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Uptake of Modern Contraception Among Postpartum Women in Vihiga County, Kenya

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Abstract

Purpose: Contraception is achieved by use of modern methods such as emergency pills, barriers, oral contraceptive pills, and injectable contraceptives and implants. With devolution of health services in Kenya, it is important to understand the county-specific contraception trends and factors that influence such trends. Vihiga County has previously reported a contraception rate of 53%, lower than the national rate of 61%. Therefore, the main objective of this research was to assess uptake of modern contraception among postpartum women in Vihiga County, Kenya.

Methodology: A cross-sectional study design was implemented. Study participants and wards were selected using simple random sampling whereas purposive sampling was used to select health facilities. Questionnaires, key informant interviews, and focus group discussions were the research instruments for data collection. Qualitative data was organized into themes and presented in accordance with the study objectives. Quantitative data was analyzed using chi-square for pairwise comparison and regression.

Results: The findings revealed that knowledge regarding the nine methods of contraception was low. However, knowledge of individual contraceptive methods including DMPA, implants, pills, and coils was high. The current rate of contraceptive use in Vihiga sub-county is 62.8%, an increase from the previously reported 53%. DMPA and implants were the most used methods. Age, marital status, number of children, and period since the last birth were the most significant demographic influencers of contraceptive use among postpartum women in Vihiga sub-county. Reasons for or against use, duration of use of contraceptives, and future intent to use them were the attitude factors associated with contraceptive use. Social factors influencing contraceptive use were religion, husband agreeing, and community allowing. In terms of contraceptive access, quality of contraceptive services best influenced the uptake of contraceptives.

Conclusion: The study highlighted the need to improve state of contraceptive use in Vihiga County. It also highlighted young and single women as the populations that should be targeted when implementing contraceptive education. An understanding of social factors that influence contraceptive uptake will ensure that healthcare stakeholders make better decisions that are targeted for this population in Vihiga County.

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1.0 Introduction

Contraception is an act of intentionally preventing or delaying conception using chemicals, drugs, devices, surgical or sexual methods while maintaining an individual`s comfort and minimizing the side effects. Contraceptives can be categorized into two. Traditional means include lactational amenorrhea and rhythm method while modern methods include emergency pills, barriers, oral contraceptive pills, and injectable contraceptives and implants. Surgical, methods include intrauterine devices and female and male sterilization (United Nations, 2020). Since the year 1994, there has been a remarkable improvement in the reproductive health of women after a conference was held addressing population in relation to development (Osotimehin, 2015). Africa has the largest gap for unmet need for modern contraception at 24.2% followed by Caribbean and Asia at 10.2% (United Nations, 2020).

To improve these statistics, a global partnership dubbed ``Family Planning 2020'' (Family Planning, 2018) was declared as part of the Sustainable Development Goals` (SDGs) short-term goals in 2015, to enable 120 million more women to access family planning by the year 2020 (Family Planning, 2018). In addition, the ``postpartum family planning'' program was implemented by WHO in 2013, targeting postpartum women. The program aims to enable women to choose and initiate a contraceptive method of choice and sustain its use for two or more years. The recommended birth spacing gap is at least 12 months following childbirth, which among many other advantages gives the woman time to heal and make the uterus ready for carrying another pregnancy (Family Planning, 2018; Jackson & Glasier, 2011).

In Kenya, the national family planning programme was implemented in 1967, becoming the pioneer country to implement this programme in Sub-Sahara. There was a reduced total fertility rate as a result of 8 to 5 children per woman between the years 1970-1990. Currently, national contraceptive prevalence rate is 61%, above East Africa`s average of 39.5% and sub-Saharan`s 28.4% (Akoth et al., 2021).

Kenya implemented the national family planning programme in the year 1967; becoming the first country in sub-Saharan Africa to implement such a programme. This helped in reduction of total fertility rate (TFR) from eight children per woman in the 1970s to five children in the 1990s. Currently, national contraceptive prevalence rate is 61%, above East Africa`s average of 39.5% and sub-Saharan`s 28.4% (Akoth et al., 2021). As part of the FP 2020 commit-making countries, Kenya committed to meet a 58% contraceptive prevalence rate by 2020 and this was achieved in the year 2018 (Akoth et al., 2021). As a result, there has been a decline in TFR nationally from 4.17 in the year 2000 to 3.79 children per woman in 201 (Knoema, 2020).

Contraception is recommended as early as three weeks for non-lactating women and six weeks for lactating women with no medical conditions that may prevent utilization of these services (United Nations, 2018). In Kenya, access to contraception services has been made universal as well as removal of barriers inhibiting access of these services (Family Planning, 2018).

In Vihiga County, most women wait until menses resume after child birth for them to utilize contraceptives with an average time period being nine months (Naanyu et al., 2013). Apart from delay in utilization, the proportion of women utilizing it is low, evidenced by a lower contraceptive prevalence of 53% in the county (AFIDEP, 2019), against the national average

of 61%% as of the year 2020 (FP 2020). This prevalence is the lowest among the western region counties (AFIDEP, 2019)

This has had an impact on the health indicators of Vihiga County such as an increased fertility rate of 4.5 children per woman against a national average of 3.8, higher population growth rate of 2.5% against the national average of 2% and increased incidences of anaemia among infants and expectant mothers among others (AFIDEP, 2019; United Nations, 2020). This study therefore intended to find out the factors that contribute to low contraceptive prevalence as well as delayed postpartum contraceptive utilization in Vihiga County. Results from the study will help to understand the current contraceptive trend in Vihiga County and factors that lead to these trends. Negative trends if left unchecked will overstretch the available resources in the long run, and hamper progress leading to poor living standards in the county. Positive trends, on the other hand, will encourage good practices to enhance even better contraception habits. It is for this reason the researcher was interested in this county, to find out the factors affecting the uptake of modern contraceptives.

1.1 Study Objectives

i. To find out the level of knowledge of postpartum women on contraception in Vihiga Sub-County.

ii. To determine the rate of modern contraceptive use among postpartum women in Vihiga Sub-County.

iii. To identify factors influencing the uptake of modern contraception by postpartum women in Vihiga Sub-County.

2.0 Methodology

The study adopted a cross-sectional study design. The study was conducted in Vihiga sub-county, specifically in Central Maragoli and Lugaga-Wamulama wards. Study participants and wards were selected using simple random sampling whereas purposive sampling was used to select health facilities. Questionnaires, key informant interviews and focus group discussions were the research instruments for data collection. Qualitative data was organized into themes and presented in accordance with the study objectives. SPSS version 22 was used for data analysis and presentation. Multiple regression was used to analyse more than two variables and chi-square for pairwise comparison.

3.0 Results and Discussion

3.1 Summary of Demographic Characteristics

To understand the demographic characteristics of study participants, the questionnaires collected data about characteristics that would best describe the participants. This data is what is relevant to their position as women using modern contraceptive methods. This data included the participants' age, education level, current occupation, income, marital status, number of children when they last gave birth, and their religion.

The study participants consisted of individuals between 18 and 50 years. Majority of participants were between 21 and 30 years (N=209, 55%), followed by 31–40-year-olds (N=110, 29%). 33 (8.7%) of the participants were between 18 to 20-years-old, and the least number of participants were those between 41 and 50 years (N=27, 7%) as summarized in Table 4.1 below. Education level was also assessed. Majority of participants had attained

secondary education (N=160, 42%) followed by primary education at 29.3% (N=111). Master's degree level had the least number of participants at 1% (N=4) followed by degree, certificate, and diploma holders (N=23, 6%; N=40, 10.5%; N=41, 10.8% respectively, Table 4.1). Unemployed participants formed the largest proportion of participants at 35.9% (N=136) followed by self-employed individuals (N=119, 31.4%). Participants engaged in casual jobs formed 17.9% of the participants (N=68) and those employed were the least at 13.7% (N=52), (Table 1).

Majority of the participants earned below KES5,000 per month (N=227, 59.9%), while a few earned between KES31,000 and KES40,000 (N=9, 2.4%) followed by that earning between KES 21,000 and KES30,000 (N=11, 2.9%). The other income brackets were KES 5,000-10,000, KES10,000-20,000, and above KES 40,000 (N=88, 23.2%; N=23, 6.1%; N=16, 4.2% respectively, Table 4.1). The study also collected data on participants' marital status. Out of the women recruited into the study, 81.3% were married, (N=308), 16.1% were single (N=61), and 10% were separated (N=10), as shown in Table 4.1. Participants had a range of number of children, between no to eight children. The majority of participants had one or two children (N=118, 31.1%; N= 102, 26.9%, respectively), while the least had eight and seven children (N=1, 0.3%; N=7, 1.8% respectively). The remaining participants had between three and six children and are summarized in the table below (Table 4.1). The participants were also assessed for the amount of time since their previous birth. 41.1% of the participants had their last birth more than a year before the time of data collection (N=156). The remaining participants ranged below one year below 12 months, 9 months, 6 months, and 3 months (N=46, 12.1%; N=62, 16.4%; N=62, 16.4%; N=52, 13.7%, respectively, Table 4.1). Finally, the study participants were made up of a majority of Christians (N=363, 97.8%) and minority Muslims (N=16, 4.2%) in Table 1 below.

Table 1: Demographic Statistics

	Category	Frequency (N)	Percentage
Age	18-20	33	8.71
	21-30	209	55.15
	31-40	110	29.02
	41-50	27	7.12
Education	Primary	111	29.29
	Secondary	160	42.22
	Certificate	40	10.55
	Diploma	41	10.82
	Degree	23	6.07
	Masters	4	1.06
Occupation	Casual jobs	68	17.94
	Employed	52	13.72
	Self-employed	119	31.4
	Not employed	136	35.88
	No response	4	1.06
Income	Not employed	5	1.32

	Below 5000	227	59.89
	5000-10000	88	23.22
	10000-20000	23	6.07
	21000-30000	11	2.9
	31000-40000	9	2.37
	Above 40000	16	4.22
Marital status	Married	308	81.27
	Separated	10	2.64
	Single	61	16.09
No. of children	0	2	0.53
	1	118	31.13
	2	102	26.91
	3	67	17.68
	4	42	11.08
	5	27	7.12
	6	13	3.43
	7	7	1.85
	8	1	0.26
When last birth	Above 1yr	156	41.16
	Below 12mnths	46	12.14
	Below 3mnths	52	13.72
	Below 6mnths	62	16.36
	Below 9mnths	62	16.36
	No response	1	0.26
Religion	Christian	363	95.78
	Muslim	16	4.22

3.2 Level of knowledge of postpartum women on contraception

Knowledge was assessed through the structured questionnaire and encompassed various aspects of contraception utilization: basic contraceptive knowledge, effectiveness awareness, knowledge of side effects and risks, mechanism of action, and emergency contraception. Basic knowledge assessed whether participants understood the different nine modern contraceptive methods based on their categories: barrier, hormonal methods, IUDs, sterilization, and emergency contraception. Effectiveness awareness evaluated whether participants knew the extent to which a contraceptive was effective and circumstances under which a method would not be utilized. Side effects evaluated participants` knowledge of possible side effects associated with different contraceptive methods. Mechanism of action was assessing whether a participant could categorize how a method worked, either preventing ovulation, sperm barriers, or altering cervical mucus. Emergency contraception assessed whether participants knew contraception they would use in case of an emergency and their appropriate use. The result of each participant was tallied in form of a percentage of the total score.

Although the government is advocating for long-acting reversible contraceptives (LARC), this study assessed all the modern contraceptive methods for purpose of research just to ascertain whether these methods are known by women. High level of knowledge was categorized as a score of more than 50% of the total score while low knowledge was a score of less than 50% of the total score. The results showed that majority of the participants (86.8%, N=329) had high knowledge levels while only 13.2% (N=50) had low knowledge as shown in Table 4.2 below.

The most known contraception method as assessed in the various categories was DMPA (depot-medroxyprogesterone acetate, mostly known as Depo Provera) at 86% (N=326) followed by implants at 81.3% (N=308). Pills and the coil were the next most known at 69.4% and 54.9% respectively (N=263, N=208 respectively). The least known methods were the use of Postinor 2 at 1.8% (N=7) and natural methods/withdrawal at 2.6% (N=10). Analysis of variance (ANOVA) revealed that these differences were statistically significant ($p < 0.0001$, $r^2 = 0.4786$), as in Table 2.

Table 2: Level of knowledge

Knowledge level	Knowledge level	Frequency	Percentage
Total knowledge	High (<50%)	329	86.81
	Low (>50%)	50	13.19
Individual methods			
IUD	Low (<50%)	38	10.03
Condoms	Low (<50%)	89	23.48
Pills	High (>50%)	263	69.39
Implants	High (>50%)	308	81.27
DMPA	High (>50%)	326	86.02
Coils	High (>50%)	208	54.88
Withdrawal	Low (<50%)	10	2.64
Postinor 2	Low (<50%)	7	1.85
Tubal ligation	Low (<50%)	20	5.28

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Table 3: Level of knowledge

Knowledge level	Knowledge level	Frequency	Percentage
Total knowledge	High (<50%)	329	86.81
	Low (>50%)	50	13.19
Individual methods			
IUD	Low (<50%)	38	10.03
Condoms	Low (<50%)	89	23.48
Pills	High (>50%)	263	69.39
Implants	High (>50%)	308	81.27
DMPA	High (>50%)	326	86.02
Coils	High (>50%)	208	54.88
Withdrawal	Low (<50%)	10	2.64
Postinor 2	Low (<50%)	7	1.85
Tubal ligation	Low (<50%)	20	5.28

3.4 Rate of modern contraceptive use

3.4.1 Contraceptive method currently used

To understand the rate of use of modern contraceptives by postpartum women in Vihiga County, questionnaires administered collected information regarding the contraception method currently in use by the participants. 141 participants (37.2%) mentioned that they did not use any contraceptive method. This translates to a usage rate of 62.8% (N=238) as in Table 4 below.

Table 4: Rate of contraceptive use

	Frequency	Percentage
Using	238	62.8
Not using	141	37.2

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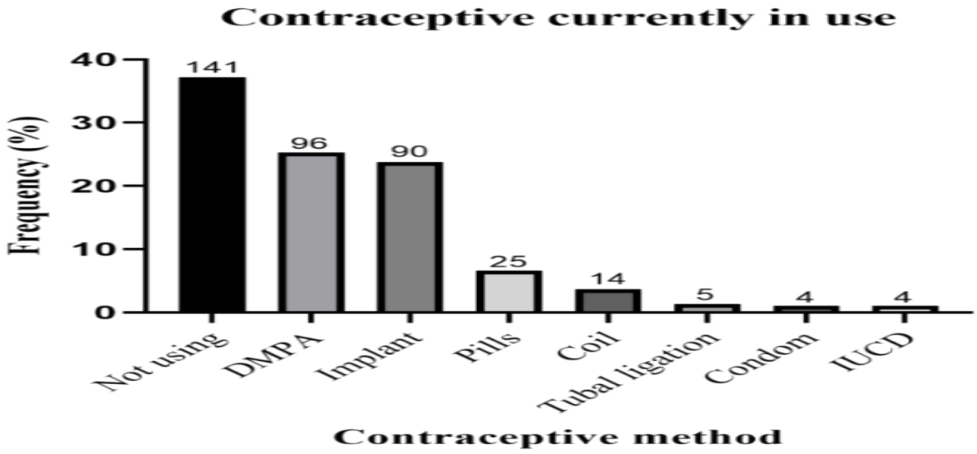
Out of those using contraceptives, DMPA was the most commonly used at 25.33% (N=96) followed by Implants at 23.75% (N=90). Pills and the coil were also used by participants though not very frequently (N=25, 6.6%; N=14, 3.69% respectively). The least used methods were IUCDs and condoms both at 1.06% (N=4) followed by tubal ligation at 1.32% (N=5). This information is summarized in Figure 1 below.

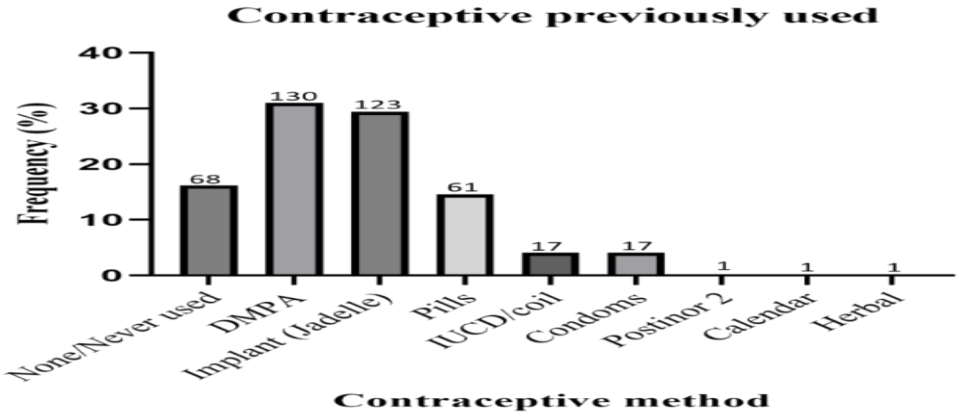
Figure 1: Current contraceptive used



3.4.2 Contraceptive method previously used

To compare the current status of contraceptive use, data was also collected regarding the methods that the participants had used before their current method. Of the study participants, 16.2% (N=68) had never used contraceptives. DMPA and the implant were the most used methods at 31% (N=130) and 29.4% (N=29.4) respectively. Pills followed at 14.6% (N=61), thenIUCD/coil and condoms each at 4.1% (N=17) while the least used method was Postinor 2. These findings are summarized in Figure 2.

Figure 1: Previous contraceptive used



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3.5 Factors influencing uptake of contraceptives

3.5.1 Women-related factors

Demographics

To understand the influence of demographic factors on contraceptive use, multiple logistic regression was applied to the demographic characteristics to understand whether any of them was associated with the use of contraceptives. The data was also categorized to analyze the differences in the categories for each variable. Results are summarized in Table 4.4 below. Some notable results show that women earning above KES40,000 had three times the odds of using contraceptives compared to those earning 5,000 to 10,000. Women who had children more than one year ago were three times more likely to use contraceptives than those who had children less than 12 months ago (Table 5).

Table 5: Regression analysis of demographic factors influencing contraceptive uptake

Variable	Categories	Odds Ratio	95% CI	P-value
	Intercept	**5.53**	**1.136 - 27.77**	**0.036**
Age	Age	0.94	0.896 - 0.977	**0.003**
Education	Education	1.03	0.798 - 1.327	0.833
Occupation	Self-employed			
	Not employed	0.65	0.311 - 1.332	0.242
	Employed	0.70	0.2645 - 1.890	0.482
	Casual jobs	0.90	0.432 - 1.897	0.782
Income	5000-10000			
	Below_5000	1.79	0.898 - 3.614	0.100
	10000-20000	0.74	0.242 - 2.282	0.592
	31000-40000	0.93	0.183 - 5.234	0.936
	Above_40000	3.08	0.625 - 16.95	0.177
	21000-30000	1.16	0.262 - 5.550	0.851
	Not employed	0.16	0.007 - 1.408	0.138
Marital Status	Married			
	Single	0.23	0.117 - 0.439	**<0.0001**
	Separated	0.34	0.072 - 1.508	0.158
No. of Children	Number of Children	1.24	1.005 - 1.549	**0.048**
Period since last birth	Below_12months			
	Below_3months	0.46	0.193 - 1.094	0.081
	Above_1year	3.12	1.469 - 6.683	**0.003**
	Below_9months	2.53	1.077 - 6.067	**0.035**
	Below_6months	1.97	0.837 - 4.690	0.122
Religion	Christian			
	Muslim	0.81	0.241 - 2.976	0.732

Attitude Towards Contraceptives

The study also sought to understand factors that were specific to the attitude women had toward contraceptives and whether or not they predicted the use or lack thereof, of contraceptives. The data was unable to generate multivariate logistic regression due to linearity of some of the variables. The data was therefore analyzed using multivariate linear regression. The regression analyses generated an analysis of variance (ANOVA) which showed that the reasons for or against contraceptive use, duration of use, and future intent to use contraceptives ($p<0.001$, $p<0.001$, and $p=0.04$, respectively) accounted for the most significant difference between the participants who used or did not use contraceptive methods (Table 6).

Table 6: ANOVA of contraceptive attitudes towards contraceptive use

Analysis of Variance	SS	DF	MS	F (DFn, DFd)	P value
Regression	**79.23**	**39**	**2.03**	**73.91**	**<0.001**
Contraception Benefits	0.05	5	0.01	0.357	0.878
Contraception Information Source	0.02	6	0.00	0.148	0.989
Reasons for/against us	4.22	16	0.26	9.606	**<0.001**
Use duration	13.12	5	2.63	95.50	**<0.001**
Future intent	0.18	2	0.09	3.245	**0.040**
Contraceptive source	0.09	5	0.02	0.624	0.682
Residual	9.32	339	0.03		

Some of the contraceptive attitudes and factors had more than one response and had to be analyzed separately. For instance, perceived side effects had more than one response from some participants. The results showed that of the 18 side effects mentioned by the participants, over-bleeding significantly doubled the odds of using or lack of use of contraceptives (OR=2.029, p=0.004). Dizziness also increased the odds by almost two times (OR=1.932, p=0.03). Side effects categorized as 'others' included myths, breaking marriage, conflict, permanent disability, disabled children, difficulty breathing, moods, enlarged breasts, milk loss, fibroids, rashes, oedema. The frequency of these responses was too small (<3 participants) and were therefore clustered together. These 'other' factors also increased the odds three times (OR=3.132, p=0.02). The results are summarized in Table 7.

Table 7: Regression analysis of perceived contraceptive side effects influencing contraceptive use

Variable	Odds Ratio	95% CI	P value
Intercept	**0.678**	**0.388 - 1.179**	**0.170**
Irregular periods	1.154	0.667 - 2.022	0.613
Backache	1.575	0.830 - 3.084	0.173
Weight changes	1.333	0.798 - 2.248	0.276
Over-bleeding	2.029	1.258 - 3.293	**0.004**
Appetite change	1.536	0.717 - 3.486	0.284
Blood pressure	0.413	0.149 - 1.080	0.077
Headache/feeling sick	2.054	1.007 - 4.413	0.055
Failure	1.274	0.681 - 2.439	0.455
Miscarriage/delayed conception	0.644	0.301 - 1.362	0.250
Libido changes	1.020	0.431 - 2.496	0.964
Fatigue	1.741	0.913 - 3.442	0.100
Cramps/Stomach ache	0.482	0.167 - 1.404	0.173
Dizziness/nausea	1.934	1.078 - 3.566	**0.030**
Displaced IUD	2.454	0.472 - 18.80	0.318
Cancer	3.133	0.903 - 12.92	0.086
Others	0.660	0.321 - 1.357	0.256
None/unknown	3.132	1.171 - 8.921	**0.026**

Another factor with multiple responses was how the participants dealt with side effects. A multiple logistic regression could not be run on this analysis due to some linearity therefore a multiple linear regression was carried out. The model through an AMOVA showed that women who assumed the side effects and continued their use, those who used painkillers, those who discontinued the method, and those who changed methods significantly varied between those using and not using contraceptives. The data showed that participants who dealt with the side effects by assuming and continuing, using painkillers, discontinuing the method, or changing the method accounted for the most significant variance between individuals using or not using contraceptive methods ($p<0.001$ for each).

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Table 8: ANOVA of how participants dealt with contraceptive side effects against contraceptive use

Analysis of Variance	SS	DF	MS	F (DFn, DFd)	P value
Assume and continue	4.634	1	4.634	23.64	**<0.001**
Painkillers	3.709	1	3.709	18.92	**<0.001**
Discontinued	2.307	1	2.307	11.77	**<0.001**
Changed method	3.201	1	3.201	16.33	**<0.001**
Exercise	0.056	1	0.056	0.287	0.592
Regula eating	0.275	1	0.275	1.401	0.237
Water/Rest	0.545	1	0.545	2.778	0.096

3.5.2 Social factors

A multivariate regression analysis of social factors was carried out to understand their influence on contraceptive use. Social factors included whether the participants' religion allowed contraceptive use, whether they discussed the decision with their husbands and if they allowed their use, and lastly, whether their communities allowed contraceptive use. The results showed that religion had a significant influence on the use of contraceptives. Religion allowing contraceptive use doubled the probability of using them (OR=2.32, p=0.044). The husband agreeing with the use also significantly influenced the use, compared to discussing with the husband (p<0.001 vs 0.147 respectively). Statements that were true to the community's take on contraceptives were also significantly associated with contraceptive use (p=0.004) as in Table 9.

Table 9: Regression analysis of social factors influencing contraceptive use

Variable	Odds Ratio	95% CI	P value
Intercept	**5.869**	**2.496 - 14.85**	**<0.001**
Religion allows	2.320	1.047 - 5.434	**0.044**
Religion truth	0.612	0.433 - 0.844	**0.003**
Discuss with husband	1.717	0.833 - 3.612	0.147
Husband agrees	0.510	0.375 - 0.683	**<0.001**
Community allows	1.017	0.737 - 1.411	0.918
Community truth	0.623	0.447 - 0.852	**0.004**

3.5.3 Contraceptive accessibility

The study also collected information regarding the accessibility of contraceptives by women either using or not using modern contraceptive methods in Vihiga County. Accessibility was assessed by investigating whether contraceptives were available at the nearest facility, whether contraception services were free of charge, whether the service providers were friendly, whether participants feared the service providers, and whether participants were given all the valid contraception information. The study also collected data on the frequency of contraceptive stockouts at the nearest health facility, whether these stockouts discourage the

participants from using contraceptives, and whether the contraception services were considered of quality by participants. Results showed that the quality of contraceptive services contributed to the most significant variance between participants using and not using contraceptives (p=0.001) as in Table 10.

Table 4.10: ANOVA of contraceptive accessibility against contraceptive use.

Analysis of Variance	SS	DF	MS	F (DFn, DFd)	P value
Regression	**6.672**	**16**	**0.417**	**1.955**	**0.015**
Contraceptives available in nearest facility	0.429	2	0.214	1.005	0.367
Get contraceptive services free of charge	0.150	2	0.075	0.351	0.704
Contraceptive service providers are friendly to me	0.035	2	0.017	0.081	0.922
Contraceptive service providers give all information	1.085	2	0.543	2.544	0.080
I fear contraceptive service providers	1.045	2	0.523	2.450	0.088
Frequent stockout of my choice contraceptives	0.396	2	0.198	0.928	0.396
Frequent contraceptive stockouts discourage me	0.177	2	0.088	0.414	0.661
Contraception services I get are of high quality	3.280	2	1.640	7.690	**0.001**

4.0 Discussion

4.1 Demographic characteristics of study participants

The study recruited women aged between 18 to 50 years, where the majority of participants were between 21-30 years followed by between 31-40 years. This is supported by data that has shown that the age bracket between 21 to 40 years is ideal for childbirth. Most women start giving birth at around 22 years and end in their late 30's since fertility goes down after the age of 35 (Jensen et al., 2018). Education level of study participants varied from Primary education to Master's level. The majority having attained Secondary education is a good indicator of the improved statistics for education of women from rural Kenya. Free primary education has encouraged many individuals to complete primary education and may affect their progression to secondary education. The introduction of free day secondary education could also have a role to play in the observed distribution (Orodho, 2014). Majority of the study participants were not employed, and close to those were the self-employed. Majority of women in rural Kenya have remained stay-at-home wives with their husbands serving as the sole family breadwinner. However, this has been changing with changes in economic needs of families, women's education, and increased opportunities owing to open-mindedness (Macharia, 2020). This

explains the growing number of self-employed women in this study. Majority of the women were below the KES 5000 per month income mark. This is explainable by the number of unemployed individuals, and those involved in casual jobs, or are self-employed in small enterprises.

Married women were the most among the study participants as is expected with postpartum women in rural Kenya. Most of the women had either one or two children with lesser women having more children. This is supported by the dropping fertility rate that has been recorded in Kenya. Kenya is said to have the lowest fertility rate in East Africa, with 3.9 births per female compared to 5.6 in Uganda, 5.0 in Tanzania, 6.3 in Somalia, and 4.2 in Ethiopia (Chen et al., 2022). Additionally, majority of the participants being below 30 years of age justifies this number of children. Most of the study participants reported that their last birth was more than 1 year ago. Considering most women say they begin birth control methods after the return of women's menses post-birth, menses will mostly return after six months of exclusive breastfeeding (Chen et al., 2022). This means that majority of women will begin contraceptives from six months and above after their last birth, as observed in this data. Christians made up 96% of the participants compared to 4% Muslims because Christianity is the dominant religion in Kenya and in Vihiga county.

4.2 Level of knowledge of postpartum women on contraception

The level of knowledge of modern contraceptive methods of postpartum women in Vihiga Sub-County was high. 86.81% of the women scored more than 50% of the total score in this study. Kenya was among the first countries to commit to the FP 2020 partnership when it was launched in 2012. The country then committed to put at least 58 percent of all married women on modern contraception. To achieve this, the Kenyan government provides some contraceptive methods for free including injectables (DMPA), implants, pills, the coil, and condoms (Akoth et al., 2021). This makes the methods easily accessible and relevant as information given by healthcare workers relates to what is available in the healthcare facilities.

The biggest percentage of participants were aware of depot-medroxyprogesterone acetate (DMPA). This is supported by many other studies that have shown injectable contraceptives such as DMPA being the most preferred method among adolescents and adult women (Akinyemi et al., 2022; Wernick et al., 2022). Due to its low rate of adverse effects, it is even preferred by sickle cell patients (Roe et al., 2022) and breastfeeding women because it does not alter or stop production of breastmilk (FHI, n.d.). The knowledge of DMPA was followed by implants, pills, and the coil respectively. This same popularity trend has been observed in other Kenyan-based studies (Lunani et al., 2018) and in other countries (Apanga et al., 2020; Nagendran & Godakandage, 2021). Condoms, despite being provided for free at public health centers, had a low level of knowledge. This could be due to the percentage of married women in this study. Male condoms are rarely a birth control method offered to married women because they are meant for males, and they are not used by married couples since they could be a sign of infidelity (Ochako et al., 2015). The current study showed the use of Postinor 2 as the least known contraception method. Postinor 2 and other emergency contraceptive pills are administered after unprotected sex to prevent conception. Studies have shown that its uptake in Africa and Kenya has been low either because of a lack of knowledge or concerns of failure and adverse effects (Kwame et al., 2022; Muia et al., 2000).

4.3 Rate of modern contraceptive use

From this study, the rate of contraceptive use was higher than the national rate, 62.8% compared to 61% nationally. This is also higher than the national prevalence of 53% previously reported in the recent past (AFIDEP, 2019). Contraceptives have become more popular and prevalence rate is increasing Africa-wide (Pleah et al., 2016; Smith, 2020). This increase could be attributed by increased flow of contraception information through technology that has its reach in rural Kenya (Ndung'u, 2019). DMPA and implants were the most used methods respectively, which agrees to the data collected regarding knowledge of contraceptives. These methods are the most used across the world in current times (Akinyemi et al., 2022; Apanga et al., 2020; Lunani et al., 2018; Nagendran & Godakandage, 2021; Wernick et al., 2022). The same methods were the most popular among participants in the past used contraception methods. They are mostly preferred due to the lower rates of adverse effects, and the long-term effectiveness therefore requiring less frequent attention and maintenance.

These contraceptives were mostly sourced from public facilities, and only 16 participants reported obtaining them from chemists and other sources. They also reported that contraceptives were accessible in the nearest facilities, were free of charge, service providers gave them information and services were of good quality. This is in line with the aims of SDG's short-term goals to increase contraceptive uptake through theFamily Planning 2020 global partnership (Family Planning, 2018).

4.4 Factors influencing uptake of contraceptives

Multiple logistic regression model showed that age, marital status, number of children,, and period since the last birth had the most significant influence on contraceptive use among postpartum women from Vihiga County. The regression was performed for individual groups in some demographic characteristics. In marital status, single women had 77% lower chances of using contraceptives compared to married women. This has been the trend since the1980s in Kenya (Kamuyango et al., 2020) and can be justified by the rate of consistent sexual intercourse in married couples. There is a a higher likelihood of getting pregnant when a woman lives with her husband, therefore necessitating a need to plan their family. Marital status has also been shown to influence contraception uptake in other studies (Akoth et al., 2021). The period since the last birth also showed significant association with contraceptive use. Women whose last birth was over a year ago were 3 times more likely to use contraceptives compared to those whose last birth was less than 12 months ago. On the contrary, those whose last birth was less than three months ago had 54% reduced chances of contraceptive use compared to those less than 12 months ago (though not statistically significant). Education is evident as a major driver of contraceptive use in Kenya and in the world, where higher levels of education show higher rates of contraceptive use (Gichangi et al., 2020; Jalang'o et al., 2017). Education, however, did not show a significant association with contraceptive use in the current study. This aligns with other studies that have not observed any significance (Hossain et al., 2018; Mathe et al., 2011). Contraceptive accessibility also influenced contraceptive use as highlighted in section 5.3 above. The most significant factors of accessibility that influenced contraceptive use were fear of health workers and quality contraception services as supported by previous research (Tappis et al., 2015).

The study further assessed the effects of attitudes towards contraceptives on contraceptive use. The attitudes were based on contraception beliefs, source of information on contraceptives, reasons for or against their use, duration of use, future intent to use, and source of contraceptives. The results showed that the most significant variance between participants using or not using contraceptive methods were based on their reasons for or against contraceptive use, duration of use, and future intent to use. Reasons for or against use have a predictable correlation with use or lack of use since these reasons determine the contraceptive use. Duration of use was also significantly different between participants using or not using contraceptives. Studies have shown that most women only use specific birth control methods for short periods, usually 36 months or less as observed in a Saudi Arabia-based study (Mahboub et al., 2015). This could be because of the need to space children where three years could be viewed as enough space. Women who are just starting the use of contraceptives are likely to adhere more to the use than those who have used them for longer periods. Future intent to use contraceptives was also significantly different in the use groups because future intent indicated that the participants did not currently use the modern contraceptive methods. Finally, the source of contraceptives also showed significant differences between the use groups. From this study, public health facilities were preferred as a source of contraceptives compared to private facilities and chemists. This could be due to the free contraceptive services offered by the Kenyan government through public facilities (Akoth et al., 2021) towards achieving the SDGs (Family Planning, 2018). Free contraceptives have incentivized women from rural areas of Kenya such as Vihiga Sub- County to utilize the services. However, the contrary was found in some studies where private facilities were the preferred source of contraceptives in Nigeria and Indonesia (Oye-Adeniran et al., 2005; Schoemaker, 2005) where the burden of contraception services had not yet been successfully transferred to the government.

Other attitude factors were analyzed separately including perceived side effects and methods of dealing with side effects. Of the perceived side effects, over bleeding and dizziness or nausea were significant determinants of use or lack of use of contraceptive methods. Over bleeding was the most frequently expected side effect, followed by weight changes and dizziness or nausea. Over bleeding also known as menorrhagia usually results in dizziness since blood loss leads to lower oxygen levels that lead to dizziness. Over bleeding is the most common side effect of different contraceptive methods across the world (Amat et al., 2018; Bahamondes et al., 2015; Culwell & Curtis, 2009; Maia & Casoy, 2008). It remains a major cause for concern in pharmaceutical and device companies and methods that avoid over bleeding are in development. The method used to deal with side effects also showed significant variance between participants using and not using contraceptive methods. Those who assumed and continued with the methods, or used painkillers, or changed methods were mostly those who used the contraceptive methods. This is either because they were able to tolerate or mitigate the side effects, or use an alternative method. On the other hand, those who discontinued the use of contraceptives due to side effects were those who did not use the methods.

Social factors that were assessed to influence the use of modern contraceptive methods included religion, the husband and the community. Religion allowing contraception use and statements that were true about religion factors including ‘my religion allows’, ‘my religion does not allow’, and I use despite my religion not allowing’. Religion allowing increased the likelihood of contraceptive use. In this study, most of the participants classified as Muslim did not use contraceptives, and a few of these said they used despite their religion not allowing

contraceptive use. Religious groups like Catholicism, Hinduism and Islam prohibit the use of contraceptives, while protestants are more liberal regarding contraceptive use (Hill et al., 2014; Iyer, 2002; Obasohan, 2015). Contraception use was also influenced by whether or not the participants' husband agreed with it. Spousal support and communication with them is a factor that largely influences contraceptive use across Africa (Blackstone et al., 2017; Muanda et al., 2016; Prata et al., 2015).

Finally, contraceptive use was assessed based on factors that define contraceptive accessibility. The quality of contraceptive services accounted for the most variation in use of contraceptives among the participants. Several studies have confirmed this association. For instance, a study in urban Kenya assessed that quality of contraceptive services in terms of availing patient preferences, assistance with method selection, availing information on side effects, and provision of treatment were most associates with contraceptive use (Tumlinson et al., 2015). Another study showed that quality services tripled the odds of contraceptive use in Burkina Faso, Ethiopia and Uganda (Fruhauf et al., 2018). A study in the Philippines highlighted the importance of quality contraceptive services and recommended standardization of a quality assessment tool that could be used across the board to ensure women receive quality services without discrimination (Hancock et al., 2016).

5.0 Conclusion

Knowledge regarding the nine methods of contraception was high (86.81%). Knowledge for individual contraceptive methods including DMPA, implants, pills and coils was equally high. This is owed to the Kenyan Government's initiative to achieve the SDG 'Family Planning 2020' through provision of free contraceptives in public health institutions. According to data from this study, the current rate of contraceptive use is 62.8%, an increase from the previously reported 53%. DMPA and implants were the most used methods due to their long-acting nature and less side effects. age, marital status, number of children, and period since the last birth were the most significant demographic influencers of contraceptive use among postpartum women in Vihiga County. Attitude towards contraceptive use that most influenced their use included reasons for or against the use, duration of use, and future intent to use contraceptives. Over bleeding and dizziness or nausea were the side effects that most significantly influenced the uptake of contraceptives. Social factors that influenced the uptake of contraceptives were religion, the participant's husband agreeing, and their community allowing contraceptive use. Lastly, contraceptive use was most significantly influenced by the quality of contraception services compared to other factors of contraceptive accessibility among postpartum women in Vihiga County.

6.0 Recommendations

Following the study findings, it is recommended that information on contraception should be rolled out continuously since the efforts so far seem to have a positive effect on contraceptive use. Knowledge levels are high, and the rate of use has increased.

Considering that age, marital status and period since last birth most significantly affect contraceptive uptake, it is important for the women affected negatively by these factors to be targeted during contraceptive information dissemination.

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