Reducing the prevalence of induced abortion in developing countries, usually consequent to unintended pregnancy, is vital in lowering the likelihood of unsafe abortion – a rampant event in these regions.(WHO, 2008). An estimated 22 million abortions continue to be unsafe each year, resulting in the death of an estimated 47 000 women (WHO, 2008). In 2008, 38 million abortions were performed in developing countries (compared to six million in developed countries), while more than 97% of abortion in Africa were unsafe (Sedgh G. et al, 2012) A woman is also more likely to have an abortion if she is from a developing region.(Sedgh G. et al, 2012)

It is known that to ascribe that a pregnancy is "wanted" or not is usually determined by relationship factors, for example, when relationships are unstable. In the same vein, the decision to resolve the unwanted pregnancy involves the couple's connection to each other (Coleman, 2007). Coleman suggested that length of relationship, commitment, trust and open communication are factors which may play a role in the association between abortion and relationship quality (Coleman 2007). The mechanisms through which relationship quality may influence a woman's procuring abortion may be glimpsed from the observation that a woman's desire to have a baby with her partner is not fixed, but known to change over time depending on relationship and life circumstances. For instance, the perceived emotional and sexual benefits of sexual relationships may outweigh the goal of averting conception, even when child bearing is wholly unintended (Higgins, et al, 2008). On the other hand, women in unpredictable relationships may be less likely than others to plan sexual intimacy, and often time may not be prepared with a method (Glei, 1999), therefore having greater risk of unintended pregnancy and thus, in the relationship context, more likely to opt for abortion.

A substantial number of studies have examined the effect of abortion on spousal relationship quality and abortion (e.g. Coleman, et al, 2009; Barnett, et al, 1992; and Bianchi-Demicelli F, et al, 2002),

however, the reverse role played by spousal relationship quality, especially through its dimensions, on the decision to procure induced abortion is scarcely explored, particularly in Africa. In order to curb the menacing trend of abortion in this part of the world, there is a need to understand in more details the primal areas of spousal relationship which are related to, and are likely to determine, the choice of inducing abortion. This paper aimed to assess the influence of certain dimensions of relationship quality on abortion procurement.

Methods

Data source

Data was from the baseline round of the Family Health and Wealth Study (FHWS) 2010, a study following up a cohort of at least 500 peri-urban families in nine different sites in China, Egypt, Ethiopia, India, Ghana, Malawi, Nigeria, and Uganda. The FHWS aims to examine individual- and family-level health and economic consequences of family size. The data used for this paper is that of the FHWS site in Ipetumodu, a peri-urban community located in Osun State, South West of Nigeria, where 783 households were successfully interviewed out of the 800 eligible couples randomly selected. The residents of Ipetumodu are largely of Yoruba ethnicity, one of the three major tribes in Nigeria. The instruments used included a male questionnaire and female questionnaire where questions relating to measures of relationship quality and reproductive health as well as other relevant variables were asked each couple.

Study Participants

This study was based on 763 women ever pregnant, married or living together with their partners. The women were 15-49 years of age, and their spouses, 18-59 years.

Outcome measure

The main outcome of interest is having ever had an abortion.

Main Explanatory Variables

The main explanatory variables were four dimensions of marital quality namely: trust, commitment, satisfaction and communication, which were derived using items from the Larzelere's Trust (Larzelere, 1980), Spanier's Satisfaction (Spanier G, 1976), Sternberg's Commitment (Sternberg R., 1986), and Heavey's Constructive Communication (Heavey, et al, 1996) scales, respectively. Factor analysis was done to check the factor structure of original scales in order to identify items to remain in the final scales i.e. those loading highly on the first extracted factor, so as to obtain high internal consistency reliability of the respective scales using the Cronbach's Coefficient Alpha. The choice of the number of factors to extract was based on the Scree plot and factor rotation was done using the Varimax method. Items with loadings less than 0.4 were eliminated. The remaining items were summed up separately for the couples, thereby deriving respective scores for each scale (the Cronbach's alphas ranging from 0.69-0.96) which were then dichotomized into 2 categories using the respective median scores. Scores above and below (or equal) to the median were categorized as "1" (high on the particular relationship dimension) and "0" (low on the particular relationship dimension), respectively, and separately for each partner. These new binary variables were thereafter combined for each couple as composite variables as an overall measure comprising of both the relationship perceptions of the husband and the wife together. This was done by computing a final variable (for each of the four relationship dimensions) having three categories with one category consisting of couples both being "high" (both having a positive level on the particular dimension) , a second with both being "low" (both having a negative level on the particular dimension), and a third category

consisting of those couples where one or the other is “high” or “low” (at least one partner is having a positive level on the particular dimension)

Other Independent Variables

The other covariates considered include the woman’s education, the woman’s education vs man’s education - a derived variable depicting differences in couple’s level of education, wealth index – computed from household assets using principal component analysis (Filmer & Pritchett, 1998), the employment status for each partner, parity, age difference between the couples, the woman’s age, duration of relationship, difference in religion, gravidity, number of children desired by each partner, preference of more male children over girls for each partner, and contraceptive use.

Missing Data

In order to minimize bias due to missing observations, Multiple Imputation by Chained Equations (MICE) method was employed to manage variables with missing values, using an implementation of MICE in Stata (StataCorp. 2009) known as ice (imputation by chained equations). (Royston, 2009) Multiple imputation is expected to ensure more efficient parameter estimates in the final regression analyses thereby providing for more valid inferential conclusions. Non-responses were assumed to be missing at random (MAR), thus the missing mechanism of the data was ignorable – a prerequisite for multiple imputation method.

Data Analysis

Univariate analysis was carried out to explore the data, while associations between categorical variables and quantitative variables were compared using chi-squared test and Student t-test, respectively. Spearman correlation was used to check for highly correlated independent variables in

order to avoid multicollinearity by removing such variables from the logistic regression models. The individual and combined effects of the four dimensions of relationship quality on abortion risk were analyzed using five logistic regression models, adjusting for known covariates from literature. All data management and analysis were done using Stata version 12

Results

Out of the 763 women ever pregnant, 60 (7.9%) have had an abortion. Trust and communication were significantly associated with abortion at the bivariate level with 10.8% of couples of whom neither trusts the other having had abortion, compared to 5.7% of those trusting each other (p-value = 0.07), and 12.4% of couples of whom neither communicates having had an abortion, compared to 5.3% and 7.3% of couples where one partner communicates and both couples communicate, respectively (p-value=0.01). After adjusting for covariates, only communication – at least one partner communicating compared to couples where neither communicates - was a significant predictor of abortion (OR-0.41; p-value, 0.01 & OR-0.46; p-value-0.03, for the model having only communication as a measure of relationship quality, and the model having all dimensions included, respectively.

Conclusion

The study showed that communication between couples is an important dimension of relationship quality for reducing the risk of a woman procuring abortion in the study population. Programs for enhancing marital relationship quality should therefore be advocated and developed, to improve couple's communication in order to impact on the reduction of abortion procurement in the event of an unwanted pregnancy.

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Table 1: Description of Variables

Variables	Description	Type of variable
Outcome		
Ever had abortion	Yes	Binary
	No	
Main explanatory variables (measures of relationship quality)		
Commitment	Both partners are committed	Categorical
	Only one partner is committed	
	Neither partner is committed	
Trust	Both partners trust each other	Categorical
	Only one partner trusts the other	
	Neither partner is committed	
Satisfaction	Both partners are satisfied	Categorical
	Only one partner is satisfied	
	Neither partner is satisfied	
Communication	Both partners communicate	Categorical
	Only one partner feels the couple communicates	
	Neither partner communicates	

Table 2: Other Independent Variables

Variable	Description	Type
Wife's age	15-24; 25-34; 35-49	Categorical
Wife education	None/primary education; Secondary education; Post secondary education	Categorical
Wife versus husband education	Couple have same education; husband has more education; wife has more education	Categorical
Wife's employment status	Daily laborer/domestic worker; Salaried worker; Petty trader/marketing; Others/Unemployed	Categorical
Wealth quintile	Lowest; Lower; Middle; Higher; Highest	Ordinal categorical
Age difference between couple	Discrete quantitative	Quantitative
Length of relationship (years)*	Discrete quantitative	Quantitative
Parity	1-2; 3-4; >=5	Categorical
Gravidity *	1; 2-5; >=6	Categorical
Number of children desired by wife	1-3, 4-5, >=5	Categorical
Number of children desired by husband	1-3; 4-5; >=5	Categorical
Wife prefers boys to girls	Yes; No	Binary
Husband prefers boys to girls	Yes; No	Binary
Couple have same religion	Yes; No	Binary
Wife uses contraceptive	Yes; No	Binary

*Not used in regression models because of multicollinearity

Table 3: Adjusted* Odds ratios (OR) and 95% confidence intervals (CI) of measures of relationship quality as predictors of abortion

Explanatory Variables	Dependent variable: Ever had abortion =1, Never had abortion =0									
	Model 1		Model 2		Model 3		Model 4		Model 5	
	OR	p-value	OR	p-value	OR	p-value	OR	p-value	OR	p-value
Commitment (RC = Neither partner is committed)	1.00								1.00	
Only one partners committed	1.12	0.74							1.29	0.47
Both partners are committed	0.53	0.17							0.65	0.40
Trust (RC = Neither partner trusts)			1.00						1.00	
Only one partners trusts the other			0.54	0.07					0.58	0.12
Both partners trust each other			0.51	0.12					0.61	0.31
Satisfaction (RC = Neither partner is satisfied)					1.00				1.00	
Only one partner is satisfied					0.62	0.19			0.70	0.33
Both partners are satisfied					1.41	0.38			1.67	0.22
Communication (RC = Neither partner communicates							1.00		1.00	
Only one partner feels the couple communicates							**0.41**	**0.01**	**0.46**	**0.03**
Neither partner communicates							0.59	0.20	0.74	0.49

*Adjusted for wife's age, education, employment status, wife versus husband education, wealth quintile, age difference, parity, number of children desired by wife, number of children desired by husband, wife' preference for boys, husband's preference for boys, contraceptive use, difference in religion

RC = reference category; emboldened figures are significant at $p < 0.05$