

## ORIGINAL ARTICLE

# Factors Associated with Failed Contraception in Women Attending Level One Hospitals in Lusaka, Zambia

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## ABSTRACT

**Background:** Unintended pregnancy is a major public health concern due to its impact on maternal morbidity and mortality. Contraceptive failure is one of the causes of unintended pregnancy. Data on factors associated with contraceptive method failure is scarce. This study therefore aimed to explore factors associated with contraceptive failure.

**Methodology:** Unmatched case-control study was conducted at five Level One Hospitals in Lusaka. Convenience sampling was used to enrol 108 cases for whom pregnancy occurred while on a modern contraceptive method and 108 hospital-based controls who were on a modern contraceptive method and not pregnant. Binary and multiple logistic regressions were utilized for assessment of factors associated with failed contraception.

**Results:** Among the 108 cases, 46 (42.6%), 40 (37%), 17 (15.7%) and 1 (0.9%) were on the oral contraceptive pill, injectable, implant and intrauterine device contraception methods respectively while 2 (1.9%) were on barrier and

emergency contraceptive methods respectively. The odds of contraceptive failure when using the oral contraceptive pill was more than 7 times (AOR 7.790, 95% CI 1.210-50.161,  $p=0.031$ ). Those who had contraception failure were more than 3 times more likely to be younger than 30 years old compared to those whose contraceptive method did not fail (AOR 3.559, 95% CI 1.100-11.521,  $p=0.034$  and AOR 3.596, 95% CI 1.354-9.550,  $p=0.010$  respectively for age groups 18-24 years and 24-30 years old). Other factors associated with a higher odds of contraceptive failure were duration of marriage greater than one year, with the highest odds in those married for more than 10 years (AOR 9.744, 95% CI 2.232-42.537,  $p=0.002$ ), higher social support (AOR 2.402, 95% CI 1.085-5.321,  $p=0.031$ ), multiparity (AOR 15.299, 95% CI 3.034-77.151,  $p=0.001$ ), and duration of use of antecedent contraception method of more than 2-3 years (AOR 4.913, 95% CI 1.662-14.526,  $p=0.004$ ).

**Conclusion:** The oral contraceptive pill, younger age, marriage duration of more than one year and contraceptive use more than three years were associated with contraceptive failure. Good messaging and counseling on usage of the oral contraceptive pill are recommended.

**Keywords:** Contraception, Unintended pregnancy, Contraceptive failure.

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## INTRODUCTION

Contraceptive failure is identified as a major source of unintended pregnancy.<sup>1</sup>When used effectively, contraceptives prevent about 200 million unintended births annually, effectively lowering the number of unintended pregnancies.<sup>2</sup>Unintended pregnancies can have many undesirable consequences including unwanted childbearing, recourse to potentially unsafe abortion and increased morbidity and mortality among mothers, new-born babies or both. In 2012 alone, 38% of all unintended pregnancies worldwide ended in an unplanned birth, 13% in miscarriage, and 50% in abortion.<sup>3</sup> Out of about 40 million abortions that occurred, 22 million were unsafe causing the death of 47 000 women<sup>4</sup>with majority in sub-Saharan Africa, accounting for up to 23.5% of all maternal deaths in Malawi.<sup>5</sup>Maternal mortality accounts for 10% of all deaths among women aged 15-49 years in Zambia with Lusaka Province contributing the highest proportion.<sup>6</sup> Further, unsafe abortion accounts for majority of the 6 per thousand women that die from abortion related-complications and over 50% of the cost of post abortion care cost at the University Teaching Hospital in Lusaka.<sup>7</sup> Unintended pregnancies may also have a negative economic impact on the family including the woman's career advancement and ability to care for her children.

The reported use of contraceptives in Zambia increased from 15% in the 90s to 50% in 2018, with the availability of modern methods at low cost rising from 9% to 48% in the same period.<sup>8</sup> Despite these milestones, a considerable number of women report unintended pregnancy while using contraception. In a 2014 study conducted on social and demographic characteristics, unintended pregnancy, contraceptive use, abortion and self-reported HIV status in Zambia and Nigeria, 20.2% of participants reported unintended pregnancy in Zambia, one third of whom were on a modern contraceptive method.<sup>9</sup>

In Zambia, factors associated with contraceptive failure among women are yet to be elucidated. This study aimed to investigate the likelihood of contraceptive failure in women on various

contraceptive methods, and to identify various factors associated with this failure.

## METHODS

This was an unmatched case-control study with a ratio of one case to one control conducted at the five first level hospitals in Lusaka: Chipata, Chilenje, Chawama, Matero and Kanyama hospitals. Cases were women that had fallen pregnant while using a modern contraceptive and hospital based-controls were women that were using a modern contraceptive and were not pregnant. Convenience sampling was used to select 108 cases and 108 controls and information was collected using a provider administered questionnaire which was tailored to the study objectives. Both descriptive and inferential techniques of analysis were applied on the data using SPSS version 22.0. Binary and multiple logistic regressions were utilized for assessment of factors associated with failed contraception. A p value of 0.05 was used to determine significance of findings.

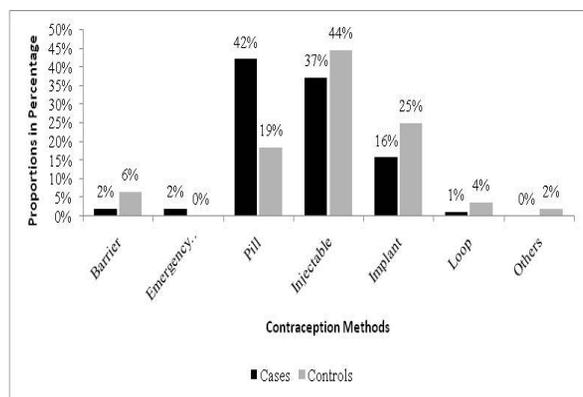
## RESULTS

**Table 1 Socio-demographic and economic characteristics of cases and controls**

Variables	Cases	Controls	Total	p value
<b>Age Group (Years)</b>				0.053
<24	18(16.7%)	15(13.9%)	33	
>24 – 30	40(37.1%)	27(25.0%)	67	
>30 – 35	25(23.1%)	23(21.3%)	48	
>35	25(23.1%)	43(39.8%)	68	
<b>Marital Status</b>				0.040
Single	3(2.8%)	5(4.6%)	8	
Married	103(95.4%)	92(85.2%)	195	
Divorced	2(1.9%)	10(9.3%)	12	
Widowed	0(0.0%)	1(0.9%)	1	
<b>Marriage Duration (Years)</b>				0.005
Unmarried/married<1	3(2.8%)	16(14.8%)	19	
1 – 5	34(31.5%)	25(23.1%)	59	
6 – 10	29(26.9%)	19(17.6%)	48	
>10	42(38.9%)	48(44.4%)	90	
<b>Household Subjective Poverty</b>				0.003
Difficult	40(37.1%)	62(57.4%)	102	
Easy	68(62.9%)	46(42.6%)	114	
<b>Social Support</b>				0.013
Low	22(20.4%)	39(36.1%)	61	
Moderate	45(41.7%)	44(40.8%)	89	
High	41(37.9%)	25(23.1%)	66	
<b>Income Level</b>				0.109
<K1000	28(25.9%)	44(40.7%)	72	
K1000 - K3000	55(50.9%)	49(45.4%)	104	
K3100 - K5000	14(13.0%)	7(6.4%)	21	
K5100 - K10000	10(9.3%)	6(5.6%)	16	
>K10,000	1(0.9%)	2(1.9%)	3	

**Table 2 Medical and gynaecological characteristics of cases and controls**

Variables	Cases	Controls	Total	p value
<b>Medical Condition</b>				0.605
None	88(81.5%)	87(80.6%)	175	
Epilepsy	0(0.0%)	1(0.9%)	1	
RVD	20(18.5%)	20(18.5%)	40	
<b>Number of Pregnancies</b>				0.002
First Pregnancy	3(2.8%)	16(14.8%)	19	
2 or More	105(97.2%)	92(85.2%)	197	
<b>Contraceptive Type</b>				0.001
Barrier	2(1.9%)	7(6.5%)	9	
Emergency Contraception	2(1.9%)	0(0.0%)	2	
Pill	46(42.6%)	20(18.5%)	66	
Injectable	40(37.0%)	48(44.4%)	88	
Implant	17(15.7%)	27(25.0%)	44	
Loop	1(0.9%)	4(3.7%)	5	
Others	0(0.0%)	2(1.9%)	2	
<b>Duration of Contraception</b>				0.031
<6months	5(4.6%)	5(4.6%)	10	
6months - 1year	15(13.9%)	19(17.6%)	34	
>1 - 2years	31(28.7%)	18(16.7)	49	
>2 - 3years	22(20.4%)	10(9.3%)	32	
>3 - 4years	11(10.2%)	17(15.7%)	28	
>4-5years	7(6.5%)	8(7.4%)	15	
>5years	17(15.7%)	31(28.7%)	48	
<b>Contraceptives Knowledge</b>				0.486
None	1(0.9%)	0(0.0%)	1	
Fairly knowledgeable	101(93.5%)	104(96.3%)	205	
Highly knowledgeable	6(5.6%)	4(3.7%)	10	



**Figure 1 Proportions of different contraceptive methods among cases and controls**

**Table 3 Multiple logistic regressions of factors associated with contraception failure**

Variables	Multiple Logistic Regression Results			
	p-value	AOR	95% CI for AOR	
			Lower	Upper
<b>Age Group (Years)</b>				
>18 – 24	<b>0.034</b>	3.559	1.100	11.521*
>24 – 30	<b>0.010</b>	3.596	1.354	9.550*
>30 – 35	0.092	2.003	0.892	4.495
>35	<b>Ref</b>			
<b>Marriage Duration (Years)</b>				
<1	<b>Ref</b>			
1 – 5	<b>0.006</b>	6.788	1.754	26.275*
6 – 10	<b>0.004</b>	7.805	1.920	31.724*
>10	<b>0.002</b>	9.744	2.232	42.537*
<b>Household Subjective Poverty</b>				
Difficult	<b>Ref</b>			
Easy	0.052	1.817	0.994	3.318*
<b>Social Support</b>				
Low	<b>Ref</b>			
Moderate	0.065	2.107	0.954	4.653
High	<b>0.031</b>	2.402	1.085	5.321*
<b>Number of Pregnancies</b>				
First Pregnancy	<b>Ref</b>			
2 or More	<b>0.001</b>	15.299	3.034	77.151*
<b>Contraceptive Type</b>				
Barrier	<b>Ref</b>			
Pill	<b>0.031</b>	7.790	1.210	50.161*
Injectable	0.353	2.406	0.378	15.323
Implant	0.621	1.611	0.243	10.674
Loop	0.986	0.975	0.054	17.672
<b>Duration of Contraception</b>				
<6months	0.139	3.785	0.650	22.062
6months - 1year	0.192	2.004	0.706	5.691
>1 - 2years	<b>0.015</b>	3.037	1.238	7.451*
>2 - 3years	<b>0.004</b>	4.913	1.662	14.526*
>3 - 4years	0.574	1.351	0.473	3.858
>4-5years	0.403	1.707	0.487	5.979
>5years	<b>Ref</b>			

\*Statistically significant at p<0.05. Key: AOR = Adjusted Odds Ratio; COR = Crude Odds Ratio; 95% CI = 95% Confidence Interval; Ref = Reference Category/Indicator

**DISCUSSION**

This study identified use of oral contraceptive pill, multiparity, high social support, age 18-30 years, using a contraceptive method for more than one year and marriage duration of more than one year to be factors associated with contraception failure. Among the 108 cases, 46 (42.6%), 40 (37%), 17 (15.7%) and 1 (0.9%) were on the oral contraceptive pill, injectable, implant and intrauterine device contraception methods respectively while 2 (1.9%)

were on barrier and emergency contraceptive methods respectively.

These findings were comparable to other studies that have investigated contraception failure. Oral contraceptive pill use has been shown to be significantly associated with failed contraception compared to other methods in a multicentre study involving 43 countries.<sup>3</sup> The higher failure rates may be attributed to inconsistency in use due to side effects and failure of user recall. A Zambian study identified younger age, missed OCPs, lack of previous experience with OCP use, and the male partner wanting more children as contributors to unintended pregnancy in OCP users.<sup>10</sup>

The relationship between high parity and contraception failure is similar to studies done in Ethiopia, Brazil and Botswana.<sup>11,12,13</sup> This finding could indicate differential counselling and failure of meeting contraceptive needs of multiparous women as health care providers may concentrate more on women with less child bearing experience. High parity may be seen to be associated with failure because it is more likely to be reported as unintended in studies looking at unintended pregnancy in general without segregating those due to contraceptive failure. In this instance multiparous women may already have completed their families and not looking forward to having more children may report pregnancy as unintended. In contrast, a relationship between low parity and contraception failure was demonstrated by Nigussie *et al.* in Ethiopia who found that gravida one than multigravida was strongly associated with unintended pregnancy.<sup>14</sup>

In terms of younger age being associated with failed contraception, several other studies across Ethiopia, Kenya and Brazil have demonstrated a similar association.<sup>12,13,14,15,16</sup> This finding could be because young people usually use shorter term contraceptive methods with a lower content of care while their older counterparts have a more comprehensive care package and tend to use long acting methods. This age group is also more sexually active and has a

higher fertility rate which naturally increases their chances of getting pregnant.

Shorter duration of using a contraceptive method was associated with unintended pregnancy. Shorter acting methods have consistently proven to have higher failure rates than longer acting methods in different studies across the world.<sup>1</sup> This result may reflect the choice of contraception i.e. shorter acting methods such as pills versus longer acting methods like implants which are less associated with contraceptive failure. Shorter acting methods may also be impacted by poverty and logistical issues such as resources for transport to obtain refills.

This study showed a positive relationship between longer duration of marriage and failed contraception and this has been proven in other studies in Pakistan.<sup>17</sup> This may reflect the influence of the male partner in the contraception decision that women make. Some studies have shown a negative influence in contraceptive uptake and high discontinuation due to male partner influence because many women may depend on their partners for financial and logistical support to access services. Discordant fertility goals and partner objections have been shown to lead to lack of consistency and high failure rates. Being married was shown to have a positive relationship with unintended pregnancy in the DHS analysis from 6 countries.<sup>18</sup> An Ethiopian study however had contradictory findings.<sup>14</sup> Another contradictory finding was that wealth was positively associated with contraceptive failure contrary to other studies. More evidence on this relationship comes from DHS data for 15 countries where poor socio-economic status increased failure rates for oral contraceptive pills and barrier methods compared to methods that were longer acting.<sup>19</sup> The majority of participants were low income earners with less than 9% earning an income that met the Basic Needs and nutrition basket for Lusaka. High social support was associated with failed contraception contrary to what other studies found in the USA.<sup>20</sup>

## CONCLUSION

This study found that failed contraception in Lusaka is associated with multiparity, using oral contraceptive pills, being aged 18-30 years, high social support, being married for more than one year and using a contraceptive method for 1 to 3 years. These results highlight the need to provide effective contraceptive services in form of long acting methods to prevent unintended pregnancy, particularly among younger married women who have high social support.

## DECLARATIONS

For the conduct of this research, approval was obtained from the Biomedical Research Ethics Committee of the University of Zambia School of Medicine (UNZABREC, reference number **REF. No. 362-2019**). Permission was also sought from the National Health Research Authority and the Lusaka District Health Management Team.

Data to support this study can be accessed upon request from the main investigator

**Conflict of interest-** None

**Funding declaration-** None

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