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Sexual and reproductive health of Sudanese refugee girls in Chad: mixed methods study with perspectives from 12–19 year old girls, parents, and health workers

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Abstract

Background In humanitarian settings, refugee girls' vulnerability to negative sexual and reproductive health (SRH) outcomes and the barriers they face to access to SRH services increase. Despite global guidelines on adolescent sexual and reproductive health and rights (SRHR) in humanitarian settings, evidence on the diverse knowledge, attitudes, and behaviors of refugee adolescents are limited.

Methods This mixed methods study used a cross-sectional survey and participatory research activities to explore the knowledge, attitudes, and behaviors of 12–19 year old refugee girls from Darfur living in two refugee camps in Wadi-Fira, Chad. Focus group discussions with parents of adolescents and in-depth interviews with health workers were conducted to better understand community attitudes toward adolescent SRHR and barriers to accessing services.

Results Overall, SRH knowledge, including of contraceptive methods, was mixed, but older girls had better knowledge than younger girls. Despite stigma around adolescent sexual activity expressed in this community, 20.9% of girls had already had sex. The majority of girls believed that health workers would maintain confidentiality if they sought contraception. Among girls who had ever had sex, 18.0% were currently using a modern contraceptive. None were using a long-acting method, but most obtained their method at the camp health center. Parents and health workers described how social stigma toward premarital sex and unintended pregnancy impeded adolescent access to SRHR information and services, although the midwives described helping girls to seek contraception.

Conclusions Despite community stigma towards premarital sex and contraception for adolescents, some girls in the camps successfully managed to receive a contraceptive method, demonstrating both their interest in and need for contraception. Although midwives were largely supportive of adolescent access, expanding contraceptive service delivery channels and making services more adolescent-responsive would further increase adolescent access. Gender transformative programming engaging girls and boys, should be expanded to improve adolescent knowledge

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and self-efficacy with respect to SRHR. These efforts must also engage parents and community members to create an enabling environment for adolescent SRHR and reduce stigma.

Keywords Sexual and reproductive health, Adolescents, Refugee, Humanitarian, Chad

Introduction

Pregnancy complications—including eclampsia, infections, and unsafe abortions—are the leading causes of death for adolescent girls aged 15–19 in low income countries [1]. Despite increasing global attention to the need for comprehensive, adolescent-responsive sexual and reproductive health (SRH) services, SRH needs among adolescent girls living in low- or middle-income countries (LMICs) remain largely unmet globally. Although global contraceptive use among adolescents aged 15–19 doubled from 1990–2019 [2], an estimated 32 million adolescent girls in LMICs want to avoid pregnancy, but 43% of them are not using modern contraception [3]. Approximately half of pregnancies among adolescent girls are unintended, and 57% of those pregnancies end in abortion [3]. Adolescent maternal deaths in LMICs would drop by an estimated 63% if adolescents' contraceptive needs were fully met and all pregnant adolescents received the recommended standards of care [3].

Girls face many barriers to accessing SRH services, including stigmatizing community attitudes and norms regarding premarital sex and pregnancy among unmarried girls [4]. These attitudes strongly influence if and when girls learn about sexual and reproductive health and rights (SRHR) topics, which may have a cascading effect on girls' knowledge and their own attitudes toward SRH. Many parents report that unwanted pregnancies and abortions among their adolescent girls bring shame upon their families, contributing to social stigma surrounding girls' access to SRH services [5]. Health provider attitudes and behaviors also contribute to this culture of stigma, which may be partially propelled by their own biases and fears of parental reprisal. As a result, adolescents in many settings report feeling judged or treated disrespectfully when seeking SRH services [4, 6].

Although data on the SRHR of adolescents living in humanitarian settings are limited, experts agree that both girls' vulnerability to negative SRH outcomes and barriers to SRH services increase in these environments [4, 7]. Humanitarian crises often disrupt adolescent girls' support systems and social networks, forcing them to take on additional responsibilities and exposing them to sexual coercion, violence and exploitation; unintended pregnancy; unsafe abortions and other negative coping mechanisms which can have lifelong impacts on their health [8]. In addition, multi-layered barriers such as collapsing health systems, lack of appropriate services or low-quality services, increased insecurity, and other structural barriers make accessing services and information difficult even if they are available [9].

Global standards and best practices for providing adolescent-responsive SRH services in humanitarian settings are available—mainly the *Adolescent Sexual and Reproductive Health Toolkit for Humanitarian Settings* and the *Inter-Agency Field Manual on Reproductive Health in Humanitarian Settings* [9, 10]. While these tools provide substantial guidance, evidence on the diverse and nuanced knowledge, attitudes, and behaviors of crisis-affected adolescents and the effectiveness of interventions is lacking [4, 11, 12]. Without this insight into adolescents' SRHR experiences, humanitarian actors will continue to fall short of their obligation to provide adolescent-responsive SRH services. Therefore, it is critical to disseminate learning on adolescent SRHR from humanitarian settings, like eastern Chad.

Context

Chad hosted approximately 400,000 refugees who fled Sudan beginning in 2003 when violence erupted in Darfur, most of whom reside in refugee camps along the country's eastern border [13]. The humanitarian needs in these camps have increased considerably since the resurgence of violence in Sudan in April 2023, which prompted the arrival of an additional 400,000 new refugees through September 2023 [14]. This research was conducted prior to the 2023 influx of refugees, when an estimated 52,135 refugees resided in Mile and Kounoungou refugee camps in Wadi Fira province [13].

Little data on adolescent refugees in Chad are available and key SRHR indicators for adolescents in Chad in the 2019 Multiple Indicator Cluster Survey (MICS) are poor. For example, among women aged 20–24 living in Wadi Fira, 15.2% were married before the age of 15 and 42.6% were married before the age of 18 [15]. Among sexually active 15–24 year old girls in Wadi Fira, 48.3% reported that their sexual partner was 10 or more years older than them [15]. Modern contraceptive use remains low: 3.6% among partnered 15–19 year old girls in Chad [15]. Comparatively, in Wadi Fira, 1.3% of partnered women aged 15–49 were using a modern contraceptive method, suggesting that modern contraceptive use would be even lower among adolescents and unpartnered girls.

In 2021–2024, International Rescue Committee (IRC), the Ministry of Health, and the Association Tchadienne

pour le Bien-Etre Familial (ASTBEF) implemented the Protection, Gender and Health (ProGeSan) program in two provinces in Chad, including in Mile and Kounoungou refugee camps. ProGeSan enhances the social empowerment of women through improved access to maternal, newborn, infant, adolescent, and SRH services and gender-based violence support services. IRC-supported health centers in the camps provide a range of short-acting and long-acting reversible contraceptive (LARC) methods as well as antenatal, postnatal and delivery care. Trained youth peer educators (school-based) and youth facilitators (out of school) provide SRHR education and information to adolescents in the camps. IRC also implements the Girl Shine program, designed for adolescents in humanitarian settings, in which a local mentor facilitates support and empowerment activities with a cohort of girls [16]. In 2022, IRC, the University of N'Djaména, and the RAISE Initiative at Columbia University Mailman School of Public Health conducted a mixed methods study in Mile and Kounoungou refugee camps to explore adolescent refugees' SRHR knowledge, attitudes, and behaviors and identify barriers to SRH service utilization. This manuscript presents findings from adolescent girls as well as parents of adolescents and health workers providing SRH services in the two camps; adolescent boys' data are published elsewhere [17].

Methodology

This study used a cross-sectional representative survey of adolescents, participatory research activities with adolescents, focus group discussions with parents of adolescents, and in-depth interviews with health workers in the maternities of the health centers in Mile and Kounoungou camps.

Survey

We conducted a representative quantitative survey of adolescent girls aged 12–19 years living in the two refugee camps. A list of adolescents stratified by age group (12–14 years, 15–17 years, 18–19 years) was extracted from household lists maintained by UNHCR. For each camp, 150 girls per age group were randomly selected. Refugee community health workers (CHWs) and youth group representatives in the two camps indicated selected adolescents who were known to be living outside of the camp and therefore unable to participate. An additional 60–70 girls per age group per camp were subsequently randomly selected to ensure achievement of the desired sample size of 100 girls per age group per camp.

The questionnaire was developed in French and adapted from existing tools including *Demographic and Health Surveys, Gender and Adolescence: Global Evidence (GAGE), World Health Organization* and those previously used by RAISE and IRC. Topics included SRHR knowledge and attitudes, marriage, sexual activity, contraceptive use, pregnancy, safety and violence. The French questionnaire was uploaded to tablets via KoboToolbox. Female Arabic-speaking interviewers from the host community participated in an eight-day training that covered SRH terminology, values clarification and survey techniques, including practical exercises. During the training, the interviewers discussed and agreed on how to translate questions into local Arabic, and conducted practice interviews. The CHWs or youth group representatives accompanied the survey teams to locate selected adolescents. Efforts were made to return another day to complete interviews with adolescents who were temporarily absent. Data collection took place 5–20 July 2022.

Qualitative methods

Participatory research activities were conducted with two groups of adolescent girls in each camp, stratified by age group (12–14 years and 15–18 years). The CHWs and youth representatives recruited participants meeting the age criteria, with at least one from each zone in the camps. A day-long session with each group was organized with the following activities: discussing and defining key SRH terminology, creating timelines with key events in the sexual, reproductive, and social development of an adolescent girl in the camp, identifying and prioritizing adolescents' SRH needs and discussing barriers and facilitators to their access to SRH services. Adolescents first worked on each activity in smaller groups, and then came together for larger group discussion. The sessions were guided by trained facilitators in Arabic and supported by translators for French-speaking members of the research team who observed.

Four focus group discussions (FGD) were organized with parents of adolescents: one with mothers and one with fathers in each camp. The CHWs recruited participants from various zones throughout the camp. Although the adolescents of some parents may have also participated in the study, this was not an eligibility criterion. The FGD guide included questions about if and how parents talk to their adolescents about SRHR topics, where they think adolescents seek information on SRHR and their opinion of the quality of those information sources, their opinions on adolescent use of SRH services and the barriers adolescents face accessing those services. The FGDs were conducted in Arabic in private rooms at the health centers by a trained female or male interviewer on 20 June 2022.

Interviews were conducted individually with Chadian midwives, and in dyads with Sudanese traditional birth attendants (TBAs) and female CHWs working in the

health centers in the two camps. Questions about adolescent SRHR were added to the end of longer interviews about person-centered maternity care [18]. The interview guide asked about adolescents' SRH needs and care-seeking, barriers and facilitators adolescents face in accessing SRH services, their perceptions of the community views on adolescent SRHR, and what changes are needed to improve adolescent access and use of SRH services. Trained female interviewers conducted interviews at the health facilities in French with midwives and in Arabic with Sudanese providers 29 June-1 July 2022.

Analysis

Survey data were downloaded from KoboToolbox and exported to SPSS (v28) for cleaning and analysis. Data were stratified into three age groups (12–14 years, 15–17 years, 18–19 years) or two age groups for some data (12–17 years and 18–19 years). Chi-square tests were used for categorical variables to describe and compare results among age groups. Observations with missing data for specific variables were excluded from analysis of those variables (≤ 5% for all variables).

FGDs and in-depth interviews were audio-recorded with participant consent, then transcribed and translated, if needed, into French for analysis. Key discussions from the participatory research were also transcribed and translated. In addition, the research team members took notes and saved the posters the girls created throughout the day. The French transcripts were clarified with Chadian members of the research team. Researchers used an inductive approach to create codebooks outlining major themes found in the FGDs and interviews. Once codebooks were finalized, transcripts and codebooks were uploaded into Nvivo (v12) for coding. All transcripts were coded by two members of the research team, except for one transcript coded by a single coder at the end of the process. Coding discrepancies were discussed and resolved together. Research team members then highlighted key themes via content analysis. They also conducted a thematic synthesis of the posters and transcripts of selected discussions from the participatory activities to highlight key themes that complement the survey results.

Ethical considerations

The FGDs and interviews were held in private rooms, and any names mentioned were redacted from the transcripts. Verbal informed consent was obtained from all participants aged 15 and over; because this study met the criteria for minimal risk, parental consent for 15–17 year olds was waived. For 12–14 year old participants, verbal parental consent and then verbal adolescent assent were obtained. Names were not recorded for any participant to preserve anonymity; the lists used to locate adolescents were collected each evening and destroyed at the end of data collection. Only research team members had access to the data. Ethical approvals for all study components and consent procedures were received from the Institutional Review Board of Columbia University and the Direction de la Recherche et de l'Innovation, Direction Generale Technique de l'Enseignement Superieur, de la Recherche et de l'Innovation in Chad.

Results

The cross-sectional survey achieved a total of sample size of 664 adolescent girls aged 12–19 (Table 1). Participatory research activities were held with two groups of adolescent girls in each camp, stratified by age group (12–14 year olds and 15–19 year olds), with 12–18 participants per group. A total of four focus group discussions were held with parents of adolescents. In-depth interviews were held with five midwives,12 Sudanese refugee TBAs, and three refugee CHWs.

Survey participant characteristics

The vast majority of girls (87.5%) in the survey had lived in the camp for 10 years or more, and all were Muslim. Nearly all girls were in school at the time of the survey, but more girls aged 12–14 (97.2%) were enrolled compared to girls aged 18–19 (85.6%) (Table 2). Among girls who were not in school, the most common reasons for dropping out was their family's lack of money (63.3%) or marriage (18.3%). Considerably more girls in the older age groups reported ever having sex (16.8% for 15–17 year olds, 43.2% for 18–19 year olds) than 12–14 year old girls (3.1%). Older girls were also more likely to be married: 10% of girls aged 15–17 and 37.3%

Table 1 Total sample

Age group and sex	No. of participants, Kounoungou	No. of participants, Mile
Survey		
Girls, 12–14 years	114	110
Girls, 15–17 years	107	113
Girls, 18–19 years	109	111
Total	**330**	**334**
Focus group discussions		
Mothers of adolescents	6	12
Fathers of adolescents	10	11
Interviews		
Midwives (Chadian), individual	2	3
Traditional birth attendants (Sudanese), dyads	6	6
Community health workers (Sudanese), individual or dyad	0	3

Table 2 Participant characteristics, Girls 12–19 years old, Mile and Kounoungou camps, Chad

	Total (*N* = 664) %(*n*)	12–14 years (*N* = 224) %(*n*)	15–17 years (*N* = 220) %(*n*)	18–19 years (*N* = 220) %(*n*)	*p*-value
Currently in school	90.4% (568)	97.2% (212)	88.0% (184)	85.6% (172)	< .001
Reasons for having dropped out of school	*n* = 60	*n* = 6	*n* = 25	*n* = 29	.11
Family lacks money	63.3% (38)	100% (6)	72.0% (18)	48.3% (14)	
Got married	18.3% (11)	0	16.0% (4)	24.1% (7)	
Got pregnant	8.3% (5)	0	0	17.2% (5)	
Other reason	10.0% (6)	0	12.0% (3)	10.3% (3)	
Highest level of education completed					< .001
No formal education	5.4% (36)	2.7% (6)	5.0% (11)	8.6% (19)	
Some or completed primary school	38.3% (253)	75.6% (167)	28.6% (63)	10.5% (23)	
Some or completed secondary school or higher	56.3% (372)	21.7% (48)	66.4% (146)	80.9% (178)	
Ever had sex	20.9% (139)	3.1% (7)	16.8% (37)	43.2% (95)	< .001
Currently married	15.7% (104)	0	10.0% (22)	37.3% (82)	< .001

of girls aged 18–19 compared to none of the 12–14 year olds. During the participatory research activities, most girls described marriage before age 18 as 'forced' and a negative event in a girl's life, while marriage at 18 years or later was identified as a positive event.

All four groups of adolescent girls in the participatory research identified education as one of their top three priorities. Many girls across age groups emphasized that getting married and/or pregnant interrupted girls' education, saying that either husbands or parents forced them to leave school upon marriage or childcare made school impossible for them.

> *"Girls are usually given in marriage, and more often than not it's their husbands who forbid them from continuing their studies." (15-19 year old girl)*
> *"Between 15 and 20 years old, if the girl…gets pregnant and she gives birth, she won't be able to take care of this child and because of this child she abandons everything." (12-14 year old girl)*

Girls said that parents usually made the decision about marriage, sometimes without involving the girl – especially for early or forced marriages. They described varying motivations of parents, including the ability of the potential husband to provide a good life for the girl, or to prevent a girl from getting pregnant before marriage.

> *"Because some girls get out of line [have sex outside of marriage], that's why [parents] force them into marriage." (12-14 year old girl)*
> *"Some people want to give their daughters to men who have more money and own a lot of property. They don't take their daughter's feelings into account. If you want someone, you love him with all your heart and not because of what he owns, but parents prefer money and don't take their daughter's feelings into account." (15-19 year old girl)*

SRHR knowledge

Overall SRHR knowledge was better among older girls (Table 3). Although most girls correctly responded that menarche means that a girl can get pregnant, and that a girl could get pregnant the first time she has sex, more older girls than younger girls gave the correct answers. More than 10% of 12–14 year olds said they didn't know the answers to these questions compared to less than 2% of 18–19 year olds. Prompted knowledge of contraceptive methods was also better among older girls with 65.0% of 18–19 year olds, 56.8% of 15–17 year olds, and 29.0% of 12–14 year olds able to identify three or more modern methods. However, 23.2% of 15–17 year olds and 34.4% of 12–14 year olds were unable to identify any modern contraceptive method, even with prompting. Injectables and pills were the best known methods in all age groups. Less than half of 18–19 year olds knew of LARCs, implants (45.9%) and intra-uterine devices (IUDs) (33.6%), and even fewer younger girls had this knowledge.

SRHR communication and trust

Overall, the majority of girls (83.6%) reported being comfortable discussing schooling with their parents (Table 4). However, some topics, like menstruation and marriage, were easier to talk about than others, like romantic relationships and how to avoid pregnancy. Younger girls were less comfortable talking about most topics compared to older girls. For example, 41.7% of girls aged 12–14 were comfortable talking about menstruation compared to 65.5% of girls aged 18–19. Only

Table 3 SRHR knowledge, Girls 12–19 years old, Mile and Kounoungou camps, Chad

	Total (*N* = 664) %(*n*)	**12–14 years (*N* = 224) %(*n*)**	**15–17 years (*N* = 220) %(*n*)**	**18–19 years (*N* = 220) %(*n*)**	***p*-value**
The beginning of menstruation means that girls have the ability to become pregnant					< .001
True[a]	60.2% (400)	53.6% (120)	60.9% (134)	66.4% (146)	
False	32.7% (217)	34.8% (78)	30.9% (68)	32.3% (71)	
Don't know	7.1% (47)	11.6% (26)	8.2% (18)	1.4% (3)	
A girl can get pregnant the first time she has sex					< .001
True[a]	59.8% (397)	54.9% (123)	60.0% (132)	64.5% (142)	
False	32.7% (217)	31.7% (71)	31.4% (69)	35.0% (77)	
Don't know	7.5% (50)	13.4% (30)	8.6% (19)	0.5% (1)	
Number of modern contraceptive methods known (*prompted*)					< .001
None	25.3% (168)	34.4% (77)	23.2% (51)	18.2% (40)	
1–2 methods	24.5% (161)	36.6% (82)	20.0% (44)	16.8% (37)	
3–9 methods	50.2% (333)	29.0% (65)	56.8% (125)	65.0% (143)	
Knowledge of modern contraceptive methods (*prompted)*					
Tubal ligation	18.1% (120)	12.1% (27)	14.1% (31)	28.2% (62)	< .001
Vasectomy	14.6% (97)	7.6% (17)	12.3% (27)	24.1% (53)	< .001
IUD	22.3% (148)	11.6% (26)	21.8% (48)	33.6% (74)	< .001
Implants	29.1% (193)	12.1% (27)	29.5% (65)	45.9% (101)	< .001
Injectables	55.1% (366)	43.8% (98)	62.3% (137)	59.5% (131)	< .001
Oral contraceptive pills	66.6% (442)	55.8% (125)	67.7% (149)	76.4% (168)	< .001
Condoms	33.4% (222)	21.9% (49)	36.4% (80)	42.3% (93)	< .001
Emergency contraception	25.9% (172)	17.0% (38)	25.5% (56)	35.5% (78)	< .001

[a] Indicates the correct answer

Table 4 SRHR communication and trust, Girls 12–19 years old, Mile and Kounoungou camps, Chad

	Total (*N* = 664) %(*n*)	**12–14 years (*N* = 224) %(*n*)**	**15–17 years (*N* = 220) %(*n*)**	**18–19 years (*N* = 220) %(*n*)**	***p*-value**
Comfortable talking to their parents about…					
Their studies	83.6% (554)	83.9% (188)	84.1% (185)	82.6% (181)	.91
Menstruation	54.1% (359)	41.7% (93)	55.5% (122)	65.5% (144)	< .001
Marriage	37.9% (251)	23.2% (52)	37.3% (82)	53.4% (117)	< .001
Romantic relationships	28.1% (186)	16.6% (37)	25.5% (56)	42.3% (93)	< .001
How to avoid getting pregnant	24.5% (163)	11.6% (26)	22.7% (50)	39.5% (87)	< .001
Trust in the confidentiality of contraceptive services at the health center. The health worker would…					< .001
Keep it a secret	62.1% (412)	52.9% (118)	63.6% (140)	70.0% (154)	
Tell her parents	32.3% (214)	39.0% (87)	29.1% (64)	28.6% (63)	
Don't know	5.6% (37)	8.1% (18)	7.3% (16)	1.4% (3)	

11.6% of 12–14 year olds reported being comfortable talking with their parents about pregnancy prevention compared to 39.5% of 18–19 year olds. Despite this discomfort, the majority of girls across age groups believed a health worker would keep their visit to obtain contraception a secret, with that confidence increasing with age. However, a substantial minority were still concerned that the health worker would inform their parents. In the qualitative discussions, this fear appeared to concern the refugee TBAs more than the midwives.

Although many girls expressed discomfort in discussing SRHR with their parents, mothers of adolescents in

the FGDs explained that pregnancy and menstruation were important topics to discuss with adolescent girls. The mothers reported that home and school were good quality sources of information for adolescents about SRHR. Mothers described having these conversations with their daughters while cooking dinner, fetching water, or eating together. Fathers described less engagement in these topics and generally espoused abstinence to their children.

The mothers did not agree on an ideal age at which to begin having these conversations with their daughters but suggested starting between 10 and 15 years. Some mothers said earlier is better, because girls marry young and then mothers don't have the opportunity to advise them. Other mothers said that because contraception was only for married girls, they should not discuss it with their unmarried daughters. Several women asserted that despite parental hesitation or shame, these conversations must occur.

> *"Yes, a girl of 12 years who reaches puberty… we can advise them. Even if the girl has not reached puberty, at school the teachers can advise her. But at home, you can explain to her, if you have your period, you don't have to be afraid, you can tell me and I will guide you on how to keep clean. …If you sleep with a man, you will get pregnant. You must explain this to your daughter. You should not be ashamed, as a mother or father you should advise your teens." (Mother of an adolescent).*

Sexual activity

Given the low numbers of young girls who reported ever having sex, the 12–17 year olds were merged into one group for the remaining analyses. Among 12–17 year olds, 40% had their first sexual experience between ages 10 and 14 compared to 9.7% of girls in the 18–19 age group (Table 5). All groups in the participatory research put a girl's first sexual experience before age 17 on the timelines, and before marriage. Considerably more 12–17 year olds reported that their first sexual partner was a boyfriend (56.5%) compared to 18–19 year olds (17.2%), for whom 78.5% reported a husband as their first sexual partner. Similarly, more girls aged 12–17 (39.1%) reported that their first sexual partner was within two years of their own age compared to girls aged 18–19 (18.3%). More 18–19 year olds (30.9%) than 12–17 year olds (19.0%) reported being confident they could refuse sex in three situations: with someone she loved, who paid her school fees, or who had power over her, compared to 30.9% of 18–19 year olds.

Contraceptive use, pregnancy and abortion

Among girls who ever had sex, 22.3% reported having ever used, and 18.0% reported currently using, a modern contraceptive method (Table 6). Girls aged 12–17 were more likely to report current contraceptive use (28.3%) compared to girls aged 18–19 (12.9%), although the overall numbers are low. Just over half (56%) of the current users were unmarried. Most of the 25 girls who reported current contraceptive use were using injectables while a few used pills. None of the girls reported using LARC.

Table 5 Sexual activity, Girls 12–19 years old who have ever had sex, Mile and Kounoungou camps, Chad

	Total (*N* = 139) %(n)	12–17 years old (*N* = 44) %(*n*)	18–19 years old (*N* = 95) %(*n*)	*P*-value
Mean age at first sex (SD)	15.9 (1.8)	14.6 (1.4)	16.6 (1.7)	< .001
10–14 years	19.6% (27)	40.0% (18)	9.7% (9)	< .001
15–17 years	57.2% (55)	60.0% (27)	55.9% (52)	
18–19 years	23.2% (56)	0	34.4% (32)	
Relationship with the person with whom they had first sex				< .001
Husband	64.7% (90)	37.0% (17)	78.5% (73)	
Boyfriend	30.2% (42)	56.5% (26)	17.2% (16)	
Other person	5.0% (7)	6.5% (3)	4.3% (4)	
Age of first sexual partner				.04
Same age or 1–2 years older	25.2% (35)	39.1% (18)	18.3% (17)	
3–4 years older	39.6% (55)	30.4% (14)	44.1% (41)	
5 years or more older	32.4% (45)	26.1% (12)	35.5% (33)	
Don't know	2.9% (4)	4.3% (2)	2.2% (2)	
Sexual refusal self-efficacy[a]	23.0% (152)	19.0% (84)	30.9% (68)	< .001

[a] Sexual refusal self-efficacy: Respondent is confident or very confident she can refuse sex in 3 situations with someone: she loves, who pays her school fees or who has power over her (e.g., a teacher, employer, etc.)

Table 6 Contraceptive use and pregnancy, Girls 12–19 years old who have ever had sex, Mile and Kounoungou camps, Chad

	Total (*N* = 139) %(*n*)	**12–17 years (*N* = 44) %(*n*)**	**18–19 years (*N* = 95) %(*n*)**	***p*-value**
Ever used a contraceptive method	22.3% (31)	32.6% (15)	17.2% (16)	.07
Currently using a modern contraceptive method	18.0% (25)	28.3% (13)	12.9% (12)	.05
Method currently used	*n* = 25			
Injectable	88.0% (22)			
Pill/Oral contraceptive	12.0% (3)			
Where she first obtained her method	*n* = 25			
Health center in the camp	70.8% (17)			
Pharmacy/drug seller	29.2% (7)			
A sexual partner has ever refused to use a method or tried to prevent her from using a method	20.9% (29)	19.6% (9)	21.5% (20)	.45
Used a condom the last time they had sex	15.8% (22)	23.9% (11)	11.8% (11)	.11
Reasons for not using contraception	*n* = 114			
Sexual intercourse infrequent (e.g., no partner, partner absent)	30.7% (35)	36.4% (12)	28.4% (23)	
"It's up to God"	29.8% (34)	27.3% (9)	30.9% (25)	
Desire to get pregnant or currently pregnant	24.6% (28)	30.3% (10)	22.2% (18)	
Opposition from partner, religion	15.8% (18)	12.1% (4)	17.3% (14)	
Post-partum amenorrheic, breastfeeding	13.2% (15)	9.1% (3)	14.8% (12)	
Other reason	10.5% (12)	12.1% (4)	9.9% (8)	
Ever been pregnant	30.9% (43)	17.4% (8)	37.6% (35)	.02
Currently pregnant	8.6% (12)	6.5% (3)	9.7% (9)	.53

Most users (70.8%) obtained their method at the health center, with no difference by marital status. The majority (70.8%) of contraceptive users reported that their partner knew they were using contraception. However, 20.9% of girls also reported that a sexual partner had ever refused or tried to prevent them from using contraception, with no difference between married and unmarried girls. Overall, condom use at last sex was low, reported by only 15.8% of girls. Although half of those who used a condom at last sex were married, a larger proportion of unmarried girls (27.5%) than married (11.1%) reported this ($p = 0.03$).

The majority of sexually active girls, however, were not using contraception (82.0%). The most commonly reported reasons related infrequent sex, including not being married or partner absent (30.7%), or that "it is up to God to decide" when they get pregnant (29.8%). About a quarter of girls reported a desire to become pregnant (or were currently pregnant), and 15.8% reported opposition to use, the majority of which was opposition by a husband or partner. Older girls (37.6%) were more likely than younger girls (17.4%) to have ever been pregnant. No unmarried girls reported ever being pregnant.

In the participatory research, three of four groups added a premarital unwanted pregnancy and an abortion using "pills". Several groups also mentioned that once a girl hits puberty, she needs to protect herself from boys. The girls were clear that sexual activity should be kept secret from their parents. In some cases, they said the girl would seek out the injectable contraceptive to protect herself. Some in the younger groups didn't think the midwives would give contraceptives to unmarried girls.

> *"From the age of 15, she uses contraceptive injections... Having sex outside the sacred bonds of marriage, she fears her mother will find out the consequences of her actions; she loves her mother but also feared her." (15-19 year old girl)*

Girls also said that a girl who got pregnant would keep it a secret from her parents, and in most cases, seek an abortion to avoid stigma. Some mentioned seeking an abortion with the boy who got her pregnant, while others said she would talk to her girlfriends.

> *"If the pregnancy is not from your husband, you take abortion pills." (Girl, 12-14 years old)*

Only 13.6% in the survey, however, agreed with the statement 'If I got pregnant when I did not want to be, I might try to terminate the pregnancy'. Although girls were not asked if they themselves have ever had an abortion, 38.8% of girls said they knew someone in the camp who had ended a pregnancy.

Parental attitudes toward adolescent contraceptive use

The FGDs with parents of adolescents revealed that mothers held slightly more favorable attitudes toward adolescent contraceptive use than fathers. Some fathers emphasized the importance of birth spacing for a woman's and her children's health, but others cited concerns about contraception side effects. Mothers talked more about the benefits of birth spacing for their daughters' health. One mothers group specifically referred to the unstable situation they were in and the potential need to flee again when discussing the importance of birth spacing.

"You should counsel [your daughter] that having babies without spacing them is not good…You feed [your children] well, you educate them well, but if something happens you can't [it is difficult to] flee with all those children." (Mother of adolescent)

Parents generally agreed that married adolescent girls could use contraception with their husbands' consent, emphasizing that contraceptive use was the husband's decision.

Participant 1: "Even the responsibility [for contraceptive use] is in the man's hands, the woman can't make any decisions."
Participant 2: "Since the dowry has been given, responsibility is in her husband's hands." (Mothers of adolescent)

Fathers, however, were categorically against contraceptive use for unmarried adolescents, citing religious beliefs against contraception, fears of adolescent sexual immorality, and minimal adolescent sexual activity as reasons.

"For married people, it's possible to use these pills, but for young unmarried people, whether it's a girl or a boy, we don't want them to take these pills and go around engaging in promiscuity in the community." (Father of adolescent)

Like fathers, some mothers were against contraceptive use by unmarried girls. However, the women in one FGD agreed that while they would prefer unmarried girls to abstain from sex, it was better for sexually active girls to use contraception to prevent the negative social and health consequences of an early or unintended pregnancy.

"There are girls who look for men, and without family planning, they get pregnant. So it's better to get family planning to avoid unwanted pregnancy." (Mother of adolescent)

"Women and girls die during childbirth, and this is a loss. … That's why we agree that adolescents may get family planning." (Mother of adolescent)

Some parents thought that adolescent girls would be denied contraception at the health facility without a husband's or parent's consent, while others attested that health workers would not require this consent.

Provider attitudes toward adolescent contraceptive use

The Chadian midwives, refugee TBAs, and CHWs interviewed at the camp health centers described parent and community attitudes as barriers to adolescents' access to contraception. One midwife described the community's attitude as follows:

"Because what are you, a teenager, looking for here? This is for grown-ups, the married ones. If you're married and pregnant, no problem, you can come. But if you're not married, you're not pregnant, you don't have access." (Midwife)

Contraception is provided at the maternity, where women also come for antenatal care, labor, and delivery. Nearly all health workers mentioned that girls hide or are ashamed to come to the maternity as they worry about community members waiting for other services seeing them seek services. The midwives generally referred to supporting adolescent girls to obtain services, recognizing the need to prevent unwanted pregnancies, unsafe abortions and death. Some mentioned helping girls to come secretly for services, or recommending they come at times of day when fewer people would be present.

"Because an unwanted pregnancy forces both of them [the girl and the boy] to get rid of the pregnancy. It will push them to have an unsafe abortion, and in the end the girl may even die, so this service will help them a lot." (Midwife)
"In my opinion, it [contraception] is a very good thing, because it prevents many things, such as unwanted pregnancies. But it's just that these young people don't come." (Midwife)

The CHWs said that sometimes girls came to them for contraception instead of going to the health center.

"Sometimes adolescents come to our house and explain their problem. And when we go to the health center, we explain it to the midwife, then we bring her the method, and she comes to get it from us at home, not in the health center." (CHW)

The refugee TBAs expressed more mixed attitudes toward providing contraceptives to unmarried girls. They cited incorrectly that contraception may affect

girls' fertility, in addition to describing fears of parental or community backlash and personal discomfort providing contraception to young, unmarried girls. Despite these reservations, many also recognized that contraception was needed to reduce premarital pregnancies, unsafe abortions, sexually transmitted infections, early pregnancy and subsequent complications, even death.

> *"I think it [contraception] is good for young girls because we don't want 12, 14, 16 year-olds getting pregnant. Because they'll have trouble giving birth." (Refugee TBA)*

While most health workers said community attitudes made it difficult for young people to access contraceptives, a few mentioned that community education is helping somewhat to change things while others recommended improved education for parents, religious leaders, and other influential community members.

> *"With the community here, it's a bit complicated, but in the past, they [adolescents] just didn't come at all, but after the awareness-raising – we send the CHWs up to the level of the leaders, the imams at the mosque, also, to the parents. So, with time adolescents' access has become a little easier." (Midwife)*
> *"It's always about raising community awareness. If parents know how important this is, they won't stop their children from doing it, and neither religion nor tradition will influence it. But the fact is the boys are informed but the girls are completely unaware." (Midwife)*

Discussion

Although adolescent girls in the camps faced substantial barriers to accessing SRHR information and services, some positive findings suggest an opening to improve that access. Contraceptive prevalence was relatively high in our study, with 18.0% of adolescent girls who ever had sex reporting current use of a modern method, compared to 15–19 year olds in Chad (3.6%) or Sudan (5.9%) [15, 19]. It was also higher than that found in other refugee populations [20, 21], and similar to that among conflict-affected 15–19 year olds in Democratic Republic of the Congo (DRC) [22]. However, none of the girls in this study reported using a LARC, unlike in the DRC study where half of adolescent contraceptive users used one. LARCs were also less well-known despite their availability at the health centers, suggesting a need for further education around LARCs. LARCs are highly effective and require fewer visits to the health center, which could help reduce girls' exposure to stigma while facilitating continuous contraceptive use [23, 24]. Injectables were the preferred method in this population similar to findings among adolescent refugees in Uganda [20].

Interestingly, more than half of current contraceptive users in our study were unmarried. This could be partially driven by the extensive community stigma surrounding premarital sex, a strong motivation for pregnancy prevention. It could also be related to the social pressure married girls face to become pregnant quickly after marriage or their husbands preventing them from using contraception, particularly given less supportive attitudes expressed by men [25]. Unmarried girls were no more likely than married girls to seek their method at a pharmacy, often considered to be a more anonymous place to receive contraceptives [26], in contrast to findings elsewhere [27]. This may suggest that adolescents sufficiently trust the confidentiality of services provided by midwives at the health center, as a majority reported, but it may also indicate a lack of knowledge of where else to go or lack of money to pay for a method at the pharmacy.

Participants reported substantial barriers for unmarried girls seeking contraception, including community attitudes. For example, girls may be embarrassed to be seen seeking services in the maternity by an aunt or neighbor, or fear that a provider will inform their parents of their contraceptive use, a concern expressed particularly by very young adolescents in our survey [26]. Although provider attitudes towards adolescent SRHR often reflect social norms that stigmatize premarital sexual activity, our findings suggest that the midwives demonstrated pragmatism towards adolescent contraceptive use, even if their personal preference was adolescent abstinence [28–30]. In this setting, midwives and CHWs generally supported helping the girls receive services confidentially, consistent with the survey's finding that the majority of girls believed the provider would keep their visit for contraceptives a secret, which may have contributed to the high contraceptive use found here. Attitudes among the refugee TBAs were more mixed, but like some mothers, they mentioned the severe social and health consequences of a premarital pregnancy when justifying contraceptive provision to unmarried adolescents. Further values clarification and attitude transformation (VCAT) activities would reinforce positive provider attitudes towards adolescent SRHR [31]. Simple health center-level changes, including adjusting operational hours or adding discrete areas to seek services, would also make services more responsive to girls' needs. In addition, the introduction of outreach models to deliver services outside the health facility would further improve girls' access. Potential options include community-based distribution of contraceptives, including the introduction of the self-injectable contraceptive (DMPA-SC), or the implementation of a voucher system with pharmacies in

the camps [10, 32–34]. More information is needed on girls' preferences regarding contraception and their perceptions of the best method, particularly for those who reported infrequent sexual activity, the most commonly cited reason for non-use [35, 36].

Overall, adolescent girls' SRHR knowledge was mixed. Adolescents in this setting reported similar or better knowledge of contraceptive methods compared to refugee adolescents in other settings [37–39], although knowledge of condoms was low. Younger adolescents were least knowledgeable about SRHR topics in the survey compared to older girls. Global data on very young (10–14 years) adolescents' access to sexuality and contraceptive education are limited, but generally found to be inadequate [40, 41]. Very young adolescents represent a key demographic often overlooked in humanitarian settings and that SRHR educational and norm-changing programs should target, as many of them have not yet, or only recently, started, engaging in sexual activity [40, 41].

Adolescent girls and mothers reported talking to each other about some SRHR topics, albeit with some discomfort. Fathers were categorically opposed to adolescent sexual activity and contraceptive use before marriage, and thus were largely absent from these parent-adolescent conversations, similar to elsewhere in Sub-Saharan Africa [4]. Despite some apprehension, several mothers indicated their willingness to help and support their unmarried daughters use contraception to avoid the severe consequences of unintended pregnancy. This is important because girls described being afraid of their parents' reactions if they got pregnant. Due to girls' discomfort discussing some SRHR topics with parents, schools and teachers may be more acceptable sources of SRHR information for this population, a strategy that is well-documented in other refugee contexts and is particularly appropriate here given girls' high school enrollment [40, 42]. ProGeSan's efforts to deliver SRHR training to both teachers and peer educators in these schools should be strengthened and grounded in gender-transformative approaches, with a focus on pregnancy prevention.

Despite the stigma around adolescent sexual activity in this community, 21% of adolescents reported having already had sex. The majority reported a sexual debut between ages 15 and 17, similar to findings among South Sudanese refugee adolescents in Uganda [43]. Given that younger girls were less likely to be married, they were also more likely than older girls to report that their first sexual partner was a boyfriend and close to them in age as opposed to an older husband. This suggests that some girls are finding boyfriends among their peers and challenges the misconception that girls in this population are only sexually active after marriage. It is, therefore, critical to ensure access to SRHR information and services for unmarried girls and not limiting them only to married girls. However, it is important to note that more than half of younger girls still reported an older sexual partner. Although it did not arise in the participatory research, this may be due to adolescents trading sex to meet survival needs as seen in other displacement settings [44].

Our findings suggest that younger girls had lower self-efficacy to refuse sexual activity. Although the evidence is mixed, sexual refusal self-efficacy may be associated with reduced risky sexual behaviors [45, 46]. Similarly, the second most common reason cited for not using contraception was because the decision to get pregnant is 'up to God.' This could be related to a lack of self-efficacy or feeling they are not empowered to make decisions about conception or contraceptive use, or that pregnancy and children are an act of God as documented among young women in other settings [47, 48]. Contraceptive nonuse may also be linked to the religious and social taboos prohibiting premarital sex in this context [49]. Smaller proportions of girls reported opposition to use, primarily from their partner, which is a strong factor influencing contraceptive use and discontinuation in many settings [50–53]. The assertion that husbands are the decision-makers regarding contraception was reiterated in the parent focus groups.

The decision-making role that husbands have, as well as the relatively less supportive attitudes of the fathers in our study, further reinforce the need for gender-transformative programming, including promotion of healthy couples' communication [54]. These efforts should target adult community members, especially men and religious leaders, as well as adolescent girls and boys. Expansion of IRC's Girl Shine program which seeks to support, protect and empower girls and other comprehensive sexuality education can strengthen girls' negotiation, sexual self-efficacy and decision-making skills [45, 55, 56]. Given boys' role as current and future sexual partners, gender-transformative programming engaging boys as well as girls is critical to improve adolescent SRHR outcomes [57, 58].

While few girls reported they would end an unintended pregnancy, which is not uncommon [59], nearly all groups in the participatory activities placed an abortion after a premarital pregnancy on the girls' timelines and discussed abortion as a practical option, and nearly 40% of girls knew someone in the camp who had an abortion. Unmarried adolescents who become pregnant often face the dilemma of deciding which stigma is worse–having an abortion or carrying a premarital pregnancy to term [59–61]. However, girls were largely unable to describe methods used for abortion beyond taking unspecified pills. Although safe abortion is not currently provided at

the camp health centers (though post-abortion care is), Chad's 2002 Reproductive Health Law 006 permits abortion in some circumstances: to save the life of the woman, to preserve her physical or mental health, or in cases of rape, incest or fetal impairment [62, 63]. Although the decree of application associated with the corresponding article was approved by the Council of Ministers in 2018 [64], the law has largely not yet been implemented in Chad. While more research is needed on current abortion practices in the camp, it is important to address the clear need for safe abortion services by leveraging the legal changes and relative openness to discussing abortion in this population. The need for safe abortion services in the camps is likely increasing given the reports of widespread rape in the current Sudan crisis driving new arrivals to Chad [65].

Limitations

While multiple efforts were made to reach adolescents randomly selected for the survey, some were ultimately replaced by randomly selected peers in the same age group in the same or a nearby zone in the camp. It is unclear if adolescents who could not be found were different from those who were interviewed. During the group work for the participatory activities, adolescents sometimes discussed in a local language, which was not spoken by all of facilitators, meaning that some information may have been missed by the research team. Although interviewers reminded participants of the survey's anonymity and confidentiality, some adolescents may not have disclosed information about their sexual activity due to the general stigma around the topic or a prior negative sexual experience.

Conclusion

The study contributes to the evidence on adolescent SRHR in humanitarian settings. Gender transformative programming engaging girls and boys should be expanded to improve adolescent knowledge and self-efficacy with respect to SRHR. These efforts must also engage parents and community members to create an enabling environment for adolescent SRHR and reduce stigma. Despite community stigma towards premarital sex and contraception for adolescents, some adolescent girls in the camps successfully managed to obtain a contraceptive method, demonstrating both their interest in and need for contraception. Although midwives were largely supportive of adolescent access, expanding service delivery channels for contraception and making services more adolescent-responsive would further increase adolescent access, particularly for unmarried girls. It is critical to engage adolescent girls, both married and unmarried, so their perspectives and voices are central to these efforts.

Abbreviations

ASTBEF	Association Tchadienne pour le Bien-Etre Familial
CHW	Community health worker
DRC	Democratic Republic of the Congo
FGD	Focus group discussions
IRC	International Rescue Committee
IUD	Intra-uterine device
LARC	Long-acting reversible contraceptive
LMIC	Low- or middle-income country
ProGeSan	Protection, Gender and Health program
DMPA-SC	Subcutaneous depot medroxyprogesterone acetate (self-injectable contraceptive)
RAISE	Reproductive Health Access, Information and Services in Emergencies
SRH	Sexual and reproductive health
SRHR	Sexual and reproductive health and rights
TBA	Traditional birth attendant
VCAT	Values clarification and attitude transformation

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Authors' contributions

SEC, ANg, KV, SL, RM, VA participated in the study conception and design; SEC, ANg, TV, AD, TK, ANd, VA participated in implementation of the study; KV supported overall management; SEC, TV participated in analysis of the survey data; SEC, ANg, TV, AD, TK, MA, VD, YM, ST, RM, VA participated in coding and analysis of the qualitative data; SEC, TV drafted the manuscript; all authors reviewed and approved the final version of the manuscript. All authors had access to all the data; the corresponding author had final responsibility for the decision to submit for publication.

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Data availability

The datasets generated during the current study are not publicly available in accordance with the participants' consent process in which participants were informed that only the study team members may view their data and their data will not be used or distributed for future research studies but may be available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

Ethical approvals for all study components and consent procedures were obtained from Columbia University's Institutional Review Board (IRB-AAAT0905) and the Direction de la Recherche et de l'Innovation, Direction Generale Technique de l'Enseignement Superieur, de la Recherche et de l'Innovation in Chad. All participants aged 15 and over provided verbal informed consent. Because this study met the criteria for minimal risk, parental consent for 15–17 year olds was waived. For 12–14 year old participants, verbal informed consent was obtained from their parent or guardian followed by verbal assent from the adolescent. This study was conducted according to the ethical principles of the Declaration of Helsinki.

Consent for publication

Not applicable.

Competing interests
The authors declare no competing interests.

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