BMJ Public Health

Prevalence of unplanned first pregnancy and socioeconomic factors in Benin: a cross-sectional and analytical study

Mahouli Mireille-Marie Mintogbe ,[1,2] Elihou Adje,[2]
Victorien Tamègnon Dougnon,[3] Clément Ahoussinou,[1] Mouftaou Amadou Sanni[2]

To cite: Mintogbe MM-M, Adje E, Dougnon VT, *et al*. Prevalence of unplanned first pregnancy and socioeconomic factors in Benin: a cross-sectional and analytical study. *BMJ Public Health* 2024;**2**:e000878. doi:10.1136/bmjph-2023-000878

► Additional supplemental material is published online only. To view, please visit the journal online (https://doi.org/10.1136/bmjph-2023-000878).

Received 26 December 2023
Accepted 8 October 2024

[1]INstitut d'Analyse de Communication et des Ensembles Sociaux (INACES), Akpro-Missérété, Benin
[2]Laboratoire de Recherche en Sciences de la Population et du Développement (LaReSPD) of Université de Parakou, Parakou, Benin
[3]Université de Abomey Calavi (UAC), Abomey-Calavi, Benin

Correspondence to
Dr Mahouli Mireille-Marie Mintogbe;
clema.mintogbe@gmail.com

ABSTRACT

Background Early or unplanned pregnancy is an obstacle to the well-being of adolescent girls, especially as early motherhood has health and social consequences on the young mother and the newborn. This also negatively impacts maternal and infant morbidity and mortality. The aim of this study is to determine the prevalence of unplanned first pregnancies and the explanatory factors among adolescent girls.

Methods Data were collected from a sample of 738 adolescent girls aged 15–19 years in the 12 departments of Benin. Analyses focused on teenagers who were pregnant for the first time or had at least one child at the time of the survey (337 individuals). Descriptive and bivariate analyses and logistic regression were used.

Results The prevalence of unplanned first pregnancies was 80.1% (n=270). The frequency of unplanned first pregnancies was higher among adolescents who had reached secondary school or higher (85.7%, p=0.027), those who had spent their socialisation period in big cities (88.5%, p=0.018) and those whose financial needs were not met (84.8%, p=0.014). The main explanatory factor identified was unmet financial needs. Indeed, adolescents with unmet financial needs were 1.7 times (p=0.041) more likely to have an unplanned first pregnancy than those whose needs were met.

Conclusion Multisectoral interventions are needed to reduce the prevalence of unplanned first pregnancies, which can compromise adolescent girls' academic and career plans. These interventions could focus on sexual and reproductive health education, girl empowerment, improvement of households' socioeconomic conditions, etc.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Many studies have focused on early and unplanned pregnancies, but it is not known if this is first pregnancy or not.
⇒ Most previous work has shown that rural and unschooled adolescent girls are more likely to have unplanned pregnancies.

WHAT THIS STUDY ADDS

⇒ This study focuses on unplanned first pregnancy. This provides a better understanding of several socio-health issues faced by adolescent girls, such as : clandestine abortions, limited access to or unmet need for contraceptive services, low kowledge in sexuel and repeoductive health, etc.
⇒ Adolescent girls with secondary education or higher and those who spent their socialisation period in big cities have a higher probability of having an unplanned first pregnancy compared with others.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Based on the factual data contained from the study, multisectoral interventions that effectively and sustainably contribute to reducing unplanned first pregnancies should be initiated.
⇒ Results of the study will help to improve multisectoral interventions for adolescent and young girls (education, sexual and reproductive health). Particulary, they will improve access to modern contraceptive methods for those who want them, promote girl's empowerment and improve access to employment and income-generating activities for those who have plans for future, etc.

INTRODUCTION

According to many studies,[1–4] unplanned or early pregnancies have health, socioeconomic and demographic consequences on adolescent girls. On the health front, they increase the risk of induced and clandestine abortions, obstetric complications during abortions performed in inappropriate conditions and adolescent deaths.[5 6]

Adolescent and youth reproductive health (AYRH) issues have become a global priority since 1990, after the International Conference on Population and Development (ICPD) in Cairo in 1994 and the African Forum on Adolescent Reproductive Health in Addis Ababa in 1998. The main objective of the ICPD, the first international forum on AYRH, was to create a favourable setting for adolescents and young people that enables them to (1) access information and services for responsible sexuality, (2) prevent unplanned

and/or early pregnancies, (3) access modern contraception services and (4) access information on the prevention and treatment of sexually transmitted infections (STIs) and AIDS.[7] Thus, AYRH was one of the priorities of the Millennium Development Goals, which expired in 2015, and is currently one of the Sustainable Development Goals (SDGs) in relation to health.

Other measures have been taken at the regional level to promote sexual and reproductive health (SRH) rights among adolescents and young people. These include (1) the African Youth Charter in 2006; (2) the Maputo Action Plan in 2006; (3) the Ouagadougou Partnership in 2011; and (4) the Family Planning 2020 partnership launched in London in 2012, which aims to ensure that 120 million women and girls in 69 developing countries, including Benin, have voluntary access to modern contraception by 2020, etc. To achieve the objectives arising from these various international and regional assizes to which Benin has subscribed, a policy, legal and programmatic framework on reproductive health has been implemented for several decades and is reflected in the intensification of comprehensive programmes and interventions on AYRH in Benin.[8 9]

Interventions and actions in favour of AYRH in Benin have seen the participation of many multisectoral actors and partners from government institutions, civil society organisations and bilateral and multilateral partners, such as Plan International Benin, United Nations Population Fund, United Nations International Children's Emergency Fund, United Nations Educational, Scientific and Cultural Organisation, Worl Health Organisation, World Bank, United States Agency for Inernational Development, non-governmental organisations, etc.[10] By way of illustration, Plan International Benin, as part of the project on promoting AYRH rights in 120 communities in Benin, has set up (1) listening centres, (2) youth-friendly centres and (3) initiatives for the benefit of adolescents and young people in schools (training by peer educators, etc). The ABPF (Association Béninoise pour la Promotion de la Famille) is also involved in several projects such as 'Promoting sexual and reproductive health among adolescents and young people in Benin'. The PSI/ABMS (Population Services International/Association Béninoise pour le Marketing Social et la communication pour la Santé), through the 'Love and life more' project, has set up 'Love and life' centres and centres for listening, advice and guidance on SRH, as well as family planning services, etc. The BUPDOS-ONG (Bureau des Projets de Développement et des Œuvres Sociales) is also involved in the 'Prevention of STIs, HIV and AIDS among adolescents and young people' project and in the 'Programme de la Santé Reproductive et Droits Sexuels des Adolescents et Jeunes (PMA-SRDSAJ)'. APESSA-Bénin (Association pour l'Education, la Sexualité et la Santé en Afrique) also implements comprehensive interventions on sexuality education in school and out-of-school settings and through the media for the benefit of adolescents and young people, etc.

Despite this legislative and programmatic environment, the fifth edition of the Demographic and Health Survey (DHS) showed that the rate of use of modern contraceptive methods among teenagers (aged 15–19 years) is only 5.6%. Among 10 sexually active adolescents not in union, approximately 7 (65.5%) have unmet needs.[11] The results of the seventh edition of Benin's Second Generation Surveillance Survey showed that, among sexually active adolescents and young people aged 15–24 years, 11.0% (296 out of 2703) had their first sexual intercourse before the age of 15 years and 43.7% (1180 out of 2703) between the ages of 15 and 17 years. Among the latter, 4 out of 10 (39.3%) used condom the last time they had sex. There was no significant difference in condom use between girls and boys (39.7% vs 38.9%, p=0.663) and no difference between those 15–19 years old and those 20–24 years old (37.7% vs 40.5%, p=0.135).[12]

The environment described here highlights the importance of interventions undertaken to improve the level of SRH among adolescents and young people. At the same time, this background reveals the persistence of risky sexual behaviours that favour early pregnancy and maternity, with adolescent girls being the most vulnerable. One of the consequences of early pregnancy is clandestine abortion, which increases the risk of death and obstetric complications. The probabilities are higher when pregnancy is unplanned or unwanted. Indeed, it was found in Benin that, among 296 sexually active female students (aged between 15 and 31 years) who had unwanted pregnancies, two-thirds (66.7%) had an abortion.[13] Another study carried out in four referral hospitals in Benin showed that, out of 69 abortions recorded, 60.9% (n=42) involved unmarried adolescents and girls aged 18–24 years. In this same study, maternal death audits conducted in the hospitals revealed 14.6% of deaths were due to induced abortions and use of non-recommended methods.[14]

Unlike previous studies, this study focuses on unplanned first pregnancies as teenage girls mark the beginning of their reproductive life, compromising their future plans and dreams. The personal, moral, health, social and family implications are such that some teenagers resort to clandestine abortions, putting their lives at risk. This context compromises achievement of SDG target 3.7 on sexual and reproductive health. The aim of this study is to contribute to a better understanding of the scale and the factors associated with unplanned first pregnancies in Benin, with a view of encouraging evidence-based decision-making, measures and actions.

MATERIALS AND METHODS

Data and study framework

The data used in this study were from a quantitative survey of adolescent fertility conducted from 20 May to 30 May 2019 among adolescent girls aged 15–19 years in the 12 departments of Benin.

Sample

The overall sample size of 738 was determined using the Schwartz formula for cross-sectional studies. This formula was appropriate for this type of study and made it possible to determine an adequate sample size to obtain accurate and reliable estimates of the prevalence of unplanned first pregnancies.

The occurrence related to adolescent fertility was that estimated in 2017 by the fifth edition of Benin's DHS, which is at 20.0%. For this study, condidence interval is 95% and significance level set at 5%, along with a 10% increase for non-responses. The following formula was used:

$$n = \frac{Z_{\alpha}^{2} p(1-p)}{i^{2}} D$$

In above formula, "n" indicates the sample size; Z_{α} is reduced deviation for an α risk of 5%, which is equal to 1.96; p is the national prevalence of fertility among adolescent girls estimated from the 2017 DHS in Benin, which is equal to 20%; i is the estimated precision, which is equal to 5%; and D is the design effect, which is equal to 2.

This study covered rural and urban areas in the 12 departments of Benin. In each department, sampling of statistical units was stratified at four levels: municipalities, districts, neighbourhoods/villages and among adolescent girls aged 15–19 years.

Collection tools and techniques

Data were collected using a questionnaire structured into several sections relating to participants' sociodemographic characteristics, family life and management of financial needs, communication and participation in social activities, SRH, and partner characteristics. The data collection technique used was semistructured interviews conducted in a setting that gave participants confidence and that took account auditory and visual confidentiality. The questionnaire was digitised and incorporated on tablets using the KoBoCollect online collection application.

Ethical measures

Signed informed consent was obtained from each adolescent prior to the interviews. Parental consent was not required for the minors surveyed (ie, those aged between 15 and 17 years) given the subject's sensitivity and the status of the study population. In accordance with Beninese legislation on the subject, coupled with the guidelines of Benin's health ethics committee, pregnant teenagers or those with at least one child, as well as married teenagers, are often considered emancipated minors. Parental consent is therefore no longer required prior to their involvement in surveys.

According to the Sex And Gender Equity in Research (SAGER) guidelines,[15] sex and gender are not relevant to the subject of this study, which is directly oriented towards adolescent girls and therefore female people. As the study group was therefore made up of girls likely to be pregnant or to have at least one child at the time of data collection, questions about sex and gender were not asked (online supplemental appendix 1).

Variables

Two types of variables were studied: dependent variable and explanatory variables. Dependent variable is 'planning first pregnancy', data for which were obtained by asking all eligible participants (ie, those who have started their reproductive life: already have at least one live birth or were pregnant for the first time during the survey) the following question: 'When you became pregnant for the first time, do you want to be pregnant at that time?' All those who answered 'no' were considered to have had an unplanned first pregnancy.

For the purposes of the study, there were two types of explanatory variables studied: (1) socioeconomic characteristics: age group, educational level, socialisation area

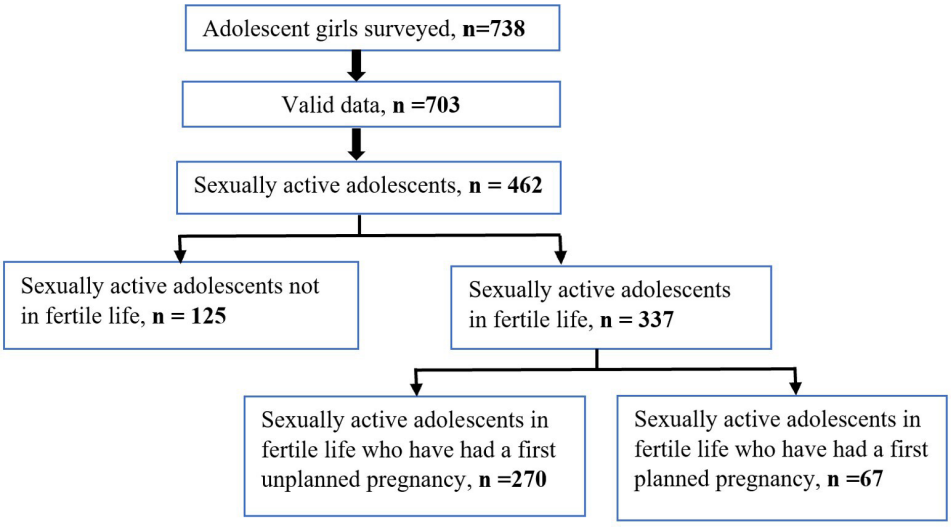

Figure 1 Data flow diagram from initial sample size to data analysis sample size.

and meeting financial needs; and (2) behavioural characteristics: frequency of exposure to information, education and communication on sexual and reproductive health (IEC/SRH) and age at first sexual intercourse. Age variables at the time of the survey and age at first sexual intercourse were grouped into age classes to facilitate analysis in the light of literature considerations.

Analysis methods

The study used two-level analysis: descriptive analysis and explanatory analysis. The first described the socioeconomic and behavioural profiles of the study population. Pearson's χ^2 test of association was used to study the associations between the dependent and independent variables. The significance level was set at 5%.

Binary logistic regression was used to identify the explanatory factors for unplanned first pregnancies. If Π is the probability of having an unplanned first pregnancy, the dependent variable of the study takes the form log (Π/1–Π) and the analysis model is as follows:

$$\text{Log}(\Pi/1-\Pi) = \beta_0 + \sum \beta k\, Xx$$

where (Π/1–Π) is the probability of a teenager having an unplanned first pregnancy; log (Π/1–Π) is the logarithm of the odds of having an unplanned first pregnancy; β_0 is the model constant; and X_x is the set of explanatory factors from X_1 to X_n as presented above.

Statistical analyses were performed using SPSS V.24 software.

Table 1 Socioeconomic and behavioural characteristics of adolescent girls (N=337)

Variables	%	n
Sociodemographic and economic factors		
Age group (years)		
15–17	42.7	144
18–19	57.3	193
Educational level		
Never attended school	22.8	77
Primary	23.7	80
Secondary level 1	38.9	131
Secondary level 2 or higher	14.5	49
Socialisation area		
Large cities	18.1	61
Medium-sized cities	21.4	72
Countryside	60.5	204
Financial needs met		
No	56.7	191
Yes	43.3	146
Behavioural factors		
Exposure to IEC/SRH		
Never	49.3	166
Sometimes	37.7	127
Often	13.1	44
Age (years) at first sexual intercourse		
<15	24.9	84
15–17	66.8	225
18–19	8.3	28

IEC/SRH, information, education and communication on sexual and reproductive health.

RESULTS

Sample and participants' description

Data were collected from 738 adolescent girls aged 15–19 years. The flow chart in figure 1 shows the screening process that led to the selection of 337 sexually active adolescent girls who were in their fertile life at the time of the survey, which were the subjects of this study. Of these girls, those who had begun their fertile life (ie, those who had either at least one child at the time of the survey or were pregnant for the first time) were eligible, the goal of this research is to identifie factors that explain unplanned first pregnancies.

Socioeconomic and behavioural characteristics of adolescent girls

Out of 10 adolescent girls, 6 (57.3%) were aged between 18 and 19 years and 4 (38.9%) had reached the first level of secondary school. With regard to socioeconomic factors, 60.5% of adolescent girls had spent the first 12 years of their lives in rural areas, and 56.7% had financial needs that were not fully met. As for behaviours related to SRH, half (50.7%) of the respondents were often exposed to IEC/SRH. With regard to age at first intercourse, 66.8% of the adolescent girls were sexually active before the age of 18 years (ie, between 15 and 17), while a quarter (24.9%) were sexually active before their 15th birthday (table 1).

Prevalence and frequency of unplanned first pregnancies

The prevalence of unplanned first pregnancies was 80.1% (n=270) among teenagers who had begun their reproductive lives at the time of the survey. This prevalence varies according to socioeconomic and behavioural characteristics. The frequency of unplanned first pregnancies (table 2) was higher among adolescent girls who had reached secondary education level 2 or higher (85.7%, p=0.027), among those who had spent their socialisation period in big cities (88.5%, p=0.018) and those whose financial needs were not fully met (84.8%, p=0.014).

Explanatory factors for unplanned first pregnancies

Table 3 presents the results of the three regression models according to factors in the group: the first model with sociodemographic and economic factors, the second with behavioural factors and the third taking into account both groups of factors. Among two individual

Table 2 Frequency of unplanned first pregnancies by socioeconomic and behavioural characteristics of adolescent girls

Variables	% (n)	95% CI	P value
Sociodemographic and economic factors			
Age group (years)			0.078
15–17	84.0 (144)	77.3 to 90.5	
18–19	77.2 (149)	70.5 to 83.9	
Educational level			0.027
Never attended school	72.7 (77)	61.0 to 84.4	
Primary	77.5 (80)	66.7 to 88.4	
Secondary level 1	84.0 (131)	77.2 to 90.6	
Secondary level 2 or higher	85.7 (49)	75.1 to 96.3	
Socialisation area			0.018
Large cities	88.5 (61)	79.9 to 97.0	
Medium-sized cities	84.7 (72)	75.7 to 93.7	
Countryside	76.0 (204)	69.3 to 82.7	
Financial needs met			0.014
No	84.8 (191)	79.4 to 90.3	
Yes	74.0 (146)	65.7 to 82.3	
Behavioural factors			
Exposure to IEC/SRH			0.994
Never	80.1 (166)	73.3 to 86.9	
Sometimes	80.3 (127)	72.6 to 88.0	
Often	79.5 (44)	66.1 to 92.9	
Age (years) at first sexual intercourse			0.183
<15	78.6 (84)	68.7 to 88.5	
15–17	82.2 (225)	76.7 to 87.7	
18–19	67.9 (28)	46.9 to 88.9	
Total	80.1 (270)	75.3 to 84.9	

"n" represents the total number of adolescent girls at risk by category as described in table 1.
IEC/SRH, Information, Education and Communication on Sexual and Reproductive Health.

models, only the model with sociodemographic and economic factors showed a significant effect on the occurrence of an unplanned first pregnancy. Specifically, adolescent girls whose financial needs were not met were 1.8 times (p=0.027) more likely to have an unplanned first pregnancy compared with others. The same trend was observed in the final model (OR=1.7, p=0.041).

DISCUSSION

In this study, the prevalence of unplanned first pregnancies among adolescent girls was estimated at 80.1%. A comparison of this prevalence with other studies showed that it is higher than those found elsewhere in the African subregion. In Cameroon, a prevalence of unplanned pregnancies of 51.2% is found among adolescent and young girls aged 12–24 years.[16] In Yamoussoukro, Côte d'Ivoire, Aké-Tano *et al*[17] found a prevalence of 61.7% (CI 56.3 to 67.1) of cases of unplanned pregnancy resulting in abortion among adolescent and young girls in secondary schools. In 10 Sub-Saharan African countries with the highest adolescent fertility rates, Ahinkorah[18] estimated a prevalence of unplanned and unwanted pregnancies of 22.4% among adolescent and young girls aged 15–24 years. This prevalence varies from 10.2% in Gambia to 46.6% in Angola.

Differences in prevalence between the above-mentioned countries and Benin can be explained by several factors. First is the rank of the study event. Indeed, none of the studies previously cited specified if unplanned or unwanted pregnancies were the very first experienced by the respondants or not. However, for teenagers often confronted with early pregnancies, such precision may affect the responses and consequently the prevalence determined by various studies. The second factor is the study population. Almost all the studies presented focused on adolescents and young girls aged 15–24 years, whereas the present study focused on adolescents aged 15–19 years who have started their fertile lives. The third

Table 3 Explanatory factors for unplanned first pregnancies among adolescent girls

Variables	Model 1 OR (p value)	Model 2 OR (p value)	Model 3 OR (p value)
Sociodemographic and economic factors			
Age group (years)			
15–17	1.7 (0.063)		1.7 (0.064)
18–19	1		1
Educational level			
Never attended school	0.4 (0.131)		0.4 (0.141)
Primary	0.5 (0.177)		0.4 (0.142)
Secondary level 1	0.8 (0.780)		0.8 (0.743)
Secondary level 2 or higher	1		1
Socialisation area			
Large cities	1		1
Medium-sized cities	0.7 (0.588)		0.6 (0.468)
Countryside	0.4 (0.080)		0.4 (0.063)
Financial needs met			
No	**1.8 (0.027)**		**1.7 (0.041)**
Yes	1		1
Behavioural factors			
Exposure to IEC/SRH			
Never		1.7 (0.251)	1.3 (0.556)
Sometimes		2.2 (0.074)	1.8 (0.187)
Often		1	1
Age (years) at first sexual intercourse			
<15		1.0 (0.919)	1.2 (0.585)
15–17		1.0 (0.864)	1.2 (0.670)
18–19		1	1
−2log-likelihood	317.3	333.2	314.9
χ^2 value	18.9	0.33	21.3
χ^2 significance	0.009	0.988	0.031

Significant Odd Ratio of explanatory factor for first unplanned pregnancy in the regression model.
IEC/SRH, information, education and communication on sexual and reproductive health.

factor is the significant proportion of respondents in each study who became sexually active at an early age. The fourth factor is the sample size and study context, and the last factor is the realities of the study setting, etc. With regard to the latter parameter, the results of this study showed a higher frequency of unplanned pregnancy among adolescent girls with a secondary level of education or higher compared with those without schooling (85.7% vs 72.7%, p=0.027). In Kenya, on the other hand, more unplanned pregnancies occurred among adolescents with no schooling than those with secondary level of education or higher (53.8% vs 37.9%).[19] Low use of preventive measures against unsafe sex, peer pressure, absence or low level of knowledge about comprehensive sexual health education, etc, increase the risk of unplanned pregnancies.[20] These factors justify the fact that Beninese teenage girls in secondary schools are more concerned about unplanned pregnancies because they would have liked to pursue their studies and future career plans than be pregnant at a young age.

Previous research has highlighted the effect of several explanatory factors similar to the one found in this study, which relates to unmet financial needs. In South Africa, it was found that adolescent girls of high socioeconomic status had a lower propensity to having unplanned or unwanted pregnancies (OR=0.69, 95% CI 0.58 to 0.83 and OR=0.78, 95% CI 0.64 to 0.96; p<0.05) than those of low socioeconomic status.[21] In Rwanda, Uwizeye *et al*[22] also found that adolescent girls from wealthy quintiles were less likely to have unwanted pregnancies than those from the lowest quintile (OR=0.51, 95% CI 0.33 to 0.78; p<0.05). This is also the case with other works[18 23 24] on

adolescent and young girls, finding that the likelihood of having an unplanned pregnancy was higher in the group of adolescents with low economic standard of living. The low economic status of adolescent girls and their unmet financial needs make them more vulnerable to having early and unplanned pregnancies, limiting their access to education, information and SRH services. This also increases their economic dependence, exposing them to unprotected sex and sexual abuse.

The invalidated relationship between educational level and the occurrence of an unplanned first pregnancy in the bivariate analysis deserves attention. The result indicates that adolescent girls with secondary level of education or higher are more likely to have an unplanned first pregnancy than their counterparts who had primary education or were never been to school. A possible explanation for this is that teenagers who have higher education have greater desire to report the start of their reproductive life in order to achieve their educational (graduation) and employment goals. As a result, they might have unmet contraceptive needs that if met would have enabled them to avoid unplanned pregnancies. This trend between higher educational levels and unwanted pregnancies is supported by the classic demographic theories. They attribute the drop in the desire to have children and the decline in the age of first fertility to the increase in educational level, to girls and women professional plans and to the socioeconomic framework that characterise the social context in which they evolve.[25]

Moreover, the result related to educational level is contrary to many studies which found that adolescent girls with no schooling or primary education are more likely to have an unplanned first pregnancy compared with those with secondary or higher education.[22 24 26–28] Explanations include the fact that those with secondary education are more likely to have knowledge of the means and services available to prevent unsafe sex and unplanned pregnancies. They are also better equipped to inform themselves independently about SRH. However, it should be pointed out that there are also several contextual factors that do not encourage systematic use of SRH services in cases where adolescent girls are aware of the existence of such services. These include factors such as rumours, prejudice, misperceptions about modern contraceptive methods and condoms, inadequate and/or poor knowledge of the consequences of unsafe sex, etc.[29–34] Absence of parent–child dialogues on SRH, low coverage of this subject in schools and extracurricular programmes, etc, are also aspects to be considered when assessing trends.

Limitations

Although the results obtained in this study are very interesting in relation to the study's objective, they may be affected by certain biases due to the subject's sensitivity. Respondents may have provided biased answers to very sensitive and/or intimate questions, such as on sexuality, unwanted first pregnancies, whether or not they were terminated, etc., particularly, when they take into account some social and religious considerations. However, measures were taken to reduce these biases, such as (1) conducting the interviews outside the family setting, away from the sight of their parents, extended family members, teachers and workshop bosses, whose presence in the area where the interviews took place could disturb the participants and make them provide false answers and declarations; and (2) creating a team of collectors in pairs, that is, a woman and a man, to facilitate communication, put at ease and confidence those eligible interviewed by the interviewer of their preference.

In methodological terms, the main potential bias was that of selection. By concentrating the data collection on households, adolescent girls, most of whom were outside their households attending schools, learning a trade, etc, might have reduced their chance of being involved in the survey. To this end, the spatiotemporal universe of statistical units was considered for sampling. These include schools, places of work and learning, public and private healthcare institutions, and places in the neighbourhoods and villages where adolescent and young girls gather (youth centres, public squares, etc).

CONCLUSION

The results of this research show a prevalence of unplanned first pregnancies of 80.1% among adolescents. Adolescent girls with unmet financial needs as well as those with secondary education or higher are more likely to have unplanned first pregnancies. This last observation is easily explained in a context where academic and professional carreers take priority.

In order to achieve the SDGs related to AYRH in Benin, specific multisectoral interventions that effectively and sustainably contribute to reducing unplanned pregnancies are needed. Specifically, these interventions should aim to strengthen adolescents' and young girls' level of SRH understanding, improve access to modern contraceptive methods to those who want them, promote access to employment, promote girl empowerment, and improve economic setting and consequently households' socioeconomic conditions.

Contributors MMM-M: main author; responsible for study design, data collection and management, statistical analysis and initial manuscript drafting; also responsible for the overall content as the guarantor. EA: participated in data collection and drafting of the study context. VTD: study and validation of data collection tools and protocol. CA: responsible for scientific orientation of the various stages of the design, protocol review and drafting of the first versions of the manuscript. MAS: as scientific director, coordinated the research authorisation process through validation by the LaReSPD scientific committee.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants. Prior to implementing the survey, the data of which were used in the manuscript, the protocol and collection tools were studied and approved by the scientific committee of the Laboratoire de Recherche en Sciences de la Population et du Développement (LaReSPD) of Parakou University. This approval was sanctioned by research authorisation n°06 on 17 May 2019, granted by the director of LaReSPD. Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

ORCID iD

Mahouli Mireille-Marie Mintogbe http://orcid.org/0000-0001-8511-4311

REFERENCES

1 Mushwana C, Nkoane N, Habedi D. Views of teenagers towards teenage pregnancy in the Capricorn district, Limpopo Province. *Afr J Reprod Health* 2023;27:46–56.
2 Jean Simon D, Kiragu A, Toudeka AS, *et al*. Être mère à l'adolescence à Haïti: un phénomène persistant et multifactoriel. *Sexol* 2021;30:267–76.
3 Dangbemey DP, Hounkpatin B, Aboubakar M, *et al*. Pratiques sexuelles des adolescentes et jeunes des collèges d'enseignement de Cotonou en République du Bénin. *Sexol* 2020;29:41–5.
4 Tessema GA, Laurence CO, Melaku YA, *et al*. Trends and causes of maternal mortality in Ethiopia during 1990-2013: findings from the Global Burden of Diseases study 2013. *BMC Public Health* 2017;17:160.
5 Gebremedhin S, Asefa A. Treatment-seeking for vaginal fistula in sub-Saharan Africa. *PLoS ONE* 2019;14:e0216763.
6 Mongbo V, Godin I, Mahieu C, *et al*. La césarienne dans le contexte de gratuité au Bénin. *Santé Publique* 2016;28:399–407.
7 United Nations. Rapport de la conférence internationale sur la population et le développement, [a/conf.171/13/rev.1v]. 1995.200.
8 Ministère de la Santé-DSME du Bénin. Stratégie nationale multisectorielle de santé sexuelle et de la reproduction des adolescents et jeunes au bénin: 2010-2020. Ministère de la Santé du Bénin; 2010.48.
9 Ministère de la Santé-DSME du Bénin. Plan stratégique intégré santé de reproduction, de la mère, du nouveau- né, de l'enfant, de l'adolescent et du jeune (srmneaj) pour la période 2017-2021. Direction de Santé de la Mère et de l'Enfant; 2017.94.
10 UNFPA-Bénin, & FONDS FRANCAIS MUSKOKA. Documentation du processus de mise en œuvre de l'éducation à la santé sexuelle. 2019.76.
11 INSAE. Enquête démographique et de santé au bénin (edsb-v) 2017-2018. 2019.675.
12 Ministère de la Santé-Bénin. Enquête de surveillance de deuxième génération (esdg) sur les ist, le vih et le sida auprès des adolescents-jeunes, camionneurs, personnes privées de liberté, travailleuses de sexe et clients, serveuses des bars et restaurants en 2021 au bénin, [rapport d'étude]. Programme Santé de la Lutte contre le Sida; 2022.311.
13 Tonato Bagnan JA, Ogoudjobi OM, Lokossou MSHS, *et al*. Contraception among Medical and Paramedical Students in Cotonou, Benin in 2016: Knowledge and Practices. *Clinics Mother Child Health* 2017;14:1–4.
14 Baxerres C, Boko I, Konkobo A, *et al*. Gestion des grossesses non désirées au Bénin et au Burkina Faso: Situations affectives et pratiques populaires d'avortement. *Anthropol et Santé* 2018;1–16.
15 Heidari S, Babor TF, De Castro P, *et al*. Sex and Gender Equity in Research: rationale for the SAGER guidelines and recommended use. *Res Integr Peer Rev* 2016;1:2.
16 De-Banguirys LS, Dansou J, Beninguissé G. Analyse des facteurs de non recours en première consultation prénatale lors des premières grossesses des adolescentes et jeunes à yaoundé, cameroun. 2013.
17 Aké-Tano SOP, Kpebo DO, Konan YE, *et al*. Pratiques d'avortement chez des lycéennes à Yamoussoukro, Côte d'Ivoire. *Santé Publique* 2017;Vol. 29:711–7.
18 Ahinkorah BO. Individual and contextual factors associated with mistimed and unwanted pregnancies among adolescent girls and young women in selected high fertility countries in sub-Saharan Africa: A multilevel mixed effects analysis. *PLoS One* 2020;15:e0241050.
19 Ajayi AI, Odunga SA, Oduor C, *et al*. "I was tricked": understanding reasons for unintended pregnancy among sexually active adolescent girls. *Reprod Health* 2021;18:19.
20 Cowgill KD, Bishop J, Norgaard AK, *et al*. Obstetric fistula in low-resource countries: an under-valued and under-studied problem--systematic review of its incidence, prevalence, and association with stillbirth. *BMC Pregnancy Childbirth* 2015;15:193.
21 Christofides NJ, Jewkes RK, Dunkle KL, *et al*. Risk factors for unplanned and unwanted teenage pregnancies occurring over two years of follow-up among a cohort of young South African women. *Glob Health Action* 2014;7:1–9.
22 Uwizeye D, Muhayiteto R, Kantarama E, *et al*. Prevalence of teenage pregnancy and the associated contextual correlates in Rwanda. *Heliyon* 2020;6:e05037.
23 Bain LE, Zweekhorst MBM, de Cock Buning T. Prevalence and Determinants of Unintended Pregnancy in Sub -Saharan Africa: A Systematic Review. *Afr J Reprod Health* 2020;24:187–205.
24 Gwido V, Fekadu MA. Factors contributing to, and e ffects of, teenage pregnancy in Juba. *S Sudan Med J* 2016;9:28–31.
25 Kirk D. Demographic transition theory. *Popul Stud (Camb)* 1996;50:361–87.
26 Odimegwu CO. Springer; Family demography and post-2015 development agenda in Africa, 2020. Available: https://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=2240994
27 Kaphagawani NC, Kalipeni E. Sociocultural factors contributing to teenage pregnancy in Zomba district, Malawi. *Glob Public Health* 2017;12:694–710.
28 Krugu JK, Mevissen F, Münkel M, *et al*. Beyond love: a qualitative analysis of factors associated with teenage pregnancy among young women with pregnancy experience in Bolgatanga, Ghana. *Cult Health Sex* 2017;19:293–307.
29 Samaké A, Diarra L, Traoré SO, *et al*. L'Accouchement chez les Adolescentes au Centre de Sante de Référence de la Commune VI de District de Bamako. *J Med Biomed Sci* 2022;35:11–4.
30 Lizeth R, Ibom SC. Teenage pregnancy prevention: The church, community, culture and contraceptives. *Afr J Reprod Health* 2021;26:51–7.
31 Come Yélian Adohinzin C, Méda N, Anicet Ouédraogo G, *et al*. Connaissances et attitudes des jeunes de Bobo-Dioulasso en matière de prévention du VIH et de la grossesse non désirée. *Santé Publique* 2016;28:525–34.
32 Jonas K, Crutzen R, van den Borne B. Teenage pregnancy rates and associations with other health risk behaviours: a three-wave cross-sectional study among South African school-going adolescents. *Reprod Health* 2016;13:50.
33 Banke-Thomas AO, Kouraogo SF, Siribie A, *et al*. Knowledge of obstetric fistula prevention amongst young women in urban and rural Burkina Faso: a cross-sectional study. *PLoS ONE* 2013;8:e85921.
34 Diaouga HS, Yacouba MC, Salifou MM, *et al*. Pronostic de la grossesse chez les mineures mariées en cours de scolarisation à Niamey, République du Niger. *Pan Afr Med J* 2020;37:37.