A MULTIVARIATE APPROACH TO DETERMINANTS OF CONTRACEPTIVE USE AMONG MIGRANTS AND REFUGEES IN BOTSWANA

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Introduction

Botswana has continued to enjoy a level of economic and social stability that is unique among sub-Saharan African countries for over four decades of its independence. Its impressive economic performance and political stability makes Batswana (Botswana citizens) refer to it as the 'Gem of Africa'.[1] These attributes have resulted in Botswana attracting immigrants and paying host to refugees from different countries of Africa, Asia, Europe and the Americas (in particular, the Caribbean). The high influx of immigrants and refugees has occurred concurrently with the soaring rate of HIV infection in which, Botswana, with nearly 40% of the population in the reproductive-age being infected, is now one of the most affected nations of the world. Unfortunately, there is no information to date on the extent to which immigrants and refugees in the country use reproductive health care services (including contraceptive services) and those targeting HIV as well. This study investigates those factors that determine non-citizens' use of contraceptive services despite its availability in Botswana and as Batswana continue to enjoy these services free of charge in the public health system

Migrants and refugees represent a good proportion of Republic of Botswana's population. The 2001 Population and Housing census put the population of migrants and refugees in Botswana at 60,716 out of a population of 1.68 million people.[2] Immigrants in Botswana reside mainly in towns and in mining areas, while majority of refugees are held in the Dukwi Refugee Camp, located 130km from Francistown, Botswana's second largest city. The number of asylum-seekers and recognized refugees (majority from Namibia, Angola and Somalia) at the camp at the time of the study was estimated at 2,000.

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The 1996 Botswana Family Health Survey III (BFHS III) reported that Batswana women had a total fertility rate (TFR) of 4.3 births per woman; 97.4% had knowledge of a contraceptive; 96% knew at least one source of contraceptive method; 69.8% had ever used a method; and 41.7% were currently using a family planning method and modern contraceptives.[3] Condom use among the young between 15-24 years in Botswana was 72.4% and 49% among women aged 25-49 years.[4] To date, there is no information available on the contraceptive use of migrants and refugees in Botswana. This study investigates those factors that determine non-citizens' use of contraceptive services.

Family planning services (including contraceptive services) are known to be available most of the time at all the three levels of the Botswana Ministry of Health system, namely hospitals, clinics, and health posts. The country relies on its extensive system of health posts and health centres to provide contraceptives with emphasis on the benefits of child spacing. However, clinical methods (IUD and injectables) are not normally available at the health post level where family welfare educators and enrolled nurses are the only staff. Access to contraceptives is excellent given that over 85% of the population resides within 15 kilometres of one of the health care facilities providing these services.[5] Unlike in most other African countries where such factors as lack of Government commitment, medical barriers, socio-cultural barriers and lack of resources hamper access to contraceptive use, Batswana enjoy excellent support from the government, probably because of the high HIV/AIDS prevalence.[6] It is quite easy for both the married and unmarried to access contraceptive services from the health care system at no cost to them.[7]

Despite this dominance of contraceptive services, the research report on which this article is based reported that only 37.7% of the female migrants and refugees (29.1% migrants, 5.6% refugees and 3% unclassified) in Botswana were currently using contraceptives, in a country where contraceptive prevalence is 48%.[7,8] This differential in contraceptive use between the local population, and the migrants and refugees in a country with excellent primary health care system calls for a thorough understanding of the factors that influence contraceptive use among migrants and refugees contraceptive use in Botswana and how these factors affect them.

A theoretical framework has been proposed within which the study is perched, underlining the growing xenophobia in Botswana and recent policy changes in the country that impinge on contraceptive use by foreigners.

A number of factors are known to influence the use or non-use of contraception. They include lack of government commitment and support to family planning programmes, medical barriers, socio-cultural barriers, lack of adequate resources, non affordability, accessibility and availability of family planning services. Knowledge of contraceptives, educational status, woman's age as well as marital status, employment status, partnership status, family disapproval of contraception, communication between partners, breastfeeding, postpartum abstinence practices, risks associated with use of contraceptives and desire to space out childbirths and to avoid being pregnant are yet other factors.[5,6,9-17]

The situation of migrants and refugees in Botswana has to be premised on some international conventions which the country has signed and ratified given its observance of democratic principles and heavy dependence on immigrant workforce and its hosting of refugees from different African regions. For example, the International Convention on the Protection of the Rights of All Migrant Workers and

Members of Their Families, which entered into force in 1990 following its signing by the requisite number of the United Nations member states. The human rights paradigm guarantees legal protection of individuals and groups against actions that interfere with fundamental freedoms and human dignity (OHCHR: 3) and encompasses a full range of civil, cultural, economic, political and social rights that apply universally.[16] In the health sphere, "denial of these rights carries a high risk that non-nationals will be socially excluded and unable to benefit from health services, with potentially severe consequences both for themselves and for their host and home communities" (WHO, 2003).[18] Where xenophobia reigns and government health policies are biased against foreigners, as has been the case in Botswana since 2000[19-23] it is inevitable that the health needs of the latter are heavily compromised. The Article 12 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) provides the most authoritative articulation of the right to health in international human rights law (WHO, 2003),[18] implies that governments of the host countries are obliged to treat both citizens and foreigners in the same manner. Since the 1990s, the international community has made spirited efforts to ensure the observance of migrant's rights, not to mention the rights of refugees who are compelled by circumstances beyond their control to flee their countries of habital residence.

This paper is a more rigorous analysis built upon an earlier paper, which adopting only a descriptive analysis of factors in play reported a substantial gap between contraceptive knowledge and use, differentials in contraceptive knowledge and use among migrants and refugees relating to such factors as accessibility and availability of contraceptives and the respondent's highest educational qualifications, marital status, age of woman and desire for more children.[6] The study found that the youngest age group, below 20 years, among the female migrants and refugees had higher knowledge of pills and the least knowledge of condom while those in age group 30-39 years had nearly as much knowledge of pills as the youngest age group, but more knowledge of condoms. Unfortunately, the descriptive analysis did not allow an evaluation of the role played by the explanatory variables on the use of contraceptives. To do so, this article employs a logistic regression model that allows investigation of the joint and partial effects of the factors that affect contraceptive use among the migrants and refugees in Botswana. The model provides a framework to test one notable hypothesis: immigrant and refugee women's knowledge of contraceptives, marital status, educational status, employment status, age and desired fertility as well as two supply factors-contraceptive accessibility and availability- significantly affect the probability of their using the preferred contraceptive method. In addition, an effort is made to verify the impact of some variables on contraceptive use before and after including the other variables in the model.

The larger study on which this article is based was carried out in 2005-2006 in the wake of policy changes that curbed the fringe benefits enjoyed by, and growing xenophobia toward foreigners. These dramatic changes for the worse in foreigners' estimation included : a shift from 'open' migration policy when recruitment of foreign workers was aggressively pursued, to a more restrictive immigration policy when immigration control has become the norm; the country's localization policy which emphasizes replacement of foreign workers with locals; and withdrawal of fringe benefits such as competitive salaries, subsidized housing, cars, health insurance and free education for expatriate children.[1] Added to this tally are the withdrawal of "contract addition" which stabilized expatriate earnings, taxation of the already reduced end-of-

contract gratuity and diminished appreciation of expatriates, making the problems confronting immigrants and refugees become more intractable. Clearly, investigation of the changing policy terrain and other changes must have impacted foreigners' health status and status and access despite the country's abundant health facilities.

The present study was conducted to determine the factors that affect contraceptive use from the Botswana's health care system by migrants' and refugees' and to make suggestions based on the findings to the Ministry of Health, Botswana on measures that could be adopted to improve contraceptive use among the migrants and refugees in Botswana.

Methodology

The 2005-2006 survey on which this paper is based was carried out by the authors among the 60,716 legal migrants and refugees in Botswana. Using Creative Research Systems,[24] and with 95% confidence level (allowing an error of plus or minus 3%), a sample size of 1205 legal immigrants and refugees was selected for the study. The study ensured that the list of individuals sampled was slightly more than the number required statistically. These additional individuals were substituted for those on the primary list who could not be located or who declined to participate in the study.

The proportionate stratified random sampling method was employed in this study with the population divided into 23 strata (health districts in Botswana). This method ensured better representation of all sub-groups of the population in the sample and more statistical precision than the simple random sampling. The total sample of migrants and refugees were allocated to the 23 districts of Botswana in proportion with the population and distribution of migrants and refugees in the districts. The simple random sampling method was then used in selecting the number of sampled individuals for the study from the 23 districts.

Trained research assistants appointed for fieldwork contacted respondents either at their home or at the workplace. They explained the purpose and nature of the study to give the sampled individuals an opportunity to either accept or decline participating in the study. For those who consented, the research assistants administered the questionnaire (in English) because the respondents were expected to be proficient in English language. Code numbers were assigned to each questionnaire as a way of ensuring confidentiality. However, in cases where the respondents complained of not having time to sit with the Research Assistants to complete the questionnaires, the questionnaires were self-administered and collected later as mutually agreed by the particular respondents and Research Assistants. The total number of migrants and refugees that responded were 1188 (652 male and 536 female migrants and refugees) giving a response rate of 98.6%. In order to conform to international standards and because of the sensitive nature of the questions, only migrants and refugees who were 18 years and above were interviewed.

Study limitation

The study, however, failed to examine contraceptive use among the refugees as a separate group because the Wald statistic did not report significance for most variables in this group of respondents. The Wald statistics performs poorly when the cell frequencies on which the models are fitted are very small. This might be responsible for the inability of the test to detect any significant variables for the

refugee analysis. This an area yearning for further research, hopefully with increased sample size.

Analysis

The data being analysed in this paper was from the responses of female migrants and refugees (536) on their demographic characteristics, whether the women were currently (within one month to the time of the survey) using or not using a particular contraceptive method, contraceptive knowledge, need for more children, and perceptions on availability and accessibility of contraceptive methods from Botswana's health care systems. The logistic regression, a multivariate statistical method was used to predict a dichotomous dependent (response) variable "using contraceptive method", from a set of multiple predictor variables which were either ordinal or nominal with the categories coded using dummies. The response variable was coded such that the higher value indicated that contraceptives were being used. The Statistical Package for Social Sciences, SPSS, version 14 was used for the analysis. Logistic regression models were produced in tabular forms for each independent variable and test of significance established.

In order to limit our analysis to the relevant variables that influence contraceptive use, a preliminary investigation was carried out using the proposed logistic regression model. All the variables that showed non significant effect ($p > 0.05$) were eliminated leaving the variables knowledge, availability and accessibility of contraceptive method, highest educational attainment, marital status, age of respondent, employment status and need for more children, which were highly significant ($p < 0.05$) predictors of contraceptive use. Our analyses and conclusions will, therefore, be based on these variables whose labels and categories are shown below.

Factor	Label	Levels
Contraceptive use	C	High, Low
Knowledge	Kn	High, Low
Availability	Av	Never, Sometimes, Always
Accessibility	Ac	Never, Sometimes, Always
Highest Educational qualifications	Ed	Primary Certificate, Secondary/Diploma Certificate, Professional Certificate, Degree
Marital Status	M	Married, Consensual union, Separated, Divorced, Widowed
Age	Ag	Below 20, 20-29, 30-39, 40-49, 50+
Employment Status	Es	Employed, Unemployed (but seeking employment, Unemployed (but not seeking employment)
Need more children	Nm	High, Low

Model specification

The logistic regression model has the coefficients such as β_0 = Constant; β_1, β_2, ...β_i are logistic regression coefficients. The logistic regression coefficients β_i, i = 1, 2 .....12 can be interpreted as the change in 'log odds' associated with one unit change in the independent (explanatory) variable. The logistic regression coefficients are usually expressed as logarithms to enable their relative effects on the probability of an event occurring to be assessed easily. It computes a transformed value **Exp** (β_i), where **Exp** represents the base of the natural logarithms (approximately 2.718). If β_i is positive, then Exp (β_i) will be greater than 1 showing that a unit change in the independent variable means that the odds are increased that the event will occur. Similarly, when β_i is negative, the value of

Exp (β_i) will be less than 1 showing that a one-unit change in the independent variable means that the odds are decreased that the event will occur. When β_i is zero, the value of Exp (β_i) is 1, indicating that the odds are unchanged for a one unit change in the independent variable.

Interest is usually to test the hypothesis, $H_0: \beta_1 = \beta_2 = \ldots\ldots = \beta_i = 0$ of the non significance of the logistic model using the Wald statistic, $\left(\frac{\hat{\beta}_i}{Standard\ error\ of\ (\hat{\beta}_i)}\right)^2$, which is distributed as chi-square with one degree of freedom (χ_i^2) while the goodness of fit of the models will be tested using the likelihood ratio statistic, -2LL (-2 times the log of the likelihood). The likelihood is known as the probability of the observed results given the parameter estimates. A good model results in a small value of -2LL. Thus, if the model fits the data perfectly, the likelihood is 1 and -2LL will be zero (25, 26).

In subsequent sections, the paper considered the fitting of the logistic regression models to the responses of the female migrants and refugees so as to determine those factors that significantly affect their contraceptive use.

Results

Contraceptive use and knowledge

Knowledge of contraceptive methods and where the methods can be obtained are very crucial in the decision to use a contraceptive method and the preferred method to use. Inadequate knowledge of contraceptives as well as factors such as no access to contraceptives and harmful effect of contraceptives have been found to be highly instrumental to non-use of contraception.[27-29] In the same vein, Fantahun, et al,[30] reported that knowledge of pills and positive attitude to contraception were significantly associated with modern contraceptive use and recommended the inclusion of family life education, counseling and clinical services of family planning in high schools and places where adolescents gather for recreation and other purposes.

In this study, female migrants and refugees were asked to indicate for each contraceptive they knew whether they had ever used or are currently using a method of contraception. Their responses were either 'yes', if they had used or are currently using a method or 'no', if they had not. The Table 1 shows results of the logistic multiple regression models for the female migrants and refugees, with log odds of contraceptive use as the dependent variable and knowledge (yes or no) of different contraceptives as the explanatory variables.

The table summarizes the logistic regression models of contraceptive use against knowledge of contraceptives for (i) the combined responses of female migrants and refugees, (ii) the responses of female migrants only, and (iii) the responses of female refugees only. The significance probabilities are based on the Wald's test.

For the combined female migrants and refugees, the results show that only knowledge of pills, IUD, condom and diaphragm significantly predict the log odds of contraceptive use with those who know the IUD and condom about three times more likely to use them than those who do not know these contraceptives. In the case of female migrants only, the significant predictors were knowledge of injectables and Norplant with those who had knowledge of injectables being about six times more likely to use this method than those who do not use this method. Only knowledge of diaphragm was significant for female refugees, knowledge of contraceptive being inversely proportional to use. The overall model for the combined female migrants and refugees was highly significant ($p = 0.000$).

TABLE 1

Logistic regression model of contraceptive use against knowledge among female migrants and refugees

Knowledge of Contraceptive in Botswana health system	Female migrants and refugees			Female migrants only			Female refugees only		
	B	Sig.	Exp(B)	B	Sig.	Exp(B)	B	Sig.	Exp(B)
Pill	-0.702	**0.029**	0.496	-0.435	0.327	0.647	-0.871	0.304	0.419
IUD/Loop	1.192	**0.000**	3.295	-0.257	0.657	0.773	0.304	0.711	1.355
Injectable	0.606	**0.045**	1.833	1.787	**0.000**	5.974	1.116	0.234	3.051
Foam/Foamy/ ablets/Jelly	0.263	0.406	1.301	0.491	0.377	1.634	2.179	0.135	8.839
Condom	0.984	**0.001**	2.675	0.817	0.056	2.265	1.039	0.143	2.828
Tubal Ligation	-0.322	0.389	0.725	0.115	0.853	1.122	-2.204	0.188	0.110
Vasectomy	-0.154	0.715	0.857	1.054	0.136	2.868	1.252	0.384	3.497
Norplant	0.508	0.107	1.661	-1.381	**0.015**	0.251	1.795	0.063	6.019
Diaphragm	-0.764	**0.038**	0.466	-1.197	0.069	0.302	-3.947	**0.013**	0.019
Rhythm/Calendar method	-0.287	0.497	0.751	0.317	0.668	1.374	-0.711	0.613	0.491
Periodic abstinence	0.200	0.668	1.221	0.437	0.544	1.548	2.579	0.139	13.187
Withdrawal	-0.212	0.579	0.809	-0.293	0.599	0.746	-1.074	0.403	0.342
Constant	-1.215	**0.000**	0.297	-1.336	**0.000**	0.263	-0.958	0.052	0.384

(Reference category = No contraceptive knowledge)

Subsequent analyses were limited to those variables whose coefficients were significant in the prediction of the dependent variable (log odds of contraceptive use). This was achieved by using the forward likelihood selection method, a procedure that eliminates a variable once it is found not significant.

Contraceptive use and availability

Although contraception is crucial in the maintenance of a woman's health, her ability to obtain certain contraceptives from the facility where she obtains her primary care is largely influenced by the availability of the contraceptive method. Analysis of World Fertility Survey data from five countries—Colombia, Costa Rica, Korea, Malaysia and Nepal showed that the availability of contraceptive services and supplies is a major determinant of use. In Nepal, for instance, where few women knew where to obtain supplies only two percent were contracepting. In Costa Rica, where almost all married women knew an outlet nearby, 53 percent used effective methods.[31]

In our study, availability of contraceptive methods was measured by the migrant and refugee woman's perception of which contraceptive methods were available in the health care system in Botswana. They were asked to indicate their perceptions of the availability of contraceptives from the Botswana healthcare system based on a four-point scale, namely: 1 = Never; 2 = Sometimes; 3 = Always and 4 = Don't know. A logit model was fitted to the responses tabulated against contraceptive use and analysed, using the forward likelihood selection procedure (Table 2).

TABLE 2

Logistic regression model of contraceptive use against contraceptive availability in healthcare systems

Contraceptive available in healthcare system	Female Migrants and Refugees				Female Migrants Only			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Pill		**0.00**				**0.01**		
Sometimes	1.99	0.61	**0.00**	7.33	1.92	0.70	**0.01**	6.82
Always	0.88	0.42	**0.03**	2.41	0.67	0.41	0.10	1.96
Don't know	0.32	0.49	0.52	1.37	-0.22	0.48	0.65	0.80
Injectables			**0.00**				**0.00**	
Sometimes	-2.27	0.53	**0.00**	0.10	-2.28	0.59	**0.00**	0.10
Always	0.07	0.50	0.89	1.07	0.03	0.53	0.96	1.03
Don't know	-0.86	0.53	0.11	0.42	-0.28	0.56	0.62	0.76
Foam			**0.00**				**0.00**	
Sometimes	0.43	0.49	0.39	1.54	-0.17	0.55	0.76	0.85
Always	1.13	0.52	**0.03**	3.11	0.87	0.55	0.12	2.38
Don't know	-0.59	0.48	0.22	0.56	-0.88	0.54	0.10	0.42
Vasectomy			**0.00**					
Sometimes	-1.62	0.47	**0.00**	0.20				
Always	-1.40	0.52	**0.01**	0.25				
Don't know	-0.71	0.54	0.19	0.49				
Withdrawal			**0.03**					
Sometimes	0.05	0.47	0.91	1.05				
Always	1.00	0.40	**0.01**	2.73				
Don't know	1.01	0.48	0.04	2.75				
Periodic abstinence							**0.04**	
					-1.30	0.62	**0.04**	0.27
					-1.27	0.50	**0.01**	0.28
					-0.38	0.56	0.49	0.68
Constant	-0.16	0.39	0.69	0.86	0.75	0.33	0.02	2.13

No variables were significant for the female refugees
(Reference category = Never)

The variables that were found significant in predicting contraceptive use for the female migrants and refugees were pills, injectables, foam, withdrawal and vasectomy, while those that were significant for the female migrants only were pills, injectables, foam and periodic abstinence (Table 2). The only variable that was significant for the responses of female refugees only was injectables (Table not shown).

In addition, the results presented in Table 2 show that those migrants and refugees who indicated that pills, injectables, withdrawal and foam tablets were always available in the Botswana health system were more likely to use the contraceptives than those who said they were never available ($1.03 \leq Exp(B) \leq 3.11$). However, for vasectomy and periodic abstinence, those who said they were always available were

less likely to use them. Those who indicated that pills were sometimes available, the usage rate were about seven times over and above those who said pills were never available.

The implication of this finding is that those female migrants who use pills, injectables and foam tablets are utilizing extensively the services of the Botswana health care system. On the contrary, women who knew that vasectomy and periodic abstinence were sometimes or always available in the healthcare system were unlikely to be making use of these services from the health care system. Thus although always available, the women may have preferred to seek for these services outside the Botswana health system.

Contraceptive use and accessibility

Accessibility of contraceptives is an important factor in use of family planning services. Thang and Anh,[32] showed that ready access to any source of family planning significantly reduced nonuse of modern methods (odds ratio, 0.6) and current use of traditional methods (odds ratio, 0.6). Access to contraceptives is enhanced by expanding the types of places users or clients can obtain the services, namely public hospitals, clinics and health posts, private medical facilities, pharmacies, convenience stores, malls and markets, as well as diversifying methods and reducing cost of contraceptives.[10,13,33] Entwisle et al. (1984) showed that a woman who has reached her family size target should be more likely to use contraception if a programme outlet providing services is nearby than if the outlet is some distance away. Thus, close proximity of family planning outlet was associated with a difference in prevalence of about 27 percentage points in that paper.

This study sought the perception of female migrants and refugees regarding accessibility of contraceptive services from the Botswana healthcare system. Once again, their responses were based on a four-point scale: 1 = Never; 2 = Sometimes; 3 = Always; 4 = Don't know. Their responses were cross-tabulated with the variable "contraceptive use" to determine how accessibility of each contraceptive method influenced its use. Table 3 summarizes the variables that were significant in predicting contraceptive use for the female migrants and refugees, using the logistic regression analysis based on the forward likelihood selection procedure.

The table shows that accessibility of pills, foam tablets, condom, tubal ligation, vasectomy, Norplant and diaphragm do significantly predict the odds of contraceptive use ($0.000 < p\text{-value} < 0.020$). For the pills, condom, vasectomy and diaphragm, those who indicated that there were always accessible were between 2-10 times more likely to use them than those who said they were unaccessible. Thus, usage of contraceptives increased with accessibility. Yet, the reverse was the case for the more complicated contraceptives, tubal ligation and Norplant. It can also be observed that the likelihood of usage of the vasectomy and diaphragm was over three times those of pills and condom because women do not have trust in these contraceptives for family planning purposes but would prefer the more sophisticated contraceptives with greater reliability and more affordability[10,34] gave the failure rate of condom in preventing pregnancy in Spain (in 2001), Switzerland (in 1997) and Slovenia (in 1995) as 29.5%, 16.1% and 14.0% while the corresponding percentages for sterilization were 11.8%, 18.8% and 1.0%, respectively.

Contraceptive use and sociodemographic characteristics

This section analyses the extent to which respondents' background characteristics influence contraceptive use. Five background characteristics are considered, namely, the highest educational qualification, marital status, age, employment status and desired fertility.

Highest educational qualification

Education has been shown to increase awareness and knowledge of contraceptive methods and subsequently their use.[35] It can help to dispel some of the culturally built-in beliefs about human reproduction being a natural process that need not be interfered with artificially.[6] An earlier work, found that educational qualifications of migrants and refugees do influence their contraceptive knowledge with the most highly qualified men and the least qualified women having higher knowledge of the pills and condom.[9] The World Bank Report[13] revealed that contraceptive use increases faster in countries where women are highly educated as it contributes to delayed marriage, higher female status and reduced infant mortality. In this report, however, the highest educational qualifications of the respondents were tabulated against contraceptive use so as to study the direct impact of education on contraceptive use.

The results presented in Table 4 suggest that the highest educational qualification significantly predicts contraceptive use. The female migrants and refugees with primary school certificate have lower contraceptive use than those with no qualifications. The later might sound contradictory but corrobates the findings of previous contraceptive use studies in much of the developing world. Besides, those with secondary school certificate/diploma, professional certificate and degree were about 1.5 times, 2.4 times and 1.2 times, respectively, more likely to use contraceptive methods than those without any qualifications. Thus, although the results do not show any direct variation between contraceptive use across different educational qualifications, nevertheless, they underline the contribution of higher educational qualifications in improving contraceptive use: indeed those having post primary qualifications are more likely to use contraceptives.

TABLE 3

Logistic regression model of contraceptive use against contraceptive accessibility in Botswana healthcare systems

Contraceptive accessibility from Botswana healthcare	Female migrants and refugees				Female migrants only			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Pill			**0.00**					
Sometimes	0.60	0.60	0.32	1.83				
Always	0.56	0.47	0.24	1.75				
Don't know	-0.97	0.58	0.09	0.38				
Foam			**0.00**				**0.00**	
Sometimes	0.42	0.57	0.46	1.52	0.20	0.53	0.71	1.22
Always	-0.40	0.50	0.42	0.67	0.79	0.55	0.15	2.20
Don't know	-1.46	0.41	**0.00**	0.23	-1.35	0.41	**0.00**	0.26
Condom			**0.01**					
Sometimes	1.64	0.70	**0.02**	5.14				
Always	0.90	0.53	0.09	2.47				
Don't know	1.80	0.60	**0.00**	6.06				
Tubal Ligation			**0.00**				**0.00**	
Sometimes	-2.19	0.73	**0.00**	0.11	-2.97	0.53	**0.00**	0.05
Always	-3.67	0.94	**0.00**	0.03	-1.05	0.56	0.06	0.35
Don't know	-1.92	0.88	**0.03**	0.15	-0.24	0.43	0.57	0.78

Contraceptive accessibility from Botswana healthcare	Female migrants and refugees				Female migrants only			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Vasectomy			**0.00**					
Sometimes	-1.46	0.62	**0.02**	0.23				
Always	2.26	0.76	**0.00**	9.62				
Don't know	-0.07	1.08	0.95	0.93				
Norplant			**0.01**					
Sometimes	-2.02	0.63	**0.00**	0.13				
Always	-2.08	0.82	**0.01**	0.13				
Don't know	-1.22	0.91	0.18	0.29				
Diaphragm			**0.02**					
Sometimes	1.38	0.87	0.11	3.99				
Always	2.15	0.81	**0.01**	8.58				
Don't know	2.83	0.98	**0.00**	17.01				
Constant	0.17	0.44	0.70	1.19	0.85	0.28	**0.00**	2.34

(Reference category = Never)

TABLE 4

Logistic regression model of contraceptive use against Highest Educational qualifications among female migrants and refugees

Educational qualification	Female migrants and refugees				Female migrants only			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Highest educational qualifications			**0.01**				**0.04**	
Primary certificate	-0.30	0.65	0.64	0.74	-0.41	0.92	0.66	0.67
Secondary certificate / diploma	0.39	0.62	0.53	1.48	0.29	0.88	0.74	1.33
Professional certificate	0.88	0.64	0.17	2.42	0.79	0.90	0.38	2.21
Degree	0.16	0.63	0.80	1.17	0.10	0.89	0.91	1.11
Constant	-0.81	0.60	0.18	0.44	-0.69	0.87	0.42	0.50

(Reference category = No qualifications)

Marital status

Women in legal and consensual marriages often represent the majority of sexually active women. They have greater frequency of intercourse, higher fertility and are exposed to risk of unwanted pregnancies. Inevitably they would be expected to use contraceptives more readily than any other groups of women. It is also well known that in some parts of the world, this group of women need the consent of their partners and in some cases that of the mother-in-law so as to decide on contraception.[6,36,37]

The results reported in Table 5 show that marital status is a significant predictor of contraceptive use with the married migrant and refugee women about 30% more likely to use contraceptives than the single (never married). There is an inverse relationship

TABLE 5

Logistic regression model of contraceptive use against marital status of female migrants and refugees

	Female migrants and refugees				Female migrants only			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
Marital status			**0.04**			**0.02**		
Married	0.25	0.20	0.20	1.29	0.27	0.23	0.23	1.31
Consensual Union	-0.79	0.37	**0.04**	0.46	-1.39	0.51	**0.01**	0.25
Separated	-0.39	0.85	0.65	0.68	-0.89	1.13	0.43	0.41
Divorced	-1.18	0.78	0.13	0.31	-0.89	0.81	0.27	0.41
Widowed	-20.67	20096.49	1.00	0.00	-20.71	23205.42	1.00	0.00
Constant	-0.53	0.16	**0.00**	0.59	-0.49	0.19	**0.01**	0.61

(Reference category = single (never married))

between contraceptive use and marital status for the female migrants and refugees in consensual union, separated and divorced, with these groups being less likely to use contraceptives than the never married. The result confirms the popular belief that contraception should be for the married. For instance, Morrison[36] found that men as well as the midwives at the maternal and child health clinics disapproved the use of contraceptives by the unmarried women for the fear of promiscuity.

Age

Age has been known to be one of the barriers to contraceptive use as many reproductive health providers refuse to serve young women (less than 18 years) or on the other hand young women are afraid or ashamed of going to seek for these services from the hospitals and clinics.[36,38] However, in this era of HIV/AIDS, such discriminatory stance no longer holds. For instance, 72.4% of 15-24 year olds in Botswana are known to have used condom while 89% of this age group who have multiple partners have used condom.[4]

In this study, age of the respondents is shown to be a significant predictor of contraceptive use. Women aged 20-29 and 30-39 years are 6, 9 times, respectively, more likely to use contraceptives. For the older age groups, contraceptive use decreases as the age increases.

TABLE 6

Logistic regression model of contraceptive use against age of respondents

Age (years)	B	S.E.	Wald	Sig.	Exp(B)
			25.87	0.00	
20-29	1.86	0.76	6.06	0.01	6.43
30-39	2.15	0.76	8.04	0.00	8.56
40-49	1.07	0.79	1.84	0.18	2.91
50 and above	-0.15	1.05	0.02	0.89	0.86
Constant	-2.25	0.74	9.17	0.00	0.11

(Reference category = below 20 years of age)

Employment status

Gainful employment when combined with education empower the women economically, delays marriage, can negotiate condom use, decide on the number of children to have and when to have them, and can pay for their desired contraceptive choices.[40] An earlier work from the same data found that about 57% of the female migrants and refugees were employed while 43% were either unemployed and seeking employment or unemployed but not seeking employment.[7] Yet, it is not clear how this distribution of employment status translates into contraceptive use.

The results in Table 7 show that employment status is a significant predictor of contraceptive use. In addition, the employed female migrants and refugees are about 40% more likely to use contraceptives

than the unemployed who are not seeking any employment, whereas those unemployed but seeking employment are 26% less likely to use contraceptives. These results are not surprising since most contraceptive services used by the migrants and refugees in Botswana have to be paid for.[7] To this end, employed persons are more comfortable with paying for contraceptive services that they need. However, those unemployed but seeking employment do not have resources and are, therefore, less likely to meet their contraceptive needs; the use of contraceptives by this group will, predictably be highly restricted.

Table 7

Logistic regression model of contraceptive use against employment status of female migrants and refugees

Employment status	B	S.E.	Wald	df	Sig.	Exp(B)
Employment status	7.86	2	0.020			
Employed	0.33	0.25	1.77	1	0.183	1.39
Unemployed (but seeking employment)	-0.31	0.30	1.06	1	0.304	0.74
Constant	-0.65	0.22	8.74	1	0.003	0.52

(Reference category = unemployed but not seeking employment)

Contraceptive use and desire for more children

One of the major uses of family planning services, in general and contraceptive services, in particular is to enable couples freely exercise their choice of the number of children to have and when to have them. Today, there are several contraceptive options that are open to them ranging from pills to sterilization (male and female), effective contraception or abortion, which is used usually as the last resort.[10] In this study, women were asked to indicate whether they needed more children after their previous pregnancy, as way of determining their unmet need for contraceptives and to find out the likelihood of using contraception.

The analysis reveals that for a unit change in the number of children needed there is a corresponding change of 0.66 in the odds of contraceptive use which is not significant. However, the migrant and refugee women who wanted more children were about 93% more likely to use contraceptives than those who do not want more children (Exp(B) = 1.93). This result is important because it reveals greater need of contraception for child spacing among women of child bearing ages than in avoiding pregnancy. The result corroborates that of a study in Eastern Europe and Eurasia[35] where it was shown that the percentage of women with 3 or more children in Armenia (in 2000) or Georgia (in 1999), Turkmenistan (in 2000), and Azerbaijan (in 2001) who were using contraceptive were over 8 times those with zero number of children who were using contraceptives. In this era of HIV and AIDS, many people adhere to the message of abstinence from sexual activity as a means of avoiding infection with the virus.

Discussion

This article has shown that contraceptive access, availability, knowledge, highest educational qualification, age, marital status, employment status and desire for more children do influence contraceptive use significantly. However, the major appeal of the procedure used in this study lies in its ability not only to detect contraceptive methods that significantly predict usage but also the likelihood of usage of the contraceptive methods. For

instance, the analysis revealed that knowledge of pills, IUD, condom and diaphragm significantly predicted use of these contraceptives with those who know the IUD and condom, being about three times more likely to use them than those who do not have knowledge about them. Knowledge of contraceptives and their uses are usually low among refugees. Abrahams and Hajiyiannis[17] showed that knowledge of contraceptives among the refugees was generally low and tends to be centred on four types, namely, condom (56%), pill (48%), injectables (33%) and rhythm or calendar method (32%). Yet usage was even lower among the refugees (37% for condom and 0-13% for others). Thus empowering contraceptive users with knowledge of the methods, where they can be obtained and ensuring closeness of contraceptive sources to the location where the migrants and refugees live could enhance increased use of the methods.

Another important finding is that availability and accessibility of most contraceptives, not only significantly improve their usage by migrants and refugees but individuals who are sure that the contraceptives are always available and accessible are 2-10 times more likely to use these. Thus, creating awareness on the availability and accessibility of contraceptive services in the Botswana health care system could help the migrants and refugees to regulate their reproductive lives. Haile[6] observed that strong government commitment to family planning programmes, removal of medical and socio-cultural barriers, improved resources and communications can be helpful to improve accessibility and availability of contraceptives and their use.

Education, on the other hand, is crucial in keeping people aware of their contraceptive options, where to find them and how to utilize these options. Juarez and Martin[41] pointed out that education provides women greater confidence to interact with complex institutions, maximizing their ability to benefit from a range of services, including family planning. Through education, women are able to make informed choices on contraception and become more convincing to their partners. As the study has shown higher education increases the likelihood of contraceptive use among those with postsecondary education being more than two times likely to adopt a contraceptive method than those who do not have any qualifications. The migrants and the refugees need to be supported in their effort to use contraceptives, with educational materials and training that would increase their knowledge base on the risks involved in their contraceptive choice. The Ministry of Health in the government of Botswana, and the United Nations High Commission for Refugees (UNHCR) can be of particular help in this regard. Such educational programmes should particularly target the youths, the unemployed, and those women who do not need more children as these groups appear to lag behind in their contraceptive usage when compared with the other groups of migrant and refugee women.

Another closely related issue to education is the employment status of the migrants and refugees which has been shown to significantly influence contraceptive use. In this study, the employed migrants and refugees are shown to be over 40% more likely to use contraception than those unemployed. Employment status can be used as a proxy to economic status especially since respondents are always unwilling to divulge information concerning their income or income status. Juarez and Martin[41] linked educational attainment to wealth and hence to the ability to "afford" more children. In the same manner when women migrants and refugees are in good employment, they are able to pay for their contraceptive services and are also able to take good care of their children.

Government and the private sectors are urged to provide employment to refugees and migrants who have the requisite qualifications just like the local populations.

This study showed that, women between 20-39 years of age are more likely to use contraceptives than younger or older women. These results can be explained by the fact that between 20 and 39 years women in union are more likely to be pregnant or in postpartum period or are seeking to become pregnant, while women aged over 40 years are more likely to avoid becoming pregnant as most of them may have attained their desired family size. Both groups would, therefore, need and use contraceptives. However, the older women 50 years and above are less likely to use contraceptives as majority of them have reached menopause and the probability of their becoming pregnant is close to zero. The results are in line with findings by Kamel and Shah.[38,39]

The study has revealed that women who needed more children were 93% more likely to use contraceptive than those who did not need any more children. The result further suggests that a good proportion of the migrants and refugees have not attained their desired family size and were, therefore, employing the contraceptives for child-spacing. Also, overall use of contraceptives among the migrants and refugees was higher in the lower age groups 20-39. This is usually the age when most women are bearing children. It reinforces our earlier conclusion that the migrant and refugee women were using the contraceptive mostly for child-spacing rather than to stop pregnancy.

Conclusion

Unlike most results reported in literature on contraceptive use in Botswana and its environs, which deal with non-migrant population, this study provides new insights on the subject relating to foreigners in a country with good health infrastructure. Given the growing xenophobia and dramatic changes in government policies over the last few years, migrants and refugees in Botswana require assistance pertaining to improved knowledge of contraceptive methods, their availability as well as accessibility by foreigners in the country's health care system. As noted in the paper, accessibility includes creating avenues and reducing the cost of contraceptives to make them affordable to users. These propositions call for a review of Botswana's health policies and provisions in which perceptions and apprehensions of foreigners require soliciting. In addition, it calls for the Government of Botswana's removal or reduction of any fees attached to these services to make them affordable to the migrants and refugees since their local counterparts who need the same services obtain them free of charge. Government should encourage private sector participation in the provision of family planning services while they give them tax and other financial incentives as a reward. The citing of clinics and hospitals within shorter distances to migrants' and refugees' locations need to be given considerations in health policies and provisions.

These findings provide a framework for future health interventions by Botswana's Ministry of Health and the UNHCR to provide those contraceptive methods as evidenced in the study for utilisation.

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