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Original Research Article

Prevalence and health system predictors of pregnancy among adolescents in Rivercess County, Liberia

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ABSTRACT

Background: Adolescents are becoming pregnant between 10 and 19 years of age. There are 16 million teenage mothers worldwide who give birth every year, accounting for 11% of all births. An estimated 1 in 16 African women experience unintended pregnancy, leading to significant psychosocial consequences, morbidity and mortality. It is estimated that 45% of child births in SSA occur unintentionally among adolescents aged 15-19, while half of unsafe abortions occur among women under 25 years old.
Method: The study employed cross-sectional descriptive analytical design. Total of 425 adolescents recruited from the community consenting /assenting participation. Data were obtained using interview questionnaires, FGD and KII. Descriptive and inferential statistics done using SPSS version 24.0 and Chi-square test was performed at 95% confidence intervals and 0.05 error of precision. Ethical approval obtained from the Liberia Research Ethical Review Board.
Result: Health system factors that were associated with adolescent pregnancy included distance (p=0.001), main source of information (p=0.001), availability of educational materials (0.003), adequacy of services (0.042), availability of adolescent services (p=0.007), ease of accessibility of services (p=0.001), sufficiency of outreach programs (p=0.001) and Health facilities offering variety of contraceptive options for adolescents (p=0.005).
Conclusion: The study found that 30% of adolescents had experienced pregnancy. The study recommends scaled up of comprehensive age specific sex education in schools and provision of SRH services through mobile clinics/ outreach with flexible service delivery times and peer education to allow adolescents to utilize the services.

Keywords: Adolescent pregnancy, Rivercess county, Prevalence, Predictors, Health system factors

INTRODUCTION

An adolescent pregnant woman is a woman who becomes pregnant between the ages of 10 and 19. Adolescence is an extremely important period in a person's life, since people undergo significant changes in their emotional, sexual, cognitive, social and physical well-being. Girls also gain life skills and nutritional knowledge during this time.[1] There are many health concerns associated with adolescent pregnancy, which impact individuals, families and society in general. Adolescent pregnancy may result in severe health and welfare problems for young parents and their children. Teens give birth to 11% of all births around the world each year, which is the leading cause of death among adolescents.[2] It has been identified, several social and cultural factors may lead to teenage pregnancy, such as economic hardship and premature marriages. Moreover, individual characteristics like heavy drinking, challenges in controlling sexual impulses and limited availability of healthcare and contraceptive options are crucial contributors. The lack of comprehensive sex

education worsens the problem.[2] Low-middle-income countries account for almost 10% of adolescent pregnancy fatalities, primarily during adolescent pregnancy. The maternal mortality rate in adolescents is 99% higher due to complications associated with teen pregnancy and childbirth. Typically, it occurs more frequently in single adolescents in developed countries, while in married adolescents in low-middle income countries, it occurs more often.[3] In 2000, the adolescent birth rate (ABR) decreased significantly, according to World Bank statistics. By 2023, this figure has decreased to 41.3 births per 1,000. Nonetheless, the speed of this transformation has differed widely from one region to another. South America and the Caribbean (LAC) and sub-Saharan Africa (SSA) have experienced significant declines, while the southern part has experienced a slow decline. According to estimates, sub-Saharan Africa and Latin America will continue to have the highest birth rates in 2023, with 97.9 births per 1,000 women and 51.4 births per 1,000 women, respectively, despite general declines in many regions. In the year 2023, it was calculated that the global birth rate for adolescence between the ages of 10 and 14 was approximately 1.5 for every 1,000 young females. Sub-Saharan Africa has the highest rate at 4.4, as does Latin America and Caribbean, where it is recorded at 2.3.[4] In Liberia, the DSH 2019 showed that adolescents between the ages of 15-19 31% have already started childbearing.[5]

Due to the lack of health services and lack of trained professionals, adolescents are unable to obtain contraceptive and counseling services. This increases adolescents' chances of becoming pregnant unintentionally.[6] Social stigmas and fears of judgment frequently prevent adolescents from accessing health services, which increase the risk of unintended pregnancy.[7] The lack of coordination between healthcare, educational and social protection systems result in inadequate support for adolescents, exacerbating the risk of adolescent pregnancy.8 With inadequate funding and support, programs aimed at reducing teen pregnancy are significantly less effective and providing reproductive health services in low- and middle-income countries can be challenging.[8]

This study aims to establish the prevalence and health system factors predicators such as source of SRH information, availability SRH services, affordability of SRH services, accessibility SRH services and acceptability of SRH services amongst adolescent pregnancy in Rivercess county, Liberia

METHODS

Study design

In the study, variable characteristics and relationships were described using a cross-sectional descriptive analytical design. Because it collects quantifiable data, this design is perfect for studying the relationship between independent and dependent determinants and we investigated what factors contribute to adolescents becoming pregnant in Rivercess County, Liberia. Duration of the study lasted 13 months (June/2024-July/2025.

Study place

Rivercess County, Liberia, provides a significant backdrop for investigating factors associated with adolescence pregnancy. Covering 4,143 square miles, Rivercess County is one of Liberia's 15 counties and is situated in the southeastern part of the country. It is known for its diverse socio-economic activities, including subsistence farming, logging and small-scale trading. Total population of 90819, with male accounting for 52.5% (47,717) and female 47.5% (43,102). The county is divided into 6 health districts namely: Timbo, Central Rivercess, Doedian, Joe River, Jowein and Yarnee. Jowien and Central Rivercess districts were randomly selected or the study.

Study participants

The study included adolescent girls aged 10-19 living in Rivercess County for at least one year. Minors who whose parent granted permission/consent and the minor who signed assents were included. Those who were aged 18-19 years that consented were included.

Sampling

Rivercess County was purposively selected for the study because it had the highest adolescent pregnancy rates in Country. Rivercess County has 6 health districts. Jowien and Central Rivercess districts were randomly selected for the study using folded pieces of paper. Jowien district has 64 towns while Central Rivercess has 68 towns. Four towns were randomly selected for the study, representing two from each district. Proportionate sampling was used to select households from each district. Respondents were selected from households using systematic random sampling at an interval of 3. The first household were randomly selected using yes/no riffles.

Sample size

Applying the Yamane's formula, a proportionate sampling was done with a total of 386 sample size was obtained through calculation.

Research instrument

Interviews were conducted with adolescents who consented or assented using a structured interview questionnaire. Key informant interview with community leaders, stakeholders and health professionals. A pretesting was carried out in Timbo District in Rivercess County including 43 respondents representing 10% of the sample size.

Data management and analysis

To verify that the keyed data has not been tampered with, it was verified using the statistical package for social sciences version 24 with the appropriate codes and variables. Descriptive and inferential statistics done using SPSS version 24.0. Chi-square test was performed to determine the association between independent and dependent variables at 95% confidence intervals and 0.05 error of precision. Further statistical rigor analysis was done by determining the key predictors for teenage pregnancy. This was done by running those variables that will be significant at chi-square through logistic regression analysis.

Logistical and ethical consideration

This study was approved and authorized by Kenyatta University Graduate School, approved by a review committee at Kenyatta University and approved by Rivercess County administration before conducting the study. A consent from the Government of Liberia's Ministry of Health, as well as the Liberia's National Research Ethics Board (University of Liberia Institutional Review Board), was also acquired. To conduct the study the researcher also obtained permission from local authorities. The respondents 10 to 17 years parents or caregiver gave a permission, sign an informed consent for their child's participation and an informed assent from the minor was obtained; while adolescents 18 to 19 years informed consent was sought.

RESULTS

Results on adolescent pregnancy revealed that majority 277 (70.0%) of the respondents had never been pregnant while the rest 121 (30.0%) had ever been pregnant). Adolescents through a focused group discussion acknowledged the high prevalence of pregnancy and attributed it to lack of knowledge and risky sexual behaviours.

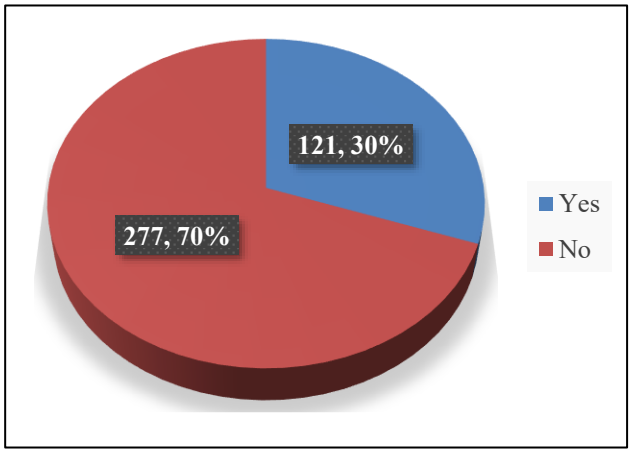

Figure 1: Results on adolescent pregnancy.

Age of pregnancy

Further results revealed that among those who had ever been pregnant, majority 77 (63.9%) became pregnant aged between 15-17 years followed by 26 (21.5%) who were pregnant at the age of 16-14 years. Results were as presented in Table 1.

Outcome of pregnancy

Concerning the outcome of pregnancy, more than half 70 (57.8%) had a live birth followed by 41 (33.9%) who were still pregnant at the time of data collection. Results were as presented in Table 2.

Health system factors

Distribution of health system factors

Results on distribution of health system factors revealed that 167 (42.0%) of the respondents' approximate distance to the nearest adolescent and youth friendly center/health facility was between 5-15 kilometers followed by 164 (41.2%) whose distance was less than 5 kilometers. More than half 221 (55.5%) of the respondents picked health care providers as their main source information on sexual and reproductive health followed by 51 (12.8%) who got information from friends. Slightly above half 201 (50.5%) indicated that there were educational materials on reproductive health at the facility followed by 117 (29.4%) who reported unavailability of the materials.

Concerning availability of adequate reproductive health services in the facility, most 370 (93.0%) agreed followed by 18 (4.5%) who disagreed. Most 247 (62.1%) of the respondents agreed that there were adolescent and youth friendly services in the community while the rest 151 (37.9%) indicated they weren't available. Concerning ease of accessibility of adolescent and youth services, 329 (82.7%) believed they were easily available while the rest 69 (17.3%) felt they weren't. Majority 256 (64.3%) of the respondents revealed that outreach programs on promoting reproductive health awareness were not sufficient followed by 142 (35.7%) who reported they were sufficient.

On health facility offering variety of contraceptive options for adolescents 332 (83.4%) agreed followed by 36 (9.0%) who could not tell. Most 248 (62.3%) of the respondents felt that the attitude of health care providers was good the last time they visited the facility followed by 88 (22.1%) who reported a fair attitude. Concerning service provision considering privacy and confidentiality 254 (63.8%) agreed followed by 75 (18.8%) who could not tell. Majority 287 (72.1%) of the respondents agreed that contraceptives were available all the time in the facility followed by 68 (17.1%) who could not tell.

Majority 301 (75.7%) of the respondents insinuated that staff were available to offer adolescent services all the time followed by 67 (16.8%) who could not tell. Concerning staff availability to avail information about counseling on sexual and reproductive health issues, 266 (66.8%) agreed followed by 93 (23.4%) who could not tell. The results were as presented in Table.

Table three results showed that 59 (88.1%) of those whose distance to the nearest adolescent friendly center/health facility was more than 15 kilometres had never been pregnant. There was a significant statistical association between approximate distance to nearest adolescent friendly center/health facility and adolescent pregnancy (p=0.001). Most 172 (77.8%) of the respondents whose main source of information on sexual and reproductive health was health care providers had never been pregnant.

Association between health system factors and adolescent pregnancy

Health system factors were associated with adolescent pregnancy. Results showed that 59 (88.1%) of those whose distance to the nearest adolescent friendly center/health facility was more than 15 kilometers had never been pregnant. There was a significant statistical association between approximate distance to nearest adolescent friendly center/health facility and adolescent pregnancy (p=0.001). Most 172 (77.8%) of the respondents whose main source of information on sexual and reproductive health was health care providers had never been pregnant. There was a significant statistical association between main source of information on sexual and reproductive health and adolescent pregnancy (p=0.001).

Majority 152 (75.6%) of the respondents who agreed that educational materials on reproductive health were available at the facility had never been pregnant. Availability of educational materials on reproductive health at the facility was significantly associated with adolescent pregnancy (p=0.003). Concerning adequacy of reproductive health services in the facility, 10 (100.0%) of those who could not tell had never been pregnant. However, adequacy of reproductive health services in the facility was significantly associated with adolescent pregnancy (p=0.042). Most 117 (77.5%) of the respondents who indicated adolescent and youth friendly services were not available in the community had never been pregnant. There was a significant statistical association between availability of adolescent and youth friendly services in the community and adolescent pregnancy (p=0.007).

Concerning the ease of accessibility of adolescent and youth services, 61 (88.4%) of those who disagreed had never been pregnant. Ease of accessibility of adolescent and youth services was significantly associated with adolescent pregnancy (p=0.001). Majority 117 (82.4%) of the respondents who indicated that the outreach programs promoting RH awareness were sufficiency had never been pregnant. Sufficiency of outreach programs promoting RH awareness was significantly associated with adolescent pregnancy (p=0.001).

Further results revealed that 30 (83.3%) of the respondents who could not tell whether health facilities were offering variety of contraceptive options for adolescents had never been pregnant. There was a significant statistical association between health facilities offering variety of contraceptive options for adolescents and adolescent pregnancy (p=0.005). A nurse in charge of a facility also noted that there were contraceptive options in the facility but very few adolescents and youths were utilizing them.

Health system predictors for adolescent pregnancy

Health system factors were regressed with adolescent pregnancy. Adolescents whose distance to the nearest facility was more than 15 kilometres were less likely to be pregnant and the association was significant (AOR 0.401, 95% CI, 0.206-0.779, p=0.007). Adolescents whose main source of information on sexual and reproductive health was health care providers were less likely to report a pregnancy, but the association was not significant (AOR 0.389, 95% CI, 0.120-1.258, p=0.115).

Those respondents who indicated that educational materials on reproductive health were available at the facility were more likely to become pregnant, but the association was not significant (AOR 1.078, 95% CI, 0.548-2.120, p=0.827). Concerning adequacy of reproductive health services in the facility, those who disagreed were less likely to report an adolescent pregnancy, but the association was not significant (AOR 0.707, 95% CI, 0.001-0.112, p=0.626). Respondents who insinuated that adolescent and youth friendly services were available were less likely to have an adolescent pregnancy, but the association was not significant (AOR 0.121, 95% CI, 0.332-0.001, p=0.999).

Concerning the ease of accessibility of adolescent and youth services results revealed that those who agreed were more likely to have an adolescent pregnancy and the association was significant (AOR 3.096, 95% CI, 1.601-5.986, p=0.001).

Respondents who reported that outreach programs promoting reproductive health awareness were sufficient were less likely to report an adolescent pregnancy and the association was significant (AOR 0.666, 95% CI, 1.599-4.878, p=0.001). Respondents who agreed that health facilities were offering variety of contraceptive options for adolescents were more likely to be pregnant at adolescence, but the association was not significant (AOR 1.381, 95% CI, 0.460-4.141, p=0.565).

Table 1: Age of pregnancy (n=121).

Age of pregnancy (in years)	Frequency (N)	(%)
10-14	26	21.5
15-17	77	63.6
18-19	18	14.9

Table 2: Outcome of pregnancy (n=121).

Outcome of pregnancy	Frequency (N)	(%)
Live birth	70	57.8
Still birth/ Miscarriage/ Induced abortion	10	8.3
Still pregnant	41	33.9

Table 3: Distribution of health factors among respondents (n=398).

Variable	Respondent response	Frequency (N)	(%)
Approximate distance to nearest adolescent and youth friendly centre/health facility (in Kms)	<5	164	41.2
	5-15	167	42.0
	>15	67	16.8
Main source of information on sexual and reproductive health	Health care providers	221	55.5
	Social media	23	5.8
	Other media e.g., Radio, TV, magazines, Newspapers	48	12.1
	Friends	51	12.8
	Religious leaders	35	8.8
	Family members	20	5.0
Are educational materials on reproductive health available at the facility	Yes	201	50.5
	No	117	29.4
	Can not tell	80	20.1
Are there adequate reproductive health services in the facility	Yes	370	93.0
	No	18	4.5
	Can not tell	10	2.5
Availability of adolescent and youth friendly services in the community	Yes	247	62.1
	No	151	37.9
Ease of accessibility of adolescent and youth services	Yes	329	82.7
	No	69	17.3
Sufficiency of outreach programs promoting RH awareness	Yes	142	35.7
	No	256	64.3
Health facilities offering variety of contraceptive options for adolescents	Yes	332	83.4
	No	30	7.5
	Can not tell	36	9.0
Attitude of health care providers last time visited a facility	Good	248	62.3
	Fair	88	22.1
	Poor	62	15.6
Does service provision consider privacy and confidentiality?	Yes	254	63.8
	No	69	17.2
	Can not tell	75	18.8
Are contraceptives available all the time in the facility?	Yes	287	72.1
	No	43	10.8
	Can not tell	68	17.1
Are there staff available to always offer adolescents services?	Yes	301	75.7
	No	30	7.5
	Can not tell	67	16.8
Are staff able to avail information about counselling on SRH?	Yes	266	66.8
	No	39	9.8
	Can not tell	93	23.4

Table 4: Association between health system factors and adolescent pregnancy among respondents (n=398).

Variable	Respondent response	Frequency (N)	Adolescent pregnancy		Statistical significance
			Yes	No	
Approximate distance to nearest adolescent friendly center/facility (kms)	<5	164 (41.2%)	37 (22.6%)	127 (77.4%)	$\chi2$=33.570 df=2 p=0.001
	5-15	167 (42.0%)	76 (45.5%)	91 (54.5%)	
	>15	67 (16.8%)	8 (11.9%)	59 (88.1%)	
Main source of information on sexual and reproductive health	Health care providers	221 (55.5%)	49 (22.2%)	172 (77.8%)	$\chi2$=21.087 df=5 p=0.001
	Social media	23 (5.8%)	12 (52.2%)	11 (47.8%)	
	Other media e.g., Radio, TV, magazines, Newspapers	48 (12.1%)	21 (43.8%)	27 (56.2%)	
	Friends	51 (12.8%)	19 (37.3%)	32 (62.7%)	
	Religious leaders	35 (8.8%)	10 (28.6%)	25 (71.4%)	
	Family members	20 (5.0%)	10 (50.0%)	10 (50.0%)	
Are educational materials on reproductive health available at the facility	Yes	201 (50.5%)	49 (24.4%)	152 (75.6%)	$\chi2$=11.512 df=2 p=0.003
	No	117 (29.4%)	36 (30.8%)	81 (69.2%)	
	Can not tell	80 (20.1%)	36 (45.0%)	44 (55.0%)	
Are there adequate reproductive health services in the facility	Yes	370 (93.0%)	118 (31.9%	252 (68.1%)	Fisher's exact test df=2; p=0.042
	No	18 (4.5%)	3 (16.7%)	15 (83.3%)	
	Can not tell	10 (2.5%)	0 (0.0%)	10 (100.0%)	
Availability of adolescent and youth friendly services in the community	Yes	247 (62.1%)	87 (35.2%)	160 (64.8%)	$\chi2$=7.150 df=1 p=0.007
	No	151 (37.9%)	34 (22.5%)	117 (77.5%)	
Ease of accessibility of adolescent and youth services	Yes	329 (82.7%)	113 (34.3%	216 (65.7%)	$\chi2$=13.954 df=1 p=0.001
	No	69 (17.3%)	8 (11.6%)	61 (88.4%)	
Sufficiency of outreach programs promoting RH awareness	Yes	142 (35.7%)	25 (17.6%)	117 (82.4%)	$\chi2$=17.085 df=1; p=0.001
	No	256 (64.3%)	96 (37.5%)	160 (62.5%)	
Health facilities offering variety of contraceptive options for adolescents	Yes	332 (83.4%)	99 (29.8%)	233 (70.2%)	$\chi2$=10.719 df=2 p=0.005
	No	30 (7.5%)	16 (53.3%)	14 (46.7%)	
	Can not tell	36 (9.0%)	6 (16.7%)	30 (83.3%)	
Attitude of health care providers last time visited a facility	Good	248 (62.3%)	76 (30.6%)	172 (69.4%)	$\chi2$=5.340 df=2 p=0.069
	Fair	88 (22.1%)	20 (22.7%)	68 (77.3%)	
	Poor	62 (15.6%)	25 (40.3%)	37 (59.7%)	
Do service provision consider privacy and confidentiality	Yes	254 (63.8%)	71 (28.0%)	183 (72.0%)	$\chi2$=1.991 df=2 p=0.370
	No	69 (17.2%)	24 (34.8%)	45 (65.2%)	
	Can not tell	75 (18.8%)	26 (34.7%)	49 (65.3%)	
Are contraceptives available all the time in the facility	Yes	287 (72.1%)	84 (29.3%)	203 (70.7%)	$\chi2$=0.645 df=2 p=0.724
	No	43 (10.8%)	14 (32.6%)	29 (67.4%)	
	Can not tell	68 (17.1%)	23 (33.8%)	45 (66.2%)	
Are there staff available to always offer adolescents services?	Yes	301 (75.7%)	91 (30.2%)	210 (69.8%)	$\chi2$=0.389 df=2 p=0.823
	No	30 (7.5%)	8 (26.7%)	22 (73.3%)	
	Can not tell	67 (16.8%)	22 (32.8%)	45 (67.2%)	
Are staff able to avail information about counselling on SRH?	Yes	266 (66.8%)	83 (31.2%)	183 (68.8%)	$\chi2$=0.252 df=2 p=0.882
	No	39 (9.8%)	11 (28.2%)	28 (71.8%)	
	Can not tell	93 (23.4%)	27 (29.0%)	66 (71.0%)	

Table 5: Logistic regression of factors associated with Adolescent pregnancy.

Independent variable	Category	B	S.E.	Wald	Sig.	AOR	95% C.I. for AOR	
							Lower	Upper
Approximate distance to nearest	<5	Reference						
	5-15	18.644	26898.96	0.001	0.999	1249.2	0.000	

Continued.

Independent variable	Category	B	S.E.	Wald	Sig.	AOR	95% C.I. for AOR	
							Lower	Upper
adolescent friendly center (km)	>15	-0.914	0.339	7.282	0.007*	0.401	0.206	0.779
Main source of information on sexual and reproductive health	Family members	Reference						
	Friends	-0.192	0.731	0.069	0.793	1.211	0.289	5.077
	HCPs	-0.945	0.599	2.486	0.115	0.389	0.120	1.258
	Other media	-0.851	0.576	2.182	0.140	0.427	0.138	1.321
	Religious leaders	0.001	0.612	0.001	1.000	1.000	0.301	3.319
	Social media	-0.669	0.697	0.919	0.338	0.512	0.131	2.010
Are educational materials on reproductive health available at the facility	Can not tell	Reference						
	No	0.089	0.367	0.059	0.808	1.093	0.532	2.246
	Yes	0.075	0.345	0.048	0.827	1.078	0.548	2.120
Are there adequate reproductive health services in the facility	Can't tell	Reference						
	No	-19.870	12327.18	0.001	0.999	0.001	0.001	0.112
	Yes	-0.346	0.710	0.238	0.626	0.707	0.176	2.844
Availability of adolescent and youth friendly services	No	References						
	Yes	-19.990	26898.96	0.001	0.999	0.001	0.121	0.332
Ease of accessibility of adolescent and youth services	No	References						
	Yes	1.130	0.336	11.28	0.001*	3.096	1.601	5.986
Sufficiency of outreach programs promoting RH	No	References						
	Yes	0.001	0.002	0.813	0.001*	0.666	1.599	4.878
Health facilities offering variety of contraceptive options for adolescents	Can't tell	References						
	No	0.322	0.560	0.331	0.565	1.381	0.460	4.141
	Yes	0.365	0.495	0.541	0.461	1.440	0.546	3.797

*Statistically significant.

DISCUSSION

Adolescent pregnancy

The findings reveal that majority had never been pregnancy this may be attributed to several protective factors, including increased access to sexual and reproductive health education, delayed sexual debut and the use of modern contraceptives. Additionally, sociocultural and familial influences could contribute to the lower rates of pregnancy among the majority. Adolescents who receive strong parental guidance, live in communities with low tolerance for teenage pregnancy or come from households with higher socio-economic status are more likely to avoid early childbearing. However, the finding was not in agreement with previous studies that report high rates of adolescent pregnancies in Sub-Saharan Africa, often driven by early sexual debut, low contraceptive use and socio-economic vulnerabilities.[9,10]

Further results revealed that among those who had ever been pregnant, the majority of these pregnancies occurred between the ages of 15–17 years. This suggests that this period can be marked by limited access to reproductive health education and services, making adolescents highly susceptible to unplanned pregnancies. This age group also falls within the period when many adolescents begin to transition into adulthood, often without adequate guidance or access to reproductive health information and services. The findings were in agreement with other studies which states that adolescents aged 15–17 are more likely to engage in exploratory sexual behavior due to peer pressure, romantic relationships and limited supervision, especially if they are in or out of secondary school.[11,12]

Regarding pregnancy outcomes, the data shows that most adolescent pregnancies resulted in live births. This suggests a sustained trend of early motherhood among

adolescents, which has been associated with increased risk of school dropout, economic hardship and poor maternal and child health outcomes. This was consistent with several studies conducted in SSA, which report that a majority of adolescent pregnancies are carried to term due to limited access to safe abortion services and strong sociocultural norms favoring childbirth, even among teenagers. For example, a study found that in many low- and middle-income settlements, adolescents often continue with their pregnancies because of restrictive abortion laws or fear of stigma.[12] Similarly reported, a high rate of adolescent live births, indicating a regional trend that aligns with the current study's findings.[13]

Health system predictors for adolescent pregnancy

Health system factors were regressed with adolescent pregnancy. Adolescents whose distance to the nearest facility was more than 15 kilometers were less likely to be pregnant as an adolescent and the association was significant suggesting that greater distance to a health facility may serve as a deterrent to early sexual activity or reduce access to services that might facilitate early sexual engagement, although further investigation is needed to unpack the mechanisms behind this association. The finding aligns with studies which found that proximity to health facilities was associated with increased access to reproductive health services, but also with higher likelihood of risk behavior among urban youth.[14] Similarly reported that, adolescents in peri-urban areas were more likely to access family planning services but also had higher rates of sexual activity due to peer influence and media exposure.[15]

In terms of adolescents whose main source of information on sexual and reproductive health was health care providers were less likely to report an adolescent pregnancy, but the association was not significant, the trend suggests that health professionals may play a protective role in preventing early pregnancies. This aligns with findings which emphasized that adolescents who receive SRH information from trusted sources such as health care providers tend to have improved knowledge and are more likely to adopt safer sexual practices.[15] Similarly, a study reported that engagement with health facilities and trained personnel enhances adolescent access to contraceptive counseling, which can reduce unintended pregnancies.[14] Regarding accessibility of educational materials on reproductive health, those respondents who indicated that educational materials on reproductive health were available at the facility were more likely to become pregnant, but the association was not significant demonstrating that the mere presence of educational content does not guarantee behavior change, especially if the materials are not youth-friendly, culturally appropriate or effectively disseminated. This finding aligns with observations that noted access to SRH information must be accompanied by adolescent-sensitive delivery approaches to be effective.[16] Quality and contextual relevance of reproductive health materials significantly affect their impact on adolescent knowledge and behavior.[17]

Concerning adequacy of reproductive health services in the facility, those who disagreed were less likely to report an adolescent pregnancy, but the association was not significant suggesting that perception of inadequacy in reproductive health services may not directly influence pregnancy outcomes, due to other factors such as personal values, family involvement or access to alternative sources of information and services. However, there was lack of statistical significance also indicating that perceived services adequacy alone may be insufficient to predict adolescent risk. The findings are in line with a study stated that structural quality must be accompanied by adolescent centered services delivery to impact sexual and reproductive health outcomes meaningfully.[16]

In relation to availability of adolescent and youth friendly services, respondents who insinuated that adolescent and youth friendly services were available were less likely to have an adolescent pregnancy, but the association was not significant, highlighting that the availability of youth friendly services alone many are not sufficient to influence adolescent pregnancy outcomes. This points to gaps in the implementation quality services awareness or utilization levels of such services. The findings agree with others study which emphasized that the effectiveness of youth-friendly services depends not only on their presence but also on how accessible, acceptable and tailored they are to adolescents' unique needs and contexts.[15,17]

Concerning the ease of accessibility of adolescent and youth services results revealed that those who agreed were more likely to have an adolescent pregnancy and the association was significant indicating that while services are accessible, they may lack preventive focus, fail to address root behavioral causes or may not be accompanied by adequate counseling and follow-up. This observation underscores the argument by other researchers that the mere physical accessibility of reproductive health services is insufficient unless the services are adolescent centered, comprehensive and effective in addressing the broader socio-behavior context of adolescent sexuality.[15,17]

When it comes to outreach programs promoting reproductive health awareness, respondents who reported that outreach programs promoting reproductive health awareness were sufficient were less likely to report an adolescent pregnancy and the association was significant suggesting that effective outreach initiatives likely increased awareness about contraception, consequences of early pregnancies and available youth-friendly services. These findings support earlier studies which emphasized that community-based awareness efforts, particularly those targeting adolescents through schools, peer education and local campaigns, are instrumental in improving reproductive health outcomes.[18,19]

In terms of contraceptive services, respondents who agreed that health facilities offered a variety of contraceptive options for adolescents were more likely to have experienced adolescent pregnancy, although the association was not statistically significant. This highlights that several factors may contribute to this outcome, including inadequate adolescent-specific counseling, stigma in accessing services, misinformation or inconsistent use of contraceptives. The finding aligns with previous studies which emphasize that access to contraceptive options alone is insufficient unless such services are adolescent-friendly, culturally appropriate and complemented by continuous education and behavior change interventions.[15,17]

The topic under discussion is often sensitive and considered a taboo in the context of rural Liberia and with it further probing into the privacy; some participant felt the need not to share about undesirable family information.

CONCLUSION

The study found that 30% of adolescents had experienced pregnancy. The study further concluded that health system factors also predicted occurrence of adolescent pregnancy such as distance to facility health facility (AOR=0.401, p=0.007), perceived ease of accessing adolescent services (AOR=3.096, p=0.001) and presence of sufficient outreach programs (AOR=0.666, p=0.001). The study recommends outreach programs to be scaled up, comprehensive age specific sex education in schools and provision of SRH services through mobile clinics and flexible times and peer education to allow adolescents to utilize the services. A further study should be considered on the effectiveness of adolescent friendly services on the prevalence of adolescent pregnancy.

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