counterparts to report condom use or dual method use, and were less likely to not use any contraceptive method (Wilson & Koo, 2008). Also, studies

have found greater contraceptive use among couples in relationships characterized as romantic, and with higher levels of commitment and intimacy (Manlove et al., 2011; Manning, Longmore, & Giordano, 2000).

Alternately, specific contraceptive methods, especially condoms, have been negatively associated with higher relationship quality across samples (Sayegh et al., 2006; Woodrome et al., 2006; Katz et al., 2000). Research has consistently found condoms to be commonly used in short-term or casual relationships as opposed to established or long-term relationships (Wingood & DiClemente, 1998; Seidman, Mosher, & Aral, 1992; Catania et al., 1989). In fact, studies have noted declining condom use as commitment and intimacy increase over the trajectory of a relationship (Ku, Sonenstein, & Pleck, 1994; Langer, Zimmerman & Katz, 1994).

Along these lines, research suggests that use of condoms is reduced in relationships with greater commitment because of perceived invulnerability to harm from the partner (Agnew, 2000; Buunk & Bakker, 1997). Similarly, a study among African American women in the United States found that the women saw asking their partners to use condoms as admitting infidelity, and compromising the stability of their relationship (Wingwood & DiClemete, 1998). Alternately, another study, while finding similar linkages between women's commitment to their partners and attitude towards condom use, also discovered that nonetheless the more committed women felt greater control over condom use decision-making (Harvey et al., 2006). Similarly, a study among a nationally representative United States adolescent sample tracked a more nuanced association between contraceptive use and

relationship commitment (Kusunoki & Upchurch, 2011). According to the study, the likelihood of condom and hormonal method use increased in casual relationships if the female was familiar with the male partner. This usage, however, declined as commitment and duration of the relationship increased. For the men, on the other hand, the opposite was true with familiarity in less committed relationships reducing condom use (Kusunoki & Upchurch, 2011).

Although the directionality of association between relationship quality and contraceptive adoption remains unclear, a more robust relationship between relationship quality and continuous contraceptive use has been noted in several studies. Research in the United States has found positive linkages between aspects of relationship quality and effective and continuous contraceptive use. A study among a sample of Hispanic women found that the women who perceived their partners to be more committed were less likely to discontinue contraceptive use (Kerns et al., 2003). Similarly, research among adolescent samples has also indicated that females in more intimate and satisfying relationships, with higher levels of communication with their partners, were more likely to use contraceptives consistently and effectively (Manlove et al., 2007; Jorgenson et al., 1980). Analogously, relationship satisfaction and greater inter-personal female power within dyads promoted regular use of effective contraceptives in another study (Jorgensen et al., 1980). In addition, the belief that condom use builds trust with partners was a significant predictor of long-term continuous condom use in another study (Santelli et al., 1996).

Despite these findings in Western context, in Sub-Saharan African settings, interest in understanding the relationship context of contraceptive use is just emerging. Current couple research there has primarily focused on understanding the impact of partner characteristics and inter-personal variables such as couple communication, and household decision-making on contraceptive use (Link, 2011; Bogale et al., 2011; DeRose & Ezeh, 2010; Paz, 2004; Lasee & Becker, 1997). Research on the linkages between emotional processes within marriage and the potential role relationship quality may have on contraceptive use behaviors is sparse (Cox et al. 2014; Basu, 2006). A recent study from Ghana, using data from the broader study within which the current study is nested found a positive cross-sectional association between relationship quality domains and contraceptive use, especially the use of methods that required greater corporation from male partners such as condoms (Cox et al., 2014). Besides this study, most of the current research is limited to exploring the association of condom use with partnership type or relationship trust, and lacks in-depth analysis of the impact different domains of relationship quality have on a variety of contraceptive use behaviors, and use of methods beyond condoms (Westercamp et. al, 2010; Maharaj, 2005; Benefo, 2004; Maharaj & Cleland, 2004). Moreover, there is limited understanding of the mechanisms that promote greater couple communication, more egalitarian decision-making and gender relations within marriages, which are known to be associated with contraceptive use (Link, 2011; Derose and Ezeh, 2010; Upadhyay & Hindin, 2005; Soldan, 2004). Hence, exploring and analyzing the role of relationship quality in non-western contexts has the potential to enhance and expand our understanding of

the pathways in the marital relationship context that encourage positive contraceptive use behaviors.

Like in the west, across African samples, condom use has been found to be more common with casual partners (Westercamp et al., 2010; Maharaj, 2005; Maharaj & Cleland, 2004; Macaluso et al., 2000). In fact, frequently suggesting condom use in a steady relationship is considered taboo and seen as a sign of infidelity. For instance, a mixed methods study in Malawi investigating the reasons for low condom acceptance among married couples, found that while condom use was acceptable in 'sporadic sex', study participants considered its use within marriage unacceptable (Chimbiri, 2007). Similarly, a study in Zimbabwe found mistrust to be a major barrier preventing contraceptive use among married couples, and that condom use was more prevalent among couples who freely communicated with each other (Muhwava, 2004). In a qualitative study from Ghana, the male participants were concerned that women who used contraceptives were more likely to be 'unfaithful' and abandon their families. The females on the other hand expressed their inability to ignore their husbands' disapproval of contraceptives because of consequences such as denial of sex, husband preferring another wife, or even abandonment (Bawah et al., 1999). In fact, across African samples, women speak of covertly using contraceptives fearing their husbands' disapproval (Macphail et al., 2009; Oppong, 1977).

Clearly, this limited evidence highlights the important role couple relationship context and relationship quality plays in determining contraceptive use behaviors.

Moreover, like in other parts of the world, African marriages are also witnessing dramatic changes, making it pertinent to understand the impact these ongoing changes in the relationship context are having on contraceptive use. Many scholars have posited that factors such as declines in fertility and practices such as arranged marriages, individuals marrying at later ages, and increased popularity of contraception in Sub-Saharan Africa, are all indicative of shift taking place in traditional marital patterns there (Cherlin, 2011; Locoh and Mouvagha-Sow, 2008; Goode, 1963). In addition, from the limited available studies exploring the nature of marriages in Sub-Saharan Africa, there are indications of a move away from traditional patriarchal marriages to more egalitarian marriages; characterized by greater relationship empathy, communication, and negotiation of mutual spousal desires, especially in the urban areas (Miller and Kannae, 1999; Styen, 1996). Given these shifts in the nature of marriages and marital relationship context, understanding couple mechanisms that promote or inhibit contraceptive use can be useful in improving family planning programs and reducing unmet need for contraceptives.

In this study, we undertook a comprehensive analysis of the affect marital quality domains such as trust, commitment, and conflict have on a range of contraceptive use outcomes such as current use, type of method used, and continuity of use among a sample of female and male partners from peri-urban Ethiopia. Also, we analyzed these relationships cross-sectionally and longitudinally using two waves of the data, to allow temporal associations and address issues of causality.

Research Questions

This study aims to answer the following key research questions:

1. Does reporting higher marital quality increase the likelihood of spouse's reporting current and future use of contraceptives as compared to their counterparts with lower scores?
2. Does reporting higher marital quality scores increase the likelihood of spouse's reporting a coital-dependent (methods that require active male participation such as condom, traditional methods like withdrawal and rhythm) or long-acting/permanent contraceptive method (Implants, IUDs and Sterilization) versus a short-acting method (Injectable, Pill) use as compared to their counterparts with lower scores at baseline and over time?
3.
    a. Do females who report higher marital quality scores have a higher likelihood of greater length of continuous contraceptive use as compared to their counterparts with lower scores?
    b. Do females with male partners who report higher marital quality scores have a higher likelihood of greater length of continuous contraceptive use as compared to their counterparts with a spouse who reports lower scores?

Methods

Study Context and Site

Ethiopia is located in eastern Africa and is the second most populated country in Sub-Saharan Africa after Nigeria, and has a population of 87.5 million (World Bank, 2013). Ethiopia is also one of the world's poorest countries, with a per capita income of US $ 370, which is significantly lower than the regional average of US $ 1,257 (World Bank, 2013). Ethiopia was ranked in the low human development category in 2011, positioned at 173 out of 187 countries and territories (United Nations Human Development Report, 2011). The average life expectancy at birth for an average Ethiopian is 63 years (Population Reference Bureau, 2013).

The median age of first marriage for women in Ethiopia remains low at 16.5 years (Ethiopia Demographic and Health Survey (EDHS, 2011). The age at first marriage is higher for males at 23.1 years in 2011 (EDHS, 2011). Majority of Ethiopian marriages are monogamous, only 11% of the females reported living in polygynous unions (EDHS, 2011). Although, there is variation in marriage customs across religious and ethnic groups, in most cases, marriages are traditionally arranged by families with very brief engagement periods (Tilson & Larson, 2000). The bride joins the groom's house until the couple sets up their own household (Ezra, 2003). Divorce is prevalent, with 45% of first marriages ending in divorce within the first 30 years (Tilson & Larson, 2000). Traditionally, Ethiopian men and women have distinct roles and responsibilities within marriage. Males are viewed as the breadwinners, who work outside the home (Ezra, 2003). Females, on the other hand, primarily have household responsibilities, with childbearing and child rearing culturally seen as their most significant roles (Ezra, 2003). However, some studies have also noted shifting marriage patterns, especially in urban areas, with women's

education on the rise, as indicated by higher age at marriage, delay in the birth of the first child and greater egalitarian role expectations within marriage (Ezra, 2003; Sibanda et al., 2003).

Ethiopian women begin childbearing early, 34% of women in the ages 20-49 gave birth by age 18, and 54% gave birth by age 20 (EDHS, 2011). According to the EDHS (2011), the current total fertility rate (TFR) is 4.8 children per woman. Knowledge of contraceptives is very high in Ethiopia, with women (98%) and men (97%) equally likely to have heard of a modern contraceptive method. The government sector is the major provider of contraceptive services and caters to 82% of the modern contraceptive users. Twenty-seven percent of currently married women are using a modern contraceptive method, with the largest proportion (21%) using the injectable. There has been a substantial increase in the uptake of modern contraceptives since the year 2000, when only 6% currently married women were using modern contraceptives (EDHS, 2000). Also, there are large urban-rural differences in the uptake of modern contraceptives. While 52.5% of currently married women were using modern contraceptives in urban areas, only 23.4% were doing so in rural areas (EDHS, 2011). However, unmet need for contraceptives remains high at 25%, with 16% unmet need for spacing and 9% for limiting births (EDHS, 2011). The contraceptive discontinuation rate within a year for all methods is 37%, with the pill (70%) and condom (62%) most likely to be discontinued (EDHS, 2011).

The current study was conducted in a peri-urban town close to the capital city of

Addis Ababa.

Data and Sampling Design

Data for this study was collected as part of a larger ongoing study called Family Health and Wealth Study (FHWS) spanning five Sub-Saharan African countries, that aims to examine individual and family-level health and wealth consequences of family size. The study has followed 500-1000 family cohorts in peri-urban areas in Ethiopia, Ghana, Malawi, Nigeria and Uganda. Households were eligible for the study if their occupants included a couple formally married or in a stable union. A probability sample of households, where the wife was of childbearing age (16 to 44 years) and the husband aged 20 to 54 years was selected for the study. The enumeration areas (EAs) were selected probability proportional to size (PPS) and the number of households with eligible couples per EA targeted for each was also determined with PPS. A household census was conducted within each EA, followed by systematic selection of households. Occupants were enumerated and eligible couples identified. Both partners of eligible couples were consented; if one or both did not consent to participate in the study, the field team selected another eligible couple from the same household or an adjacent household. In cases where a family head had multiple wives, only one randomly selected wife was interviewed. Across all EAs, couple participation rates were above 95% and interview completion rates were uniformly high. The survey questionnaire, administered separately to husbands and wives, covered a range of questions on marital quality, fertility preferences and contraceptive use among other topics. The first round of the Ethiopian FHWS in 2010 consisted of 998 couples; the second round re-interviewed

746 couples (75%) a year later.

Measures

Key independent measure

Marital quality (MQ)

MQ measures included in the FHWS consisted of four independent validated western scales capturing dimensions of trust (Larzelere & Huston 1980), commitment (Harvey et al., 2006; Sternberg, 1997), constructive communication, (Heavey et al. 1996; Christensen & Sullaway 1984) and satisfaction (Spanier 1976) in a relationship. The MQ scale was initially conceptualized as a four-factor scale mirroring the four validated western scales, but was later re-specified as a three-factor scale for the female and male partners separately after assessing scale reliability and validity by conducting exploratory and confirmatory factor analysis with the baseline sample, and then repeating the confirmatory factor analysis with the follow-up sample.

The final total MQ scale consisting of three sub-scales of trust, commitment, and conflict were highly reliable with Cronbach's alphas of 0.94 and 0.89 for female and male partners respectively. Some scale items were reverse scored for ease of interpretability, so that a bigger score indicates higher total marital quality, higher trust, higher commitment, and reduced conflict. The final scale scores for the MQ measures were derived from the results of the exploratory factor analysis from the baseline survey conducted in Stata version 12 (StataCorp 2011).

Key Dependent Measures

Contraceptive use outcomes: Three contraceptive use outcomes used for the analysis are described below.

1) Partner-specific report of contraceptive use was measured as a binary outcome (no=0/ yes=1) indicating if the female partner reported using a contraceptive method. For the male partners, the outcome indicated if a contraceptive method was used during their last sexual encounter. Since, 99.5% of the males at baseline and 99.7% of the males at the follow-up reported that their last sexual encounter was with either their wife or long-term partner, this measure was used as an indicator of contraceptive use in marital relationships.

2) Type of method (short-acting, long-acting, and coital-dependent) was measured as a categorical variable coded 0, 1 and 2 to indicate whether the female or the male partner reported using a short-acting method (pills, injectable), a coital- dependent method (condoms, traditional methods such as periodic abstinence, withdrawal) or a long-acting method/permanent method (IUD, implant, sterilization).

3) Consistent contraceptive use was measured as a continuous variable and indicated the length of the last episode of consistent use. We constructed this measure from the female partners' recall of their contraceptive use patterns at follow-up. While the data was collected for 60 months prior to follow-up, we included women with episodes of 36 months or less so as to avoid over attributing the effect of marital quality on length of use as the baseline survey was conducted

12 months before the follow-up.

Background Variables

A range of socio-demographic, household-level and couple-level variables known to influence contraceptive use were included in our analysis such as respondents' age, education, parity, household wealth, religion and spousal age difference. Age and education were measured in years as continuous variables indicating age and schooling in years. Parity, which specifies the number of times a woman has given birth, was assessed using the female partners' response on a series of questions about her childbirth history. Household wealth was constructed through a principal components analysis of household assets and housing characteristics, such as ownership of consumer items, and type of dwelling. The index score was then used to divide the households into quintiles that indicate poorest, poor, middle, richer and richest. Religion was categorized as Christians and other religions. Spousal age difference was measured by subtracting the female partners' age from the male partners' age.

Statistical Analysis

We first conducted exploratory data analysis. We examined the data spread, frequency distributions, outliers, and patterns of missing values to ascertain appropriate treatment of variables. This was followed by univariate analysis to check frequency distributions and summary statistics, like means and variances for the continuous variables and proportions for categorical variables.

For the longitudinal analysis, we limited our sample to the couples who participated in both survey rounds. In order to determine potential bias due to loss-to-follow-up at the second round of data collection, we checked for significant differences between couples lost-to-follow-up versus couples who were relocated to identify potential reasons for loss and determine appropriate data management strategies (Kristman et al. 2004). The couples who remained in the study and those lost-to-follow-up did not vary significantly on the key contraceptive use outcomes. There were some demographic differences between the two samples. The females in the lost-to-follow-up sample were on average 1.7 ($p\ value\ < 0.001$) years younger and their male partners 2.25 ($p\ value\ < 0.001$) years younger than their counterparts in the follow-up sample. The two samples also did not vary significantly by education levels or wealth quintile. We, thus, proceeded with the analysis on the relocated sample without making any adjustments for loss-to-follow up.

Following the exploratory data analysis, we conducted bivariate analysis to assess the significance of relationships between outcomes and key independent variables. Next we estimated multivariate logistic, multinomial and cox regression models based on the nature of the outcome variable. We utilized logistic regression to analyze the association of contraceptive use with marital quality measures because of the binary nature of the variable. For the analysis with type of method, we performed a multinomial logistic regression because of the categorical nature of the outcome. For both these outcomes, contraceptive use and method type, we estimated their associations with the marital quality measures at baseline, and then

repeated the analysis to estimate longitudinal association of baseline martial quality with these outcomes at the follow-up survey to address issues of reverse causality.

To examine the association of marital quality measures with consistency in contraceptive use, the female and male partners' baseline marital quality scores and the female partners' historical account of her contraceptive use patterns at the follow-up were used. Since, the number of children a couple has is highly likely to be associated with parity, we also conducted the analysis stratifying by parity groups of women 0-2 and 3 or more children. The likelihood of a woman to continuously use a contraceptive method was analyzed using cox proportional hazard regression. Hazard regression analysis is a dynamic way to model an event like duration of contraceptive use, as the event unfolds over time. The hazard in the cox model is divided into two parts: 1) A baseline hazard, which is a function of time and 2) and the covariate effect. The log of the hazard here is assumed to be a sum of these two components. In this model the baseline hazard function is not explicitly modeled and hence does not require any distributional assumptions. The covariate portion is specified parametrically, as a linear combination of the covariates. Hence, the ratio of the hazard function for two specified values of a covariate at any given point in time is constant, in other words, the hazard function values are proportional. The reasonableness of this assumption was examined by looking at interactive effects between time and covariates of interest.

Results

Sample Characteristics and Distribution of Key Variables

Socio-demographic measures

Tables 1-2 provide detailed description of the socio-demographic characteristics and distribution of key variables in the sample. The mean age of the female partners at the baseline was 28.5 (SD=6.3) years (Table 1). The males on average were older than their female counterparts; their mean age at the baseline was 35.2 (SD=8.1) years. The females on average had attended school for 7.1 years (SD = 4.6) at the baseline. The women in the follow-up sample were slightly less educated with an average of 7.0(SD = 4.6) years of schooling. The males on average had more schooling than their female partners at baseline (Mean 9.0, SD = 4.6). The mean parity among couples at the follow-up was 2.3 (SD =1.7) children.

Contraceptive use measures

Table 1 also provides a description of current contraceptive use and type of method used at baseline and follow-up surveys, and mean duration of the last contraceptive use episode at the follow-up. At baseline, 76.7% of the female partners were contraceptive users, and this proportion remained unchanged at the follow-up (76.8 %). Among the males, 74.9% were users at baseline; this proportion decreased to 71.4 % at the follow-up survey. In terms of type of method used, short-acting methods, especially the injectable was most popular. At baseline, 70.1 % of the female partners were using short-acting methods; this proportion (66.2%) went down at the follow-up. At follow-up, levels of long-acting methods use increased to

19.1% from 15.8% among the females. The mean duration of the latest contraceptive use episode from the follow-up going back 36 months was 15.2 months (SD=9.4).

Marital quality scores

Table 2 provides a description of the marital quality scores at baseline. At the baseline, mean total marital quality score for the female sample was 17.47 (SD= 2.15, range: 3.20-18.80). For the male partners, the mean total marital quality score at baseline was 14.94 (SD=1.22, range: 4.28-16.51). The mean baseline commitment score for the female partners was 5.48 (SD=1.42, range: -2.68–9.99, the mean trust score was 3.14 (SD=0.99, range: -2.67- 5.05), and the mean female conflict score was 8.85 (SD=1.20, range: -1.18–10.45) Similarly, for the males, the mean baseline commitment score was 4.68 (SD=0.70, range: -3.57–7.26), the mean trust score was 6.90 (SD=1.00, range: 0.17-9.14), and the mean conflict score was 3.37(SD= 0.54, range: -0.63–5.57).

Results of the Regression Analyses

Marital quality and current contraceptive use

Table 3 provides a description of the association of marital quality measures with female and male partners report of contraceptive use at baseline and over time. While for the female partners, no association between current contraceptive use and marital quality scores was found in baseline and over time models, for the male partners these associations were statistically significant in the over time models.

The male total marital quality and trust scores were significantly associated with contraceptive use over time. A one-unit change in the male partners' total marital quality score at baseline increased the odds of reporting use by 17% (OR: 1.17, CI= 1.01-1.35) at follow-up in the multivariate model. Similarly, a one-unit increase in the husbands' trust score at baseline increased the odds of use at follow-up by 35% (OR: 1.35, CI= 1.13-1.60) after adjusting for covariates.

Marital quality and type of method

Table 4 provides a description of the association of marital quality measures with type of method used. Only the females' commitment score in the baseline models, and the males' total marital quality and trust scores in the over time models were associated with type of method use. Interestingly, while an increase in the females' commitment score increased the relative risk of using a coital-dependent method versus a short-acting method use, the males' total marital quality and trust scores reduced this risk. A one-unit increase in the female partners' commitment score increased the relative risk of coital-dependent method use versus short-acting method use by 29% (RRR: 1.29, CI=1.01-1.65) in the adjusted model at baseline. For the male partners, a one unit increase in the baseline total marital quality and trust scores significantly reduced the risk of coital-dependent method use versus short-acting method use at follow-up by 23% (RRR: 0.77, 95% CI=0.61-0.97) and 25% (RRR: 0.75, 95% CI=0.57-0.99) respectively.

Marital Quality and Continuous Use

Interestingly, while the females' marital quality scores were not associated with her length of use, the male partners' marital quality measures were significantly associated with her length of use. The males' conflict score had the strongest effect on the females' length of use, followed by trust, commitment and total marital quality scores. A unit increases in the males' conflict score (indicating decreased conflict) decreased the female partners' hazard of discontinuing use by 57% after adjusting for background covariates (HR: 0.43, 95% CI = 0.27-0.68). Similarly, a unit increase in the males' total marital quality score decreased the female partners' hazard of discontinuing contraceptive use by 18 % after adjusting for background covariates (HR: 0.82, 95% CI = 0.74-0.91). In the samples stratified by parity, the males' marital quality measures had a stronger effect on length of use for women with 3 or more children as opposed to women with 0-2 children. For e.g., a unit increase in the males' conflict score decreased the hazard of discontinuing use by 73% (HR: 27, 95% CI = 0.11-0.68) among females with 3 or more children, whereas, the decrease was only 47% (HR: 53, 95% CI =0.29- 0.95) among females with 0-2 children.

Discussion

Our study findings suggest that a couple's marital quality has a significant impact on critical contraceptive use outcomes such as current use, type of method adopted and continuity of use in peri-urban Ethiopia. Interestingly, these associations had greater strength and significance for male partners' report of contraceptive use outcomes as compared to their female counterparts. Also, while the male partners'

marital quality scores were significantly and positively associated with the females' length of use, the female partners' own scores did not have any impact.

While the female marital quality scores were not significantly associated with contraceptive use, the male partners' baseline total marital quality and trust scores were positively associated with use at follow-up. Currently available research suggests a complex relationship between marital quality and current use; however, the gender differences noted in our study have not been reported (Wilson and Koo, 2008; Manlove et al., 2007, 2003; Sayegh et al., 2006; Woodrome et al., 2006). It is unclear why only the male marital quality measures would be associated with contraceptive use. One potential reason for the significant association between male marital quality measures with current use in our sample, especially since majority of the females were using non-coital methods, is perhaps indicative of the fact that males who reported higher scores were more communicative with their wives and had greater awareness of their method use. Along the same lines, another explanation, given the strong association of male trust scores with use, could indicate that wives who perceived greater trust from their husbands were more likely to communicate and jointly decide contraceptive practices with their husbands. Current literature supports the hypothesis that increased spousal communication is associated with contraceptive use (Link, 2011; Paz, 2004; Becker, 1996). Moreover, studies from Sub-Saharan Africa indicate that lack of trust and fear of partner disapproval forces some women to use contraceptives covertly (Macphail et al., 2009; Muhwava, 2004, Bawah et al., 1999; Oppong, 1977). While it was not assessed in the current study, another potential reason for these results

may be greater social desirability bias among males found in prior studies from similar settings. For instance, a study in India found that while the husbands' portrayed a more liberal picture of their wives' autonomy in survey responses, they tended to display more conservative attitudes when interviewed in-depth (Jejeebhoy, 2002). Another study in Malawi examining couple agreement on a range of issues from household wealth to discussion on family size and contraceptive use found that for many questions, when the responses of the spouses lacked concordance, husbands were more likely to answer 'yes' and wives 'no' when 'yes' was the more 'desirable' response (Miller, Zulu & Watkins, 2001).

Interestingly, both the female and male marital quality measures were associated with type of method used, albeit, differently. Moreover, the male partners' results were more robust as they were significant in the over time models. The female partners' commitment score significantly increased the relative risk of using coital-dependent versus short-acting methods in the baseline models. For the males, higher baseline trust scores significantly reduced the risk of reporting coital-dependent method relative to short-acting method use at follow-up. While the reasons for these gender differences are unclear, findings from the female sample are more aligned with our initial hypothesis. In marriages, where partners report higher marital quality scores, we would expect increased spousal communication and increased male participation in contraceptive use decision-making. These results, therefore, could indicate that females, who reported they were in a high quality marriage, were more successful in negotiating use of methods that required greater male participation like condoms. Earlier studies from western setting have

noted similar nuanced associations between method use and relationship quality, especially condoms. For instance, a study found that despite adverse beliefs connected with condoms and difficulty in negotiating use, women in more committed relationships felt greater control over condom use decision-making (Harvey et al., 2006). Similarly, another study found that the likelihood of condom and hormonal method use increased in casual relationships for females if she was familiar with the male partner, but this was not the case among the males (Kusunoki & Upchurch, 2011). On the other hand, the opposite affect of the males' trust score on method adopted in the over time models, like the case of contraceptive use, could be reflective of the possibility that women who perceived greater trust from their husbands were more likely to communicate and not hide their contraceptive use practices from them. A study from Ghana, also using the FHWS data, found a cross-sectional association between male and female trust scores on the females' report of use of methods that did not require active male participation and concluded similarly (Cox et al., 2014).

Surprisingly, although all the male marital quality measures were strongly and positively associated with the females' length of use, their own scores had no effect on continuity of use. Moreover, these effects were stronger when couples had achieved their desired parity levels. While prior studies have noted a robust association between aspects of marital quality and continuity of contraceptive use in western samples, the positive effect of male marital quality scores on female partners' length of use is unique to our study (Manlove et al., 2007; Kerns et al., 2003; Jorgenson, 980). Our findings highlight the critical role the marital

relationship context has on the female partners' practice of contraception, more critical than her own evaluation of her marriage. These findings conceivably point to continued dominance of men in marital decision-making in this setting, especially as it pertains to long-term decision-making, and highlights the continued need to target men and couples to successfully reduce unmet need for contraception in this setting.

Our study has several limitations that warrant discussion. While probability-sampling methods were used to recruit participants into the FHWS study, but since the study was located in one peri-urban site, with a fairly homogeneous population, the generalizability of the findings is limited to similar settings. Our study was also based on secondary data, which limits the availability of other variables of potential interest for dyadic research. For instance, because of the lack of validated measures of power differentials between couples in the current study, we were unable to examine their probable association with variation in marital quality. These may be critical given that gender differences seem to play a prominent role in the association of marital quality and contraceptive use measures in this peri-urban Ethiopian community.

In addition, social desirability bias is a potential issue associated with self-reported data. Marital quality measures can be prone to social desirability bias because of the sensitive nature of the subject matter. Several checks to ensure complete privacy and confidentiality of participants were followed during data collection. We also checked for interviewer effects with the follow-up data. Overall the interviewer

effects were small, although they were stronger for the males, and they varied by marital quality measures. Given these results, we did not include the interviewer indicator or make any adjustments to account for the interviewer effects in subsequent analysis. Many western studies now utilize interviewer ratings of dyadic interactions along with self-reported data to overcome issues of social desirability bias (Lawrence et al., 2011). This might be a useful strategy that future research can explore in non-western setting too.

At the same time, this study has several strengths. To the best of our knowledge, this study is a pioneering research effort to understand the role marital quality plays on a range of contraceptive use outcomes in Ethiopia using data from both male and female partners. Findings from our study fill an important research gap and hope to broaden understanding of the influence couple relationship context has on contraceptive use. In fact, marital quality could be a potential pathway that links established association between contraceptive use and spousal communication and household decision-making, a linkage that future research could explore. Our study also utilized a range of marital quality sub-scales and contraceptive use measures, which enabled us to explore the impact of different marital quality domains on a range of contraceptive use outcomes. Moreover, these associations were explored at baseline and longitudinally to manage causal issues of temporality.

Conclusion

These findings show marital quality and contraceptive use behaviors for peri-urban Ethiopian couples are associated, although the structures of these relationships are

complex and gendered. Broadening our understanding of couple relationship dynamics can potentially enhance our knowledge of critical couple mechanisms that family planning programs can tap into to improve contraceptive use outcomes among spouses.

References

Agnew, C. R. (1999). Power over Interdependent Behavior Within the Dyad: Who Decides What a Couple Does? In L. J. Severy, & W. B. Miller (Eds.), *Advances In Population: Psychosocial Perspectives* (3rd Ed., Pp. 163-188). London: Kingsley, Jessica.

Basu, A. M. (2006). The emotions and reproductive health. *Population and Development Review, 32*(1), 107-121.

Bawah, A. A., Akweongo, P., Simmons, R., & Phillips, J. F. (1999). Women's fears and men's anxieties: The impact of family planning on gender relations in northern Ghana. *Studies in Family Planning, 30*(1), 54-66.

Benefo, K. D. (2004). Are partner and relationship characteristics associated with condom use in zambian non-marital relationships? *International Family Planning Perspectives, 30*(3), 118-127.

Bogale, B., Wondarfrash, M., Tilahun, T., & Girma, E. (2011). Married Women's Decision Making Power on Modern Contraceptive Use In Urban And Rural Southern Ethiopia. *BMC Public Health, 11,* 342.

Buunk, B. P., & Bakker, A. B. (1997). Commitment To The Relationship, Extra Dyadic Sex, And AIDS Preventive Behavior. *Journal of Applied Social Psychology, 27,* 1241-1257.

Catania, J., Kegeles, S., & Coates, T. (1990). Towards An Understanding Of Risk Reduction Model (AARM). *Health Education Quarterly, 17,* 27-39.

Cherlin, A. J. (2012). Goode's world revolution and family patterns: reconsideration at fifty years. *Population and Development Review, 38*(4), 577-607.

Chimbiri, A. M. (2002). *Women's Empowerment, Spousal Communication and Reproductive Decision-Making in Malawi.* Ph.D. Dissertation, University Of Waikato, Hamilton, New Zealand. Unpublished

Christensen, A., & Sullaway, M. (1984). *Communication Patters Questionnaire. Unpublished Manuscript.* . University Of California, Los Angeles.

Derose, L. F., & Ezeh, A. C. (2010). Decision Making Process and Contraceptive Use: Evidence From Uganda *Population Research Policy Review, 29,* 423-439.

Goode, W.J. (1963) *World Revolution and Family Patterns*. New York: The Free Press.

Harvey, S. E., Beckman, L. J., Gerend, A. M., Bird, T. S., Posner, S., Huszti, C. H., Et al.. (2006). A Conceptual Model Of Women's Condom Use Intentions: Integrating Intrapersonal And Relationship Factors. *AIDS Care, 18(7),* 698-709.

Heavey, C. L., Larson, B. M., Zumtobel, D. C., & Christensen, A. (1996). The Communication Patterns Questionnaire: The Reliability And Validity Of A Constructive Communication Subscale. *Journal of Marriage And Family, 58(3),* 796-800

Jejeebhoy, S. J. Convergence and divergence in spouses' perspectives on women's autonomy in rural India. *Studies in Family Planning,* 2002, *33*(4): 299-308.

Jorgensen, S. R., King, S. L., & Torrey, B. A. (1980). Dyadic And Social Network Influences On Adolescent Exposure To Pregnancy Risk *Journal Of Marriage And Family, 42(1),* 141-156.

Katz, B. P., Fortenberry, J. D., Zimet, G. D., Blythe, M. J., & Orr, D. P. (2000). Partner-specific relationship characteristics and condom use among young people with sexually transmitted diseases. *Journal of Sex Research, 37*(1), 69-75.

Kerns, J., Westhoff, C., Morroni, C., & Murp, A. P. (2003). Partner Influence On Early Discontinuation Of Pill In A Predominantly Hispanic Population. *Perspectives On Sexual And Reproductive Health, 35(6),* 256-260.

Kristman, V., Manno, M., & Côté, P. (2004). Loss to follow-up in cohort studies: How much is too much? *European Journal of Epidemiology, 19*(8), 751-760.

Ku, L., Sonenstein, F. L., & Pleck, J. H. (1994). The dynamics of young men's condom use during and across relationships. *Family Planning Perspectives, 26*(6), 246-251.

Kusunoki, Y., & Upchurch, D. M. (2011). Contraceptive method choice among youth in the united states: The importance of relationship context. *Demography, 48*(4), 1451-1472.

Langer, L. M., Zimmerman, R. S., & Katz, J. A. (1994). Which is more important to high school students: Preventing pregnancy or preventing AIDS? *Family Planning Perspectives, 26*(4), 154-159.

Larzelere, R. E., & Huston, T. L. (1980). The Dyadic Trust Scale: Toward Understanding Interpersonal Trust in Close Relationships. *Journal Of Marriage And Family, 42(3),* 595-604.

Lasee, A., & Becker, S. (1997). Husband-Wife Communication about Family Planning And Contraceptive Use In Kenya. *International Family Planning Perspectives, 23(1),* 15-33.

Lawrence, E., Barry, R. A., Brock, R. L., Bunde, M., Langer, A., Ro, E., . . Dzankovic, S. (2011). The relationship quality interview: Evidence of reliability, convergent and divergent validity, and incremental utility. *Psychological Assessment, 23*(1), 44-63.

Link, C. F. (2011). Spousal communication and contraceptive use in rural Nepal: An event history analysis *Studies in Family Planning, 42(2),* 83-92.

Locoh, T., & Mouvagha-Sow, M. (2008). An uncertain future for African families In R. Jayakody, A. Thornton, & W. Axinn (EDS.,), *International Family Change Ideational Perspectives.* Lawrence Eribaum Associates.

Macaluso, M., Demand, M. J., Artz, L. M., & Hook III, E. W. (2000). Partner type and condom use. *AIDS, 14*(5), 537-546

MacPhail, C., Terris-Prestholt, F., Kumaranayake, L., Ngoako, P., Watts, C., & Rees, H. (2009). Managing men: Women's dilemmas about overt and covert use of barrier methods for HIV prevention. *Culture, Health and Sexuality, 11*(5), 485-497.

Maharaj, P. (2005). Patterns of condom use: Perspectives of men in KwaZulu-natal, South Africa. *Development Southern Africa, 22*(2), 187-197.

Maharaj, P., & Cleland, J. (2004). Condom use within marital and cohabiting partnerships in KwaZulu-natal, south africa. *Studies in Family Planning, 35*(2), 116-124.

Manlove, J., Ryan, S., & Franzetta, K. (2003). Patterns of contraceptive use within teenagers' first sexual relationships. *Perspectives on Sexual and Reproductive Health, 35*(6), 246-255.

Manlove, J., Ryan, S., & Franzetta, K. (2007). Contraceptive Use Patterns Across Teens' Sexual Relationships: The Role Of Relationships, Partners, And Sexual Histories. *Demography, 44(3),* 603-621.

Manlove, J., Welti, K., Barry, M., Peterson, K., Schelar, E., & Wildsmith, E. (2011). Relationship characteristics and contraceptive use among young adults. *Perspectives on Sexual and Reproductive Health, 43*(2), 119-128.

Manning, W. D., Longmore, M. A., & Giordano, P. C. (2000). The relationship context of contraceptive use at first intercourse. *Perspectives on Sexual and Reproductive Health, 32*(3), 104-110.

Miller, N. B., & Kannae, L. (1999). Predicting marital quality In Ghana. *Journal Of Comparative Family Studies, 30(4),* 599.

Miller, K., Zulu, E. M., & Watkins, S. C. (2001). Husband-wife survey responses in malawi. *Studies in Family Planning, 32*(2), 161-174.

Muhwava, W. (2004). Condom use within marriage and consensual unions in the era of HIV/AIDS in Zimbabwe. *African Population Studies* 19(1), 119-141.

Oppong, C. (1977). Family type and size: Some recent evidence from ghana (fertility determinants). *The Economic and Social Supports for High Fertility. Proc.Conf.Canberra, 16-18 November 1976,* , 345-354.

Paz Soldan, V. A (2004). How family planning ideas are spread within social groups in rural Malawi. *Studies in Family Planning*, *35*(4): 275-290.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika, 70*(1), 41-55

Upadhyay, U. D., & Hindin, M. J (2005). Do higher status and more autonomous women have longer birth intervals? Results from Cebu, Philippines. *Social Science and Medicine*, 60(11): 2641–2655.

Westercamp, N., Moses, S., Agot, K., Ndinya-Achola, J. O., Parker, C., Amolloh, K. O., & Bailey, R. C. (2010). Spatial distribution and cluster analysis of sexual risk behaviors reported by young men in kisumu, kenya. *International Journal of Health Geographics*

Woodrome, S. E., Zimet, G. D., Orr, D. P., & Fortenberry, J. D. (2006). Dyadic alcohol use and relationship quality as predictors of condom non-use among adolescent females. *Journal of Adolescent Health, 38*(3), 305-306.

Wilson, E. K., & Koo, H. P. (2008). Associations Between Low-Income Women's Relationship Characteristics And Their Contraceptive Use. *Perspectives On Sexual And Reproductive Health, 40(3),* 171-179.

Wingood, G. M., & Diclemente, R. J. (1998). Partner Influences And Gender---Related Factors Associated With Non Condom Use Among Young Adult African American Women. *American Journal Of Community Psychology, 26(1)*

Santelli, J. S., Kouzis, A. C., Hoover, M. P., Burwell, L. G., & Celentano, D. D. (1996). Stages Of Behavior Change For Condom Use: The Influence Of Partner Type, Relationship And Pregnancy Factors. *Family Planning Perspectives, 28(3),* 101-107.

Sayegh, M. A., Fortenberry, J. D., Shew, M., & Orr, D. P. (2006). The Developmental Association Of Relationship Quality, Hormonal Contraceptive Choice And Condom Non-Use Among Adolescent Women. *Journal of Adolescent Health, 39,* 388-395.

Seidman, S. N., Mosher, W. D., & Aral, S. O. (1992). Women with multiple sexual partners: United states, 1988. *American Journal of Public Health, 82*(10), 1388-1394.

Sternberg, R. J. (1997). Construct Validation Of A Triangular Love Scale. *European Journal Of Social Psychology, 27,* 313---335.

Spanier, G. B. (1976). Measuring Dyadic Adjustment: New Scales For Assessing The Quality Of Marriage And Similar Dyads. *Journal of Marriage and Family* , 38(1), 15-28

StataCorp. 2011. *Stata Statistical Software: Release 12*. College Station, TX: StataCorp LP.

Steyn, A.F (1996). Values that Support Quality Marital and Family Life. *South African Journal of Sociology*, 27(4), 143-147

Table 1
Descriptive Statistics of Outcome and Background Variables at Baseline and Follow-up Surveys by Spouse

	Baseline (n=986)		Follow-up (n=728)	
Variables	***Wife***	***Husband***	***Wife***	***Husband***
Age in Years *(mean/SD)*	28.5 (6.3)	35.7 (8.1)	30.4 (6.3)	37.5 (9.1)
Years of education *(mean/SD)*	7.1 (4.6)	8.9 (4.6)	7.1 (4.6)	8.96 (4.67)
Parity *(mean/SD)*	2.1 (1.3)		2.3 (1.7)	
Contraceptive users (*%/n)*	76.7 (751)	74.9 (729)	76.8 (514)	70.9 (520)
Contraceptive use by method type *(%/n)*	**100.0 (751)**	**100.0 (729)**	**100.0 (514)**	**100.0 (520)**
Short-acting method	70.1 (525)	75.2 (542)	66.2 (337)	71.5 (372)
Coital dependent method	14.2 (106)	11.8 (85)	14.7 (75)	11.9 (62)
Long-acting method	15.8 (118)	13.0 (94)	19.1 (97)	16.5 (86)
Duration of latest contraceptive episode in months *(mean/SD) **			15.2 (9.4)	

* Duration measured for 36 months before follow-up survey

Table 2

Descriptive Statistics of Spouses' Total and Sub-scale Marital Quality (MQ) Variables at Baseline (n=986)

Predictor Scales	Wife	Husband
MQ total score (mean/SD)	**17.50 (2.12)**	**14.95 (1.18)**
(range)	(3.20-18.80)	(4.28-16.51)
Commitment score (mean/SD)	**5.51 (1.07)**	**4.68 (0.72)**
(range)	(-1.29-9.99)	(-3.56-7.15)
Trust Score (mean/SD)	**3.14 (0.97)**	**6.90 (0.98)**
(range)	(-2.39-4.92)	(0.17-9.14)
Conflict Score (mean/SD)	**8.84 (1.24)**	**3.38 (0.52)**
(range)	(-1.18-10.43)	(0.24 -5.57)

Table 3

Multivariate Logistic Regression Results of Spouses' Total and Sub-scale Marital Quality (MQ) Measures at Baseline on Contraceptive use at Baseline and Follow-up Surveys

Predictor Scales at Baseline	Wife Baseline (n=977)		Wife Follow-up[2] (n=663)		Husband Baseline (n=986)		Husband Follow-up[2] (n=728)	
	Unadjusted OR (CI)	*Adjusted[1] OR (CI)*	*Unadjusted OR (CI)*	*Adjusted[1] OR (CI)*	*Unadjusted OR (CI)*	*Adjusted[1] OR (CI)*	*Unadjusted OR (CI)*	*Adjusted[1] OR (CI)*
MQ Total	0.96 (0.88-1.03)	0.95 (0.87-1.02)	0.95 (0.86-1.06)	0.95 (0.86-1.05)	1.01(0.99-1.12)	1.01 (0.99-1.02)	1.15 (1.01-1.30)**	1.17 (1.02-1.35)**
Trust	0.91 (0.83-1.07)	0.91 (0.84-1.08)	0.82 (0.67-1.02)	0.83 (0.65-1.05)	1.13 (0.98-1.29)*	1.14 (0.98-1.31)*	1.30 (1.11-1.53)**	1.35 (1.13-1.60)**
Commitment	0.95 (0.83-.09)	0.94 (0.82-1.09)	0.88 (0.69-1.11)	0.87 (0.69-1.11)	1.01(0.81-1.24)	1.02 (0.81-1.27)	0.86 (0.67-1.11)	0.84 (0.65-1.09)
Conflict	0.98 (0.85-1.10)	0.94 (0.82-1.08)	1.00 (0.85-1.16)	1.00 (0.79-1.08)	0.91 (0.70-1.19)	0.95 (0.71-1.26)	0.99 (0.73-1.34)	1.09 (0.75-1.51)

* * p value < 0.05; *p value < 0.10

[1]Model adjusted for respondent's age, education, religion, parity, wealth-quintile, and spousal age difference

Table 4

Multinomial Logistic Regression Results of Spouses' Total and Sub-scale Marital Quality Scores at Baseline on Type of Contraceptive Method Used at Baseline and Follow-up Surveys

		Wife Baseline (n=751)		**Wife Follow-up[2] (n=509)**		**Husband Baseline (729)**		**Husband Follow-up[2] (520)**	
Outcome	Predictor Scales Baseline	*Unadjusted RRR (CI)*	*Adjusted[1] RRR (CI)*	*Unadjusted RRR (CI)*	*Adjusted[1] RRR (CI)*	*Unadjusted RRR (CI)*	*Adjusted[1] RRR (CI)*	*Unadjusted RRR (CI)*	*Adjusted[1] RRR (CI)*
Ref Group: Short-acting									
Coital-dependent									
	MQ Total	1.18 (1.03-1.35)**	1.16 (1.00-1.33)*	1.09 (0.94-1.23)	1.05 (0.89-1.25)	0.97 (0.88-2.09)	0.92(0.79-1.19)	0.86(0.69-1.07)	0.77(0.61-0.97)**
	Trust	1.01 (0.82-1.24)	0.99 (0.78-1.23)	1.38 (0.98-1.96)*	1.32 (0.90-1.94)	0.88 (0.72-1.09)	0.82 (0.66-1.03)*	0.80 (0.62-1.04)*	0.75(0.57-0.99)**
	Commitment	1.35 (1.07 -1.70)**	1.29(1.01 -1.65) **	0.99 (0.88-1.81)	1.14 (0.77-1.68)	1.36 (0.88-2.09)	1.21 (0.77-1.94)	0.97 (0.67-1.41)	0.91 (0.62-1.33)
	Conflict	1.27 (1.01-1.70)*	1.25 (0.96-1.60)	0.99 (0.80-1.14)	0.93 (0.74-1.16)	0.99 (0.66-1.49)	1.02 (0.64-1.61)	1.14 (0.65-2.00)	0.97 (0.52-1.80)
Long-acting									
	MQ Total	1.09 (0.98-1.20)	1.07 (0.96-1.20)	0.98 (0.79-1.27)	1.00 (0.90-1.11)	0.91 (0.79-1.19)	0.88 (0.73-1.04)	0.96 (0.74-1.22)	0.94 (0.71-1.24)
	Trust	0.96 (0.79-1.16)	0.94 (0.7-1.15)	0.92 (0.75-1.15)	0.98 (0.79-1.23)	1.00 (0.79-1.27)	0.97 (0.76-1.25)	0.89 (0.62-1.04)	0.82 (0.63-1.08)
	Commitment	1.22 (0.99-1.49)*	1.20 (0.97-1.48)*	1.08 (0.79-1.26)	1.09 (0.86-1.40)	0.83 (0.63-1.09)	0.78 (0.58-1.04)*	0.80 (0.58-1.12)	1.14 (0.84-1.53)
	Conflict	1.16 (0.96-1.40)	1.15 (0.94-1.40)	0.96 (0.85-1.11)	0.97 (0.81-1.16)	0.93 (0.63-1.37)	0.91 (0.61-1.36)	0.91 (0.64-1.30)	0.91 (0.63-1.30)

* * p value <0.05; *p value <0.10

[1]Model adjusted for respondent's age, education, religion, parity, wealth-quintile, and spousal age difference

Table 5

Multivariate Cox Proportional Hazard Regression Results of Spouses' Total and Sub-scale Marital Quality (MQ) Measures at Baseline on Continuous Contraceptive Use for 36 Months or Less from the Follow-up Survey

	Wife			Husband		
	All (users) [1]	**Parity (0-2) [2]**	**Parity (3+) [3]**	**All (users) [1]**	**Parity (0-2) [2]**	**Parity (3+) [3]**
Predictor Scales (Baseline)	*HR (CI)*	*HR (CI)*	*HR (CI)*	*HR (CI)*	*HR (CI)*	*HR (CI)*
MQ Total	1.07 (0.93-1.24)	1.08 (0.88-1.31)	1.03 (0.87-1.21)	0.82(0.74-0.91)**	0.86 (0.76-0.97)**	0.71(0.58-0.89)**
Trust	1.19 (0.78-1.79)	1.22 (0.68-2.19)	1.01 (0.64-1.60)	0.59 (0.42-0 .84)**	0.70(0.46-1.05)**	0.30 (0.14-0.68)**
Commitment	1.26 (0.78-2.05)	1.23 (0.66-2.29)	1.16 (0.63- 2.14)	0.69 (0.57-0 .84)**	0.74 (0.58-0.95)**	0.56 (0.38-0.84)**
Conflict	1.17 (0.85-1.60)	1.16 (0.76-1.78)	1.08 (0.73-1.61)	0.43 (0.27-0.68)**	0.53 (0.29- 0.95)**	0.27(0.11-0.68)**

[1]n = 404; [2]n=280; [3]n = 124

** p value < 0.05; *p value < 0.10

All model adjusted for respondent's age, education, religion, parity, wealth-quintile, and spousal age difference