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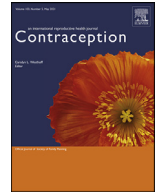
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Original Research Article

The impact of the COVID-19 pandemic on economic security and pregnancy intentions among people at risk of pregnancy^{☆,☆☆}

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ABSTRACT

Objective: To understand how the COVID-19 pandemic affected women of reproductive age, specifically their economic conditions, desire for pregnancy, and access to contraceptive services during the pandemic.

Study Designs: A total of 554 women respondents age 18 to 49 and reside in the United States were recruited using social media between May 16, 2020 and June 16, 2020. Logistic regression models assessed predictors of reporting pandemic-related changes in economic conditions, desire for pregnancy, and contraceptive access.

Results: Compared to White/Caucasian respondents, Hispanics/Latinx and Black/African Americans have 4 times the odds of experiencing inability to afford food, transportation, and/or housing ($p < 0.01$) during the pandemic; Hispanics/Latinx have twice the odds of experiencing food insecurity ($p < 0.05$). Inability to afford food, transportation, and/or housing was associated with drop in desire to be pregnant ($p < 0.01$). Despite the 25% of participants who reported a drop in desire for pregnancy, 1 in 6 reported difficulty accessing contraceptives, particularly those who experienced reduced income ($p < 0.01$).

Conclusions: In our sample, the pandemic unevenly affected people from different socioeconomic groups. Many simultaneously experienced reduced income, difficulties in accessing contraception, and a greater desire to avoid a pregnancy. This combination of factors increases the chance that people will experience unintended pregnancies.

Implications: The pandemic caused economic hardship and an increased desire to postpone or prevent pregnancy at the same time that it created new barriers to contraceptive services. This pattern may lead to a potential net effect of an increase in unintended pregnancy, particularly among people who had difficulty affording food, transportation, and/or housing during the pandemic.

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1. Introduction

The COVID-19 pandemic has disrupted economies and altered the lives of individuals. The negative economic impact of the pandemic disproportionately affected women – between February and April 2020 approximately 12 million women lost their employment, which accounted for 55% of job losses in the United States [1]. The pandemic's effect on economic security led many indi-

viduals to reconsider pregnancy timing, potentially generating a “baby bust” phenomenon [2], where economic shocks reduce fertility rates [3]. A report produced by the Guttmacher Institute, including 2009 cisgender women, indicated that during the COVID-19 pandemic, 36% of women wanted to delay childbearing and 27% of women wanted to have fewer children than previously planned [4]. Concerningly, given these preferences, 39% of respondents in the Guttmacher study reported they had to delay or cancel sexual and reproductive health care visits, including contraceptive care, due to the pandemic.

Worsening economic conditions can reduce the birth rate on a population level. [5] However, women of color and women in more vulnerable groups may be more likely to experience adverse economic effects during times of economic instability and also en-

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counter barriers to reproductive health care. This study aims to assess the impact of the COVID-19 pandemic on economic conditions and reproductive health decisions related to childbearing and pregnancy; specifically, this study evaluates if, during the initial months of the COVID-19 pandemic, vulnerable populations experience different financial and reproductive health outcomes compared to the general population.

2. Methods

Recruitment occurred through social media during a one-month period between May 16, 2020 and June 16, 2020. Advertisements targeting women age 18 to 49 who reside in the United States were placed on Facebook and Instagram; the geographic location target function on the advertisement platform was used to ensure a more geographically representative sample. Interested individuals had to send an email to the study team to request a survey link. The survey was administered on the online Qualtrics platform. People of reproductive age (18–49 years old), who were female at birth and who reported having had sex with a man in the past 4 months were eligible to participate. Individuals who met inclusion criteria were sent the consent form. Research team members screened initial email and entries for potential fraud; for example, repeated entries from the same geolocation or IP address were deemed ineligible. Eligible respondents who completed the survey received a \$25 gift certificate. The study and research design received an exempt status from the University of California, San Francisco Institutional Review Board.

The survey asked respondents' age, race/ethnicity, relationship status, number of children, household size and income, employment status before and during the pandemic, income before and during the pandemic, and state of residence. For employment status and income before the onset of the pandemic, we asked respondents to report their employment status and income in the month before March 10, 2020, when US cities, counties, and states started implementing pandemic-related policies. We then calculated whether household income was below or above the federal poverty level relative to household size before the pandemic. In a separate question, we asked respondents to indicate if there was a change to their income from before the pandemic to the current time (respondents selected a response from the choice set of no change, higher, lower).

To further measure the economic impact of the pandemic we asked participants to indicate whether they were unable to afford food, transportation, and/or housing, both prepandemic (in February 2020) and during-pandemic. We also included the Food and Agriculture Organization's Food Insecurity Experience Scale (FIES), which captures respondent's reporting of any food deprivation (e.g. constraints on one's ability to obtain adequate food) both prior to and during the pandemic [6].

The survey asked if the respondent was at risk for severe illness from COVID-19 due to comorbid health conditions, specifying conditions, "such as asthma, heart conditions, lung disease, diabetes, liver disease, immunocompromised status or currently undergoing dialysis."

Respondent reported how concerned they were about contracting COVID-19 and the current status of the shelter in place orders where they lived.

The Desire to Avoid Pregnancy (DAP) scale, a validated measure of pregnancy intention [7] was included to measure respondents' desire to avoid pregnancy during the pandemic. High desire to avoid pregnancy is defined as above the mean DAP score in the sample. A separate question – which allowed respondents to select multiple-choice options – asked respondents how their desire to become pregnant has been affected by the pandemic (i.e.,

no change, want to be pregnant more, want to be pregnant less, scared to be pregnant, harder to afford a child).

We presented a set of questions about contraceptive use, including the type of contraceptive(s) used, number of times it has been used in the past 3 months, and how access to contraception changed during the pandemic. If a respondent indicated that it has been more difficult to access contraception, the survey then followed up with a question which asked how access became more difficult (i.e., unable to get prescription, hesitate to go to the pharmacy, unable to afford usual contraceptive(s), unable to afford any contraceptives, unable to get an IUD or implant placed, unable to get an IUD or implant removed, or other reasons due to the pandemic).

We asked about frequency of sexual intercourse in the past 30 days, whether it was the respondent's choice to have sex, and reason(s) for having sex if it was not their choice. We also separately asked how desire for intercourse as changed during the pandemic as well as whether they had experienced intimate partner violence in the past month. Respondents reporting intimate partner violence were provided a national hotline number for support, and assistance.

Statistical differences in the prepandemic and during-pandemic economic outcomes were evaluated using Chi-square tests. Logistic regression models were used to evaluate determinants of loss in income, food insecurity, drop in desire for pregnancy, and difficulty in accessing contraceptive(s) due to the pandemic.

3. Results

Overall, 897 individuals initiated the survey; 52 were ineligible and 291 were suspected to be fraudulent on the basis of a completion time of less than 5 minutes and/or duplicate IP address or geolocation with an existing participant. Our final sample included 554 respondents from 43 states in the United States; 47% of the respondents reported a current shelter in place order where they lived, 42% reported no shelter in place order, and 12% were not sure of the status of a shelter in place policy. Of the 554 respondents, 41% were age 18 to 24, 37% 25 to 34, and 23% 35 to 49; 53% were White, 15% Hispanic/LatinX, 12% Asian/Pacific Islander, 11% multiracial/multiethnic/other, 7% Black/African American, and 1% American Indian or Alaskan native. The majority of respondents had a high level of education, reporting having received a bachelor's degree (38%) and/or graduate degree (16%) (See Table 1).

Nearly all respondents (99%) identified as female; 0.5% identified as gender queer/gender nonbinary and 0.2% identified as trans male. At the time of the survey, 95% were not pregnant, 3% reported that they were pregnant, and 2% were unsure if they were pregnant. Some respondents had direct experience with COVID-19: 12% reported that either they or someone in their household had symptoms or a diagnosis of COVID-19. Among respondents, 20% had a comorbid condition, such as heart condition and diabetes, which is considered higher risk for developing severe COVID-19 illness. Overall, 20% of the respondents indicated that they were very worried about contracting COVID-19, 41% were somewhat worried, 34% were a little worried, and 5% indicated that they were not worried at all. Among those with comorbid conditions, 29% reported that they were very worried about contracting COVID-19.

3.1. The COVID-19 pandemic and financial security

We documented the effect of the pandemic on economic conditions and evaluated the predictors of increased economic insecurity. Employment ($p < 0.01$), food insecurity ($p < 0.01$), and ability to afford food, transportation, and/or housing ($p < 0.01$) all deteriorated during the pandemic compared to the period before. The percentage who was employed full-time decreased 13% points from 48% in February 2020 to 34% in the current month or last month

Table 1
Sociodemographic characteristics, basic COVID-19 living condition, and desire to avoid pregnancy (DAP) among survey respondents recruited via social media between May and June 2020

	%
Age	
18–24	41
25–34	37
34–49	23
Race/Ethnicity	
American Indian or Alaskan Native	1
Asian/Pacific Islander	12
Black or African-American	7
Hispanic/LatinX	15
Multiracial/Multiethnic	11
White	54
Education	
Less than high school diploma	1
High school diploma or GED	10
Some college/Associates/Technical Degree	35
Bachelor's degree	38
Graduate degree	16
Higher risk of severe COVID-19 illness	
Yes	20
No	80
Federal poverty level (prepandemic)	
Below	26
Above	67
Don't know	7
Living in place with shelter in place orders	
Yes	47
No	42
Not sure	11
Desire to avoid pregnancy scale	
0–<1	8
1–<2	8
2–<3	19
3–<4	47
4	18

N = 554. Percentages do not add up to 100% due to rounding.

of the shelter in place, for those whose shelter in place order had lifted. Those who were employed part-time decreased from 27% to 17%, and those who were unemployed and looking for work more than quadrupled from 4% to 17% (Table 2). In assessing how their income had changed due to the pandemic, 46% reported lower income, 43% reported no change, and 10% reported higher income.

During the pandemic, respondents whose household incomes was already below the federal poverty level prior to the pandemic (26% of the sample) reported 3 times the odds of experiencing a loss of income (OR = 3.2, CI 2.0–5.0) compared to those above federal poverty level. See Table 3. Age, race/ethnicity, and inability to afford food, transportation, and/or housing prior to the pandemic did not predict decreased income during the pandemic. However, those who only had some college/associate or technical degree have twice the odds of experiencing decreased income compared to respondents who have a graduate degree (OR = 2.4, CI: 1.3–4.3).

The percentage of respondents who reported difficulty in being able to afford food, transportation, and/or housing doubled (from 8% to 16%) during the pandemic. Predictors of inability to afford food, transportation, and/or housing include education, race/ethnicity, federal poverty level, and change in income (see Table 3). Those living below the federal poverty level prior to the pandemic have 4 times the odds of experiencing inability to afford food, transportation, and/or housing, compared to those whose income were above federal poverty level before the pandemic (OR = 4.2, CI:2.6–6.7).

Not surprisingly, those who reported decreased income have nearly 3 times the odds of experiencing inability to afford food,

transportation, and/or housing compared to those who did not report decreased income during the pandemic (OR = 2.7, CI:1.8–4.2). Compared to White/Caucasian respondents, Hispanics/Latinx (OR = 4.0, CI: 2.2–7.1), and Black/African Americans (OR = 4.0, CI: 1.8–8.4) have 4 times the odds of experiencing inability to afford food, transportation, and/or housing. Compared to those with a graduate degree, respondents with some college/associate or technical degree have twice the odds of experiencing inability to afford basic needs (OR = 2.4, CI: 1.2–4.9).

Reports of food insecurity using the FIES measure increased from 20% to 36% during the pandemic. The predictors for food insecurity included decreased income, education level, and prepandemic federal poverty level status (See Table 3). Respondents who experienced a loss of income due to the pandemic have nearly 3 times the odds of experiencing food insecurity compared to those who did not experience decreased income (OR = 2.8, CI: 1.9–4.2). Hispanic/Latinx respondents have twice the odds of experiencing food insecurity compared to White/Caucasian respondents (OR = 2.0, CI 1.1–3.4). There was a clear pattern of lower education attainment being associated with greater risk of food insecurity. Compared to respondents with a graduate degree, those with a bachelor's degree have twice the odds (OR = 2.2, CI: 1.2–4.5), with some college/associate/technical college degree have nearly 3 times the odds (OR = 2.8, CI 1.4–5.6), and high school diploma/GED have more than 4 times the odds (OR = 4.2, CI: 1.7–10.4) of experiencing food insecurity. Respondents who were below the federal poverty level prepandemic have 3 times the odds of experiencing food insecurity (OR = 3.1, CI: 2.0–4.8) compared to those who were above the federal poverty level.

3.2. Impact of the COVID-19 pandemic on sexual frequency and desire and intimate partner violence

The survey included only respondents who reported having had sex at least once in the past 4 months. Within this sample, most respondents (83%) reported having had sex in the past month – just over half (54%) had sex with someone they live with, and 29% had sex with someone they were not living with. In regard to desire for sex during the pandemic, 37% of respondents reported that the pandemic had not changed their desire for sex, 32% reported the pandemic made them want to have sex less, and 29% reported that the pandemic made them want to have sex more. For those who have had sex in the past month, 73% indicated they wanted to have sex every time, 25% indicated sometimes they agreed to have sex even when they did not want to, and 1% indicated they were forced to have sex. Whether or not they were currently under shelter in place orders did not affect the frequency of or desire for sex. Four percent of respondents reported intimate partner violence in the past month, 1% point higher than before the pandemic (3%).

3.3. Impact of the COVID-19 pandemic on desire for pregnancy

The pandemic affected many respondents' desire for pregnancy. When asked "How has your desire to be pregnant been affected by the pandemic?" 41% reported wanting to be pregnant more, 25% wanting to be pregnant less, and 34% reported no change or other. More than a third (37%) reported that the pandemic made them scared to be pregnant and 1 in 7 (13%) reported that it would be more difficult to afford a child. Those who reported inability to afford food, transportation, and/or housing had twice the odds of reporting a drop in desire to be pregnant (OR = 2.1, CI: 1.2–3.2) compared to those who reported being able to afford basic needs (See Table 4).

Table 2
Economic and financial situations before and during the COVID-19 pandemic

	Before pandemic (%)	During pandemic (%)
Employment status*		
Employed full time	48	34
Employed part time	27	17
Unemployed and looking for work	4	17
Unemployed and not looking for work	3	9
Homemaker	7	7
Unable to work	1	7
Student	8	4
Other	3	4
Federal poverty level		
Below 100% FPL	26	-
Above 100% FPL	67	-
Don't know	7	-
Inability to afford food, transportation and/or housing*		
Never	70	63
Rarely	19	14
Some of the time	8	16
Most of the time	2	5
All the time	1	2
Food insecurity*		
Yes	20	36
No	80	64

Total percentages do not add up to 100% due to rounding.

* $p < 0.05$ using Chi-square tests.

Table 3

Characteristics associated with the likelihood of lower income, subjective poverty and food insecurity during the COVID-19 pandemic: Odds ratios from logistic regression models

Variables	(1) Loss of income during pandemic* <i>n</i> = 554 OR (95% CI)	(2) Inability to afford food, transportation, housing <i>n</i> = 554 OR (95% CI)	(3) Food insecurity during pandemic <i>n</i> = 554 OR (95% CI)
Decreased income		2.75 (1.81–4.17)	2.80 (1.88–4.17)
Age (reference: 34–49)			
18–24	1.19 (0.72–1.96)	0.68 (0.38–1.21)	0.82 (0.47–1.41)
25–34	1.24 (0.77–2.01)	0.84 (0.48–1.45)	0.93 (0.54–1.59)
Race/Ethnicity (reference: White/Caucasian)			
Hispanic/Latinx	1.20 (0.70–2.06)	4.01 (2.25–7.15)	1.95 (1.12–3.40)
Asian/Pacific Islander	1.31 (0.75–2.27)	1.19 (0.62–2.27)	0.65 (0.34–1.25)
Black/African American	1.11 (0.54–2.29)	3.92 (1.81–8.50)	1.41 (0.67–3.00)
American Indian/Alaskan Native	0.15 (0.02–1.54)	-	1.00 (0.13–7.85)
Multiracial/Multiethnic/Others	1.44 (0.79–2.62)	2.12 (1.10–4.07)	1.36 (0.72–2.59)
Education (reference: Graduate Degree)			
Less than 12th grade	1.26 (0.15–10.66)	7.53 (0.46–123.81)	13.14 (0.88–196.45)
High school diploma/GED	2.04 (0.93–4.51)	1.68 (0.66–4.33)	4.24 (1.73–10.41)
Some or technical college/associate degree	2.38 (1.31–4.34)	2.39 (1.17–4.87)	2.77 (1.36–5.65)
Bachelor's degree	1.57 (0.89–2.79)	1.81 (0.91–3.63)	2.24 (1.12–4.51)
Below Federal poverty level (reference: above poverty)	3.19 (2.05–4.98)	4.20 (2.64–6.67)	3.11 (1.99–4.84)

* Loss of income during the pandemic is compared to 2 other categories: (1) no loss of income and (2) income gains during the pandemic.

3.4. Impact of the COVID-19 pandemic on access to contraception

One in 6 (17%) reported that access to contraceptives had become more difficult during the pandemic (20% of those who were currently using). Only 4% reported that access had become easier. Looking at specific ways in which access had become more difficult during the pandemic: 9% reported it was harder to get to a

pharmacy, 4% reported it was harder to afford contraceptives, 3% reported it was harder to get a prescription, 2% reported it was harder to have long-acting reversible contraceptives placed, and 1% reported it was harder to have long-acting reversible contraceptives removed.

Predictors of difficulty in accessing contraceptive(s) during the pandemic included high desire to avoid pregnancy (OR = 2.0, CI

Table 4
Impact of COVID-19 pandemic and economic conditions on fertility intentions and contraceptive access

Variables	(1) Reports drop in desire for pregnancy due to pandemic <i>n</i> = 531	(2) More difficult access to contraceptives <i>n</i> = 535
	OR (95% CI)	OR (95% CI)
High DAP	1.34 (0.84–2.12)	2.01 (1.11–3.62)
Age (reference: 34–49)		
18–24	0.80 (0.44–1.44)	1.62 (0.76–3.47)
25–34	0.86 (0.50–1.48)	1.79 (0.84–3.79)
Race/Ethnicity (reference: White/Caucasian)		
Hispanic/Latinx	1.13 (0.63–2.01)	1.39 (0.72–2.70)
Asian/Pacific Islander	0.80 (0.41–1.54)	0.64 (0.28–1.43)
Black/African American	0.53 (0.22–1.29)	0.76 (0.28–2.11)
American Indian/Alaskan Native	1.45 (0.22–9.55)	1.70 (0.16–18.28)
Multiracial/Multiethnic/Others	0.54 (0.26–1.12)	0.50 (0.21–1.22)
Education (reference: Graduate Degree)		
Less than 12th grade		14.32 (1.53–133.99)
High school diploma/GED	0.59 (0.23–1.50)	3.48 (1.02–11.85)
Some college/Associate/technical degree	0.65 (0.33–1.26)	2.47 (0.86–7.09)
Bachelor's degree	1.07 (0.58–1.99)	2.54 (0.90–7.15)
Reports decreased income due to pandemic	1.11 (0.72–1.72)	2.18 (1.30–3.67)
Below Federal poverty level	1.00 (0.60–1.66)	0.96 (0.55–1.69)
Inability to afford food, transportation, housing	2.13 (1.32–3.43)	1.86 (1.06–3.24)

Models contain only women who were not pregnant.

1.1–3.6), decreased income (OR = 2.1, CI 1.3–3.7), and inability to afford food, transportation, and/or housing (OR = 1.9, CI: 1.1–3.2) (See Table 4).

4. Discussion

The pandemic had varying, detrimental effects on economic conditions, access to family planning, and reproductive health intentions. Especially critical to women's health, of the risk factors currently known to be associated with poor COVID-19 outcomes, vascular risk factors are also associated with increased risk of pregnancy complications. The pandemic has disproportionately affected people living in poverty and people of color and their access to contraception.

We find that almost half of the respondents (46%) reported a loss of income during the pandemic compared to prepandemic; the percentage of respondents with reduced income in this sample was higher than in the Guttmacher survey (32%) [4]. Consistent with other studies, we found that people already living below the federal poverty level were more likely to experience a loss of income during the pandemic.

The percentage of respondents indicating that at times they could not afford basic living needs nearly doubling during the pandemic from 8% to 16%; those whose household income that fell below federal poverty level have greater odds of experiencing inability to afford food, transportation, and/or housing and food in-

security during the pandemic. This finding is in line with reported food insecurity in the general population; prior to the pandemic, in 2018, 11.1% of United States' households were considered food insecure at some point during the year [8] and data consistently indicated that women, particularly mothers with dependents, were especially vulnerable to food insecurity. [9] The findings here highlight changes in food insecurity among people of reproductive age in the US during the pandemic and how women in more vulnerable groups may be disproportionately impacted by the pandemic.

This study shows that a major factor affecting desire for pregnancy was inability to afford food, transportation, or housing during the pandemic. One in 4 respondents expressed a decreased desire to become pregnant and over 1 in 3 reported that the pandemic made them scared to be pregnant.

Given that a significant minority of respondents report a drop in desire for pregnancy, it is concerning that nearly 1 in 6 respondents expressed difficulties accessing contraceptives. Moreover, there was a statistically significant association between drop in desire for pregnancy and increased difficulty accessing contraceptives. This pattern suggests that people seeking to avoid pregnancy were also encountering difficulty in accessing the health care they needed to achieve their reproductive health goals. The increased difficulty in contraception access for those who wanted to avoid pregnancy may place many people at a higher risk of unintended pregnancy.

Our study has some limitations. This study relies on a cross-sectional survey, where respondents were asked to recall their economic conditions before the pandemic; to minimize recall errors, we included specific questions on employment, income and household size as well as self-reported change in income prior to and during the pandemic. The recruitment of survey respondents through social media resulted in a sample of people who were more educated (16% with advanced degrees) than the national average (13%) [10]. Of note, this sample of respondents with higher education level may explain why a lower proportion of respondents in this sample experienced difficulties in contraception access compared to the sample of respondents in the survey conducted by the Guttmacher Institute [4]. Similarly, the sample included a higher percentage of Asian/Pacific Islands at 11%, compared to the national average of approximately 6%. In this study, eligibility criteria included sex with a man in the past 4 months, however, sex was not specifically defined in the survey as vaginal-penile intercourse, thus the survey sample may include individuals who were engaging in other types of sex and may not be at risk of pregnancy. At last, there is likely under reporting of intimate partner violence in our sample; possibly because disclosure may have been difficult for people sheltering with abusive partners.

With online and social media recruitment, there are uncertainties regarding the source population. We sampled a population of slightly younger and more educated respondents, one with easier access to the Internet as compared to the general population. In the era of the COVID-19 pandemic, we were limited to recruitment through social media. Future studies using alternate data sources are needed to confirm these estimates.

The findings from this study add to other published studies. A study by researchers at the Guttmacher Institute found that 36% of women wanted to delay childbearing and 27% of women wanted to have fewer children than previously planned [4]; our study adds some detail to explain this finding. We find that 37% reported the pandemic made them scared to be pregnant and 25% wanted to be pregnant less. We find one area of difference from the Guttmacher study: 20% of women we sampled who were currently using contraceptives indicated it has been harder to access contraceptives while 39% of respondents in the Guttmacher study reported they had to delay or cancel general sexual and reproductive health care visits, including contraceptive care, due to the pandemic. A recent survey study on the impact of the COVID-19 pandemic on sexual and reproductive health in China [11] suggests that increased difficulty in accessing reproductive health care is not unique to the US and may be generalizable worldwide. The results from our logistic regression model provide predictors for these difficulties.

The findings from this study offer insight into how the pandemic impacted economic conditions and reproductive health and family planning intentions. The pandemic disproportionately affected people of color, resulting in significant negative economic impacts for those people who identify as Hispanic and Black, as

compared to those who identify as White. During the pandemic, our study found that increased desire to avoid pregnancy and decreased income were both associated with increased difficulties in access to contraception. These findings suggest that barriers to contraceptive access and family planning services were heightened during this vulnerable time when women may have increased need for them. This difficulty in accessing contraceptive methods places women at increased risk of experiencing unintended pregnancy. In these uncertain economic times, it is of utmost importance to create policies that will ensure access to and comprehensive coverage of core sexual and reproductive health services. By doing so, we safeguard people's ability to make decisions that support their reproductive health goals.

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