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RESEARCH ARTICLE

UPTAKE OF CONTRACEPTION AND ASSOCIATED FACTORS AMONG ADOLESCENTS AND YOUNG WOMEN AGED BETWEEN (15-24) YEARS IN RWANDA

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Abstract

Background: Globally, contraceptive uptake among married women was estimated at 65% in 2024, with modern methods accounting for 58.7% (Hellwig & Barros, 2022). In sub-Saharan African countries the uptake remained suboptimal, with considerable variation in the usage of modern contraceptive methods.Adolescents and young women aged 15–24 years represent a critical demographic group for reproductive health interventions, yet they often face barriers to accessing contraceptive services. In many low- and middle-income countries, including Rwanda, the uptake of contraception among this age group remains low, contributing to high rates of unintended pregnancies, early childbearing, and associated health risks.

Objectives: To assess contraception uptake and identify associated factors among Rwandan adolescents and young women aged 15-24.

Methodology: This research utilized secondary data from the 2019/2020 Rwanda Demographic and Health Survey. A cross-sectional quantitative design was applied. The study focused on a representative group of adolescent girls and young women aged 15 to 24, examining socio-demographic characteristics, maternal knowledge and perceptions about contraceptive use, healthcare access, and cultural factors. Data analysis included descriptive statistics, with categorical variables presented as frequencies and percentages, and continuous variables expressed as means with standard deviations. Relationships between variables were first explored using the chi-square test, considering a p-value below 0.05 as statistically significant. Variables that showed significance in bivariate analysis were further examined through multivariate logistic regression, and findings were expressed using adjusted odds ratios along with 95% confidence intervals

Results: The findings revealed that 14.17% of adolescent girls and young women between the ages of 15 and 24 were using contraceptives. Women aged 20 to 24 were approximately 4.5 times more likely to use contraception compared to younger counterparts. Those with two or more children had twice the likelihood of using contraceptives. Participants with higher levels of education were 3.5 times more likely to use contraception than those with no formal education. Additionally, Catholic respondents were four times more likely to use contraceptives compared to Protestant women. Finally,
individuals who received information about contraceptives at health facilities were five times more likely to adopt their use.

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Conclusions: Age, education, parity, religion, and information received at health facilities significantly influenced contraceptive use.

Introduction:-

Contraceptive uptake, particularly among young women aged 15 to 24 years, was a critical societal concern rooted in reproductive health and contraceptive use practices (Bhatt et al., 2021). This age group represented a pivotal stage in a woman's life concerning reproductive decisions and contraception choices (Wulifan et al., 2015). The contraception use help achieving sustainable development goals and promoting overall well-being could not be understated (McCleary-Sills et al., 2014). Globally, the rate of contraceptive uptake was estimated at 65% in 2022, with modern methods accounting for 58.7% among married women (Hellwig & Barros, 2022). However, contraception uptake incountriles located in south Africa remained suboptimal, with considerable variation in the usage of modern contraceptive methods.

Central African Republic, only 3.5% of women of reproductive age used contemporary contraceptives, while Namibia had a greater prevalence, with 49.7% of the population using modern contraception (Castro Torres et al., 2022).
Infants born within two years of an older sibling were found to have a 60% higher likelihood of experiencing infant mortality. Similarly, infants born within a 2-3-year interval had a 10% greater risk compared to those born after a gap of three years or more (Celik& Hotchkiss, 2015).

In Rwanda, despite significant progress in improving its healthcare system, including reproductive health services, challenges persisted in ensuring universal access to contraception, especially among young women (Cleland, 2012). The RDHS 2019-2020 revealed a disparity in contraceptive usage across age groups. Among young women aged 15-24, the contraceptive usage rate was 66.3%, the lowest across age groups. This rate increased to 77.6% for women aged 25-29, peaked at 83% for those aged 35-39, and then declined to 60.8% for the 45-49 age group (NISR, 2021). These statistics underscored the importance of a detailed examination of the factors linked with contraceptive uptake among young women aged 15-24 (NISR, 2021).

Methodology:-

Study design

This research used a retrospective cross-sectional design, drawing on secondary data from the 2019–2020 Rwanda Demographic and Health Survey (RDHS). The cross-sectional method was suitable for examining data gathered at one point in time to explore contraceptive use and the related factors among adolescent girls and young women aged between 15 to 24 years.

Setting and Intervention

The study was conducted in Rwanda, a landlocked country in Eastern Africa, neighbor to Uganda in the north, Burundi to the south, the Democratic Republic of the Congo to the west, and Tanzania to the east. Rwanda's topography is diversified, with mountains, savannahs, and a large number of lakes. The country is organized into administrative provinces, districts, sectors, and cells. Rwanda's population is relatively youthful, with a considerable proportion falling between the ages of 15 and 24, making it an appropriate target for our study

Study population

The study focused on women between the ages of 15 and 24, as recorded in the 2019–2020 Rwanda Demographic and Health Survey (RDHS) dataset.

Sampling technique

The RDHS for 2019/20 used a Nationally representative sample of households and individuals was selected using a two-stage stratified cluster sampling approach. The sampling frame was constructed using enumeration areas (EAs) from the 2012 population and Housing Census. The EAs were classified by province and urban-rural habitation, followed by district, sector, cell, and hamlet within each stratum. A total of 500 EAs were chosen, with a probability proportionate to size. Households in each selected EA were listed, and 26 households were selected at random for the survey.

Data Collection Instruments
Data extraction method utilizing the DHS data extraction form was employed. This form served as a comprehensive tool to gather relevant information pertaining to contraception uptake and associated factors among adolescents and young women (15-24 years) in Rwanda.

Data analysis
The data extracted from the 2019–2020 RDHS were cleaned to identify and address inconsistencies, missing values, outliers, and potential input errors. The cleaned dataset was initially coded in Microsoft Excel and subsequently the data were imported into Statistical Package for the Social Sciences version 25 for statistical analysis.Descriptive statistics were conducted to summarize key variables. Categorical variables were presented using frequencies and percentages, while continuous variables were summarized using means and SD. Bivariate analyses, including crosstabulations and chi-square tests, were performed to assess associations between contraceptive use and various socio-demographic and economic factors. A significance level of $p < 0.05$ was used to determine statistical significance.Variables that showed significant associations in the bivariate analysis were included in a multivariate logistic regression model to identify factors independently associated with contraceptive uptake, while adjusting for potential confounding variables. The strength and direction of these associations were reported using adjusted odds ratios (aOR) with corresponding 95% confidence intervals.

Ethics
Ethical approval for this study was obtained from the Mount Kenya University Rwanda Ethical Review Board. Permission to access and use secondary data was granted by NISR. The dataset utilized was fully de-identified, and no direct contact with human participants was involved. However, the original data collection adhered to strict ethical standards, including the acquisition of informed consent from all participants at the time of primary data collection.The RDHS 2019/20 employed a standardized and methodologically rigorous approach to data collection, ensuring comprehensive coverage of key demographic and health indicators. The DHS used a structured, pre-tested questionnaire for collecting reliable data on sexual and reproductive wellbeing, contraceptive use, mother, child health, nutrition, and socioeconomic status. The questionnaire was carefully validated to ensure cultural sensitivity, clarity, and the ability to capture context-specific information accurately.

Results:-

Socio-demographic and socio-economic characteristics of respondents

Table 1:- Socio-demographic characteristics of the study participants.

Study variables	Frequency (N)	Percent (%)
Age (years)		
15–19	1675	59.36
20–24	1147	40.64
Marital status		
Single	2,383	84.44
Married	89	15.56
Level of education		
No education	38	1.35
Primary	1,370	48.55
Secondary	1,349	47.8
Higher	65	2.3
Type of place of residence		
Urban	721	25.55
Rural	2,101	74.45
Region in Rwanda		
Kigali	360	12.76
South	655	23.21
West	650	23.03
North	439	15.23
East	718	25.44

Regarding the socio-economic characteristics as presented in table 2, the study shows that about wealth index, the majorityof respondents were in the middle wealth category 1771(62.76%), with most having fewer than two children

2273(80.55%) and living in male-headed households 1872(66.34%). Catholics 1428(50.9%) and Protestants 1277(45.25%) dominated religious affiliations. Awareness of contraceptive use through media was low, but health facilities served as the main source of FP information 1492(52.87%). Most respondents had limited interaction with health facilities 2453(86.92% no visits in the past year) and were unemployed 1971(69.84%). Contraceptive use was minimal, with only 400(14.17%) using contraceptive.

Socio-economic characteristics of the study participants.

Table 2:- Socio-economic characteristics of the study participants.

Study variables	Frequency (N)	Percent (%)
Wealth index categorized		
Poor	794	28.14
Middle	1771	62.76
Rich	257	9.1
Number of children ever born		
< two	2273	80.55
>= two	549	19.45
Household head		
Male	1872	66.34
Female	950	33.66
Religion		
Catholic	1,428	50.9
Protestant	1,277	45.25
Muslim	69	2.45
Others	48	1.7
Heard about FP On Television		
No	2139	75.8
Yes	683	24.2
Visit health facility in the last 12 months		
No	2453	86.92
Yes	369	13.8
Work status		
Not-working	1971	69.84
Working	851	30.16
Heard about FP On Radio		
No	2219	78.63
Yes	603	21.73
Heard about FP on Newspaper/Magazine		
No	2462	87.24
Yes	360	12.76
History of termination of Pregnancy		
No	1969	69.77
Yes	853	30.23
Heard about FP at health facilities		
No	1330	47.13
Yes	1492	52.87
Contraceptive use		
No	2422	85.83
Yes	400	14.17

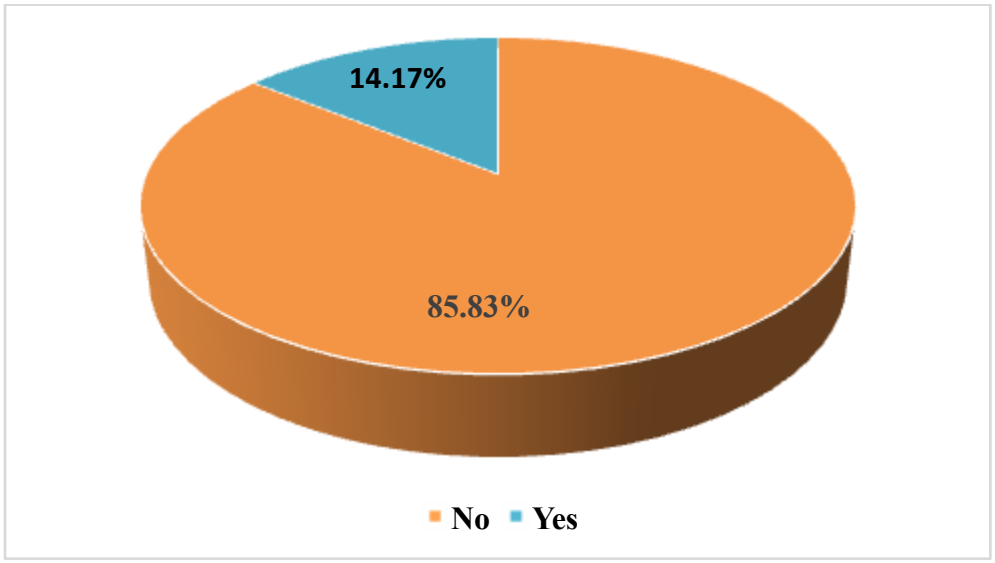

Figure 1:- Prevalence of contraceptive use among the adolescents and young women aged between 15-24 years in Rwanda DHS2019/20.:

The figure 2 presents the prevalence of contraceptive use among the adolescents and young women aged between 15-24 usingRDHS2019/20.Thefindings showedthat 14.17% among them use contraception while a very big percentage 85.83% do not use contraception.

Bivariate analysis of the association between sociodemographic and contraceptive use

Table 3:- Factors associated with contraceptive use among adolescents and young women.

Study variables	Contraceptive use		x^2	P-value
	Yes	No		
	n (%)	n (%)		
Age (years)				
15–19	27(52.94)	1648(59.47)	81.62	**<0.001**
20–24	24(47.06)	1123(40.53)		
Number of children ever born				
< two	21(61.76)	2252(80.77)	9.31	**0.013**
>= two	13(38.24)	536(19.23)		
Level of education				
No education	9(15.00)	29(1.05)	36.18	**<0.001**
Primary	24(40.00)	1346(48.73)		
Secondary	24(40.00)	1325(47.97)		
Higher	3(5.00)	62(2.24)		
Place of residence				
Urban	23(65.71)	698(25.04)	3.08	0.079
Rural	12(34.29)	2089(74.96)		
Region in Rwanda				
Kigali	12(31.58)	348(12.50)	12.22	**0.016**

South	10(26.32)	645(23.17)		
West	6(15.79)	644(23.13)		
North	5(13.16)	434(15.59)		
East	5(13.13)	713(25.61)		
Wealth index categorized				
Poor	7(25.93)	787(28.16)		
Middle	9(33.33)	176263.04)	2.17	0.27
Rich	11(40.74)	2468.80)		
Marital status				
Single	11(78.57)	2372(96.50)	32.67	**<0.001**
Married	3(21.43)	86(3.50)		
Household head				
Male	5(41.67)	1867(66.56)	3.61	0.057
Female	7(58.33)	943(33.56)		
Religion				
Catholic	17(60.71)	1411(50.50)		
Protestant	2(7.14)	1275(45.63)	7.19	**0.033**
Muslim	4(14.29)	65(2.33)		
Others	5(17.86)	43(1.54)		
Heard about FP On Television				
No	3(18.75)	2136(76.12)	2.83	0.673
Yes	13(81.25)	670(23.88)		
Visit health facility in the last 12 months				
No	7(38.89)	2446(87.23)	1.83	0.873
Yes	11(61.11)	358(12.77)		
Work status				
Not-working	6(33.33)	1965(70.08)	4.52	0.0583
Working	12(66.67)	839(29.92)		
Heard about FP On Radio				
No	4(33.33)	2215(78.83)	7.94	**0.049**
Yes	8(66.67)	595(21.17)		
Heard about FP on Newspaper/Magazine				
No	3(30.00)	2459(87.45)	2.86	0.731
Yes	7(70.00)	353(12.55)		
History of Terminating Pregnancy				
No	14(87.50)	1955(69.67)	12.37	**0.018**
Yes	2(12.50)	851(30.33)		
Heard about FP at health facilities				
No	4(36.36)	1326(47.17)	8.26	**0.041**
Yes	7(63.64)	1485(52.83)		

The chi-square test was applied during bivariate analysis to examine the relationship between sociodemographic characteristics and contraceptive use. Theresultsshowthat, Age (P<0.001), Number of children ever born (P=0.013), Level of education (P<0.001), Region in Rwanda (P=0.016), Marital status (P<0.001), Religion (P=0.033), Heard about FP On Radio (P=0.049), History of Terminating Pregnancy (P=0.018), and heard about FP at health facilities (P=0.041), were significantly associated with contraceptive use.

Binary logistic regression to assess the factors associated with contraception uptake

Univariate and Multivariate Analysis for factors associated with contraceptive use, RDHS 2019/2020.

Table 4:- Multivariate analysis to determine the association between study variables and contraceptive use among adolescents' young women aged between 15-24 years.

Study variables	Contraceptive use			
	COR (95%CI)	**p-value**	**AOR (95%CI)**	**p-value**
Maternal age				
15–19	**1.00**		**1.00**	
20–24	3.507(2.17-9.63)	**0.001**	4.88(1.27-18.77)	**0.034**
Region in Rwanda				
Kigali	**1.00**		**1.00**	
South	0.153(0.03-0.793)	**0.025**	0.164(0.017-1.588)	0.118
West	0.056(0.007-0.48)	**0.009**	0.117(0.008-1.688)	0.115
North	0.392(0.104-1.474)	0.166	2.348(0.279-19.781)	0.432
East	0.4(0.122-1.314)	0.131	1.499(0.195-11.501)	0.697
Marital status				
Single	0.145(0.056-0.375)	**<0.001**	0.162(0.035-0.758)	**0.021**
Married	**1.00**		**1.00**	
Number of children ever born				
< two	**1.00**		**1.00**	
>= two	1.453(1.561-3.753)	**0.041**	2.162(3.325-7.358)	**0.021**
Maternal education level				
No education	**1.00**		**1.00**	
Primary	1.141(0.42-3.097)	0.796	2.83(0.57-14.099)	0.203
Secondary	0.14(0.036-0.545)	0.501	0.55(0.063-4.874)	0.595
Higher	4.32(1.59-6.94)	**<0.001**	3.77(3.22-9.71)	**0.002**
Religion				
Catholic	1.69(0.60-4.77)	0.323	3.97(1.06-14.91)	**0.041**
Protestant	**1.00**		**1.00**	
Muslim	2.66(1.09-6.48)	**0.031**	3.04(0.79-11.70)	0.105
Others	0.84(0.27-2.61)	0.768	5.23(0.93-28.55)	0.056
Heard about FP On Radio				
No	**1.00**		**1.00**	
Yes	2.10(3.033-8.32)	**0.005**	0.86(0.076-9.814)	0.905
History of Terminating Pregnancy				
No	1.514(1.054-3.844)	**0.028**	1.85(0.234-14.634)	0.559
Yes	**1.00**		**1.00**	
Heard about FP at health facilities				

No	0.409(0.161-1.039)	0.06	4.86(1.36-7.33)	**0.026**
Yes	**1.00**		**1.00**	

The findings from both univariate and multivariate analyses, highlighted the relationship between the study variables and contraceptive use among adolescent and young women aged 15 to 24 in Rwanda.The analysis with multivariate model, some variables did not show the significant association with contraceptive use, however the respondents with age 20-24 years old (AOR: 4.88, 95% CI: 1.27-18.77)were 4.5 times more likely to use contraception compared to those aged between 20-24 years old. The respondents who were single in marital status (AOR:0.162, 95% CI:0.035-0.758) were less likely to use contraception compared to the young women who were married. The respondent who had greater or equal to two children (AOR:2.162, 95% CI:3.325-7.358) were 2 times more likely to use contraception compared to those who had less than two children. Moreover, the respondents who had higher education level (AOR:3.77, 95% CI:3.22-9.71) were 3.5 times more likely to use contraception compared to those with no education. Additionally, the respondents whose they religion was catholic (AOR: 3.97, 95% CI:1.06-14.91) also were found to be 4 times more likely to use contraception compared to those who were protestants. Furthermore, the participants who have ever heard about contraceptive use at health facilities (AOR:4.86, 95% CI:1.36-7.33) were 5 times more likely to use contraception compared to those who has ever heard about contraceptive use at the health facilities.

Summary of Findings:-

The socio-economic characteristics of females aged 15–24 years reveal key demographic and social trends. Most respondents (59.36%) were aged 15–19 years, and the majority (80.55%) had fewer than two children. In terms of education, nearly half had completed primary (48.55%) or secondary (47.8%) education, while very few had attained higher education (2.3%) or had no formal education (1.35%). Rural residency was predominant (74.45%), and most participants fell into the middle wealth index category (62.76%).Regionally, most participants came from the East (25.44%), South (23.21%), and West (23.03%) regions, while Kigali had the lowest representation (12.76%). A significant majority were single (84.44%), and most lived in male-headed households (66.34%). Catholics formed the largest religious group (50.9%), followed by Protestants (45.25%), while Muslims and other religions were minimally represented.

Awareness of contraceptive use was limited, with most respondents not exposed to FP information via television (75.8%), radio (78.63%), or newspapers/magazines (87.24%). However, health facilities were the primary source of FP information, with 52.87% of respondents hearing about FP through this channel. Despite this, health facility visits were infrequent, as 86.92% reported no visits in the last 12 months.Most respondents (69.84%) were unemployed, and 30.23% had a history of terminating pregnancy. Contraceptive use was notably low, with only 14.17% using contraception, while 85.83% were not using any.

Prevalenc eof contraceptive use

Theprimaryobjectivewastodeterminetheprevalenceofcontraceptive use among adolescents and young women aged between 15-24 years inRwanda. Thefindingsindicatedthat14.17%ofadolescents and young women inthisage groupwereusing contraception. This low prevalence suggests a strong adherence to recommended contraceptive practices among the majority of Rwandan adolescents and young women.

Factors Associated with contraceptive use

The multivariate analysis highlights several factors influencing contraceptive use among young women aged 15–24 years. Women aged 20–24 were more likely to use contraception than younger women. Marital status played a significant role, with married women being more likely to use contraception than single women. Having two or more children and attaining a higher level of education also increased the likelihood of contraceptive use.

Religion influenced usage, as Catholic women were more likely to use contraception compared to Protestant women. Additionally, women who accessed contraceptive use information at health facilities had a higher likelihood of using contraception. These findings emphasize the importance of education, marital status, religion, and access to contraceptive use information in shaping contraceptive use behaviors.

Discussion:-

This study, titled Contraception Uptake and Associated Factors Among Adolescents and Young Women in Rwanda Using 2019/20 RDHS data, revealed a low contraceptive prevalence rate of 14.17% among adolescents and young women aged 15–24 years. This finding aligns with previous studies while also highlighting context-specific factors influencing contraceptive uptake.

The low prevalence of contraceptive use in Rwanda is consistent with a study by Alhassan et al. (2019) in Ghana, which reported an 18% prevalence among women in the same age group. Both studies identified sociocultural barriers like stigma, inaccessibility to contraceptive services, and inadequate knowledge as major contributors to low uptake. However, the Rwandan study emphasized rural-urban disparities, with lower contraceptive use observed in rural provinces (Southern and Western) compared to urban centers like Kigali. In contrast, Alhassan et al. (2019) found that urban residents in Ghana had higher contraceptive uptake, likely due to better access to healthcare and contraceptive education. These differences may stem from varying levels of healthcare infrastructure, public health outreach efforts, and cultural attitudes toward contraception in each country.

Education was a key determinant of contraceptive use. The Rwandan study found that women with higher education levels were significantly more likely to use contraception, a finding supported by Eliason et al. (2022) in Kenya. The Kenyan study further highlighted that male partners' education played a crucial role in contraceptive decisions an aspect not explicitly explored in the Rwandan study. This discrepancy may reflect cultural differences in male involvement in reproductive health, as Kenya has actively promoted male participation in family planning campaigns.

Marital status also influenced contraceptive use, with married women in Rwanda more likely to use contraception than their single counterparts. This finding aligns with Mekonnen and Worku (2015) in Ethiopia, where married women exhibited higher contraceptive uptake due to societal acceptance of contraception within marriage. Additionally, the Ethiopian study emphasized the role of spousal communication in contraceptive decisions, an aspect not covered in the Rwandan study. This gap may suggest differences in data collection or cultural norms regarding marital discussions on contraception.

Religion emerged as a significant factor influencing contraceptive use. In Rwanda, Catholics had higher contraceptive uptake compared to Protestants, contrasting with Gebre et al. (2019) in Uganda, where Catholic women reported lower contraceptive use due to religious opposition to modern contraceptive methods. This difference may be attributed to the Catholic Church's relative flexibility in Rwanda, where some religious leaders support contraceptive use in alignment with public health goals, whereas in Uganda, stricter doctrinal adherence might discourage contraceptive use.

Exposure to contraceptive information significantly increased contraceptive uptake. In Rwanda, women who received contraceptive information at health facilities were five times more likely to use contraception. This finding is consistent with OlaOlorun et al. (2021) in Nigeria, which emphasized the role of healthcare settings as trusted sources of contraceptive education. The similarity suggests that across different regions, health facilities contribute a crucial role in raising awareness and counseling women on contraception.

Overall, the findings of this study are linked to previous research findings on education, marital status, access to information, and religious influence on contraceptive uptake. However, variations in the strength and direction of these associations underscore the importance of context-specific interventions. Differences in sociocultural norms, healthcare infrastructure, public health policies, and community attitudes contribute to these variations. Addressing these factors is essential for designing effective, tailored contraceptive programs.

Despite its contributions, this study is limited in term of the reliance on secondary data from the 2019/20 RDHS restricts the ability to explore certain variables, such as male partner involvement and spousal communication, which have been highlighted in other studies (Eliason et al., 2022; Mekonnen&Worku, 2015). Second, the cross-sectional nature of the data limits the ability to establish causal relationships between factors and contraceptive use. Third, self-reported responses may introduce recall or social desirability bias, particularly on sensitive topics like contraceptive use. Fourth, while the study identifies key determinants, it does not explore deeper sociocultural beliefs and norms influencing contraceptive decisions, which qualitative studies could better address. Lastly, the findings may not be fully generalizable to all Rwandan adolescents and young women, as the study does not account for variations in socioeconomic status beyond the rural-urban divide

Conclusion:-

This study revealed that contraceptive uptake among females aged 15–24 years in Rwanda remains low, with only 14.17% currently using contraception. Several socio-demographic and economic factors significantly influence contraceptive use, including age, marital status, number of children, education level, religion, and access to contraceptive use information.

The socio-economic characteristics of females aged 15–24 years reveal key demographic and social trends. Most respondents (59.36%) were aged 15–19 years, and the majority (80.55%) had fewer than two children.

In terms of education, nearly half had completed primary (48.55%) or secondary (47.8%) education, while very few had attained higher education (2.3%) or had no formal education (1.35%). Rural residency was predominant (74.45%), and most participants fell into the middle wealth index category (62.76%). Regionally, most participants came from the East (25.44%), South (23.21%), and West (23.03%) regions, while Kigali had the lowest representation (12.76%). A significant majority were single (84.44%), and most lived in male-headed households (66.34%). Catholics formed the largest religious group (50.9%), followed by Protestants (45.25%), while Muslims and other religions were minimally represented.

Awareness of contraceptive use was limited, with most respondents not exposed to FP information via television (75.8%), radio (78.63%), or newspapers/magazines (87.24%). However, health facilities were the primary source of FP information, with 52.87% of respondents hearing about FP through this channel. Despite this, health facility visits were infrequent, as 86.92% reported no visits in the last 12 months. Most respondents (69.84%) were unemployed, and 30.23% had a history of terminating pregnancy. Contraceptive use was notably low, with only 14.17% using contraception, while 85.83% were not using any

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Competing interests:

The authors confirm that they have no financial or personal affiliations that could have improperly affected the content of this article.

Author Contributions

Lyse YvannieGirinka led the study design, conducted the literature review, managed the acquisition and analysis of secondary data, interpreted the findings, and wrote the manuscript for publication. Michael Habtu and Monica Mochama provided critical supervision throughout the research process, supported the refinement of the literature review, and contributed to ensuring that the data analysis and interpretation were aligned with the study's objectives and the context of the original data collection.

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Data availability statement

Upon reasonable request, the corresponding author will provide the data that supports this study's findings.

Disclaims

The writers' personal beliefs and viewpoints are reflected in this article, do not necessarily reflect the official policy or position of any affiliated agency of the authors.

List Of Table

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