Factors associated with contraceptive use among reproductive-age women during a pandemic: Evidence from a small developing state

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Abstract

Background: The COVID-19 pandemic disrupted access to sexual and reproductive health (SRH) services, including contraception. Understanding contraceptive use during this period is critical for strengthening health system resilience in small developing states.

Objective: To identify factors associated with contraceptive use among reproductive-age women during the COVID-19 pandemic in Barbados.

Methods: A cross-sectional online survey was conducted in Barbados between April 28 and May 3, 2020 among adults aged ≥18 years. This analysis is restricted to women aged 18–49 years. Current contraceptive use (yes/no) was assessed among non-pregnant respondents. Associations with sociodemographic factors, relationship status, and psychosocial distress (Hospital Anxiety and Depression Scale [HADS] were examined using bivariate tests and logistic regression. Variables, alcohol and marijuana use had >15% missing data which limited.

Results: A total of 1,094 women aged 18–49 years completed the survey and were included in descriptive analyses. At the time of the survey, 2.7% (n=29) reported being pregnant and 7.3% (n=80) reported not being pregnant but planning pregnancy; the majority 89.7%, (n=981) were neither pregnant nor planning pregnancy. Among non-pregnant women with contraceptive data, 34.2% (n=333) reported current contraceptive use.

Moderate-to-severe anxiety symptoms were reported by 36.5%, and moderate or clinically significant global distress by 39.0%. Contraceptive use was significantly

associated with HADS anxiety (p=0.021) and HADS global distress (p=0.016), but not depression (p=0.211). Women who were partnered (p=0.014) or married/cohabitating (p<0.001) were more likely to report contraceptive use compared with single women. University education was strongly associated with contraceptive use (p<0.001). Women aged 26 - 39 years were more likely to use contraception relative to those aged 40 - 49 years, while women aged 18 - 25 years were less likely.

Conclusions: During the early phase of the COVID-19 pandemic in Barbados, contraceptive use among non-pregnant reproductive-age women was associated with psychosocial distress (especially anxiety), relationship status, education, and age. Emergency preparedness in small developing states should prioritize continuity of SRH services, mental health integration, and access to self-managed contraceptive options.

Introduction

Sexual and reproductive health (SRH) is a core component of global health strategies and is grounded in the recognition of sexual health as a fundamental human right, including the right to access family planning services and comprehensive reproductive care (1). Despite this recognition, SRH services are frequently deprioritized during public health emergencies. During the early phase of the COVID-19 pandemic, disruptions to health systems worldwide substantially reduced access to SRH services, with women disproportionately affected (2)(3)(4)(5) .

Although a growing body of literature has documented the impact of COVID-19 on SRH services, particularly in low- and middle-income countries, these data often fail to capture the lived realities of small island developing states (SIDS), including those in the Caribbean (3). Because of their small populations, limited health infrastructure, geographic isolation, and constrained fiscal space, Caribbean SIDS experience distinct vulnerabilities that shape access to and quality of healthcare services (6-8). Regional analyses frequently aggregate Caribbean countries with Latin America, masking heterogeneity and obscuring the specific needs of smaller island nations whose health systems operate under markedly different structural constraints (9, 10).

Over the past three decades, Caribbean countries have made notable progress in advancing sexual and reproductive rights following the articulation of SRH as a global health priority (11). Legislative and policy reforms have strengthened protections for women's and children's health; however, implementation gaps persist. These gaps are driven by limited resources, workforce constraints, and uneven translation of policy into

service delivery (12, 13). Moreover, the region's exposure to natural disasters, including hurricanes and other climate-related shocks, regularly disrupts economic and social systems, further threatening the continuity of SRH services (11).

In recognition of crisis-related vulnerabilities, many Caribbean countries have invested in preparedness frameworks such as the Minimum Initial Service Package (MISP) for SRH in emergencies, now considered a global standard (11). While progress has been made in policy adoption, important gaps remain in research capacity, sustainable financing, and operational implementation. For example, although several countries report high levels of domestic financing for HIV and reproductive health programs, data on funding and service provision for gender-based violence prevention and response are limited (9, 14) . Furthermore, monitoring and evaluation of SRH programs in the region often rely on administrative reporting or anecdotal evidence rather than systematic empirical research (15) (14).

Contraceptive availability and use remain important to improving SRH outcomes, as they directly influence women's reproductive autonomy, economic participation, and overall wellbeing (16) . According to recent regional assessments by United Nations Population Fund, progress toward meeting contraceptive needs in the Caribbean has been uneven (11). Contraceptive methods remain heavily skewed toward male condoms and injectables, while access to long-acting reversible contraceptives and emergency contraception remains limited in many countries (17, 18). These structural limitations increase vulnerability to service disruptions during crises.

Globally, the consequences of pandemic-related SRH disruptions have been substantial. In 2021, UNFPA estimated that approximately 12 million women experienced

interruptions in contraceptive services, resulting in 1.4 million unintended pregnancies, the majority occurring in low- and middle-income countries (19). Small developing states are particularly susceptible to such disruptions due to limited-service redundancy and fragile supply chains. In the Caribbean, these vulnerabilities are reflected in persistently high adolescent birth rates, which remain among the highest worldwide (20) (20). In 2023, the adolescent birth rate in Latin America and the Caribbean was estimated at 51.4 births per 1,000 girls aged 15–19, with many pregnancies unintended and associated with increased risk of unsafe abortion and adverse maternal outcomes.

Despite these concerns, empirical evidence on the impact of COVID-19 on SRH in Caribbean SIDS remains sparse. A major scoping review of 83 studies on SRH service disruptions during the pandemic included only four studies from Latin America and the Caribbean, highlighting a significant regional evidence gap (2). Available studies indicate widespread reductions in access to contraception, abortion care, STI/HIV services, and gender-based violence support, even in settings with relatively well-resourced health systems that adopted telehealth models (21). Adolescents and other vulnerable populations appear to have been disproportionately affected due to school closures, reduced youth-friendly services, and prolonged periods of unstructured time (2)(22).

In the Caribbean context, limited data infrastructure and variation in pandemic mitigation strategies complicate efforts to systematically assess COVID-19's impact on SRH. At the same time, close-knit social networks, household structures, and gendered economic roles may shape reproductive decision-making in ways that differ from larger or more resourced regions (23).

This study investigates the factors associated with contraceptive use during the pandemic, with a focus on psychosocial health, education, age, and relationship status in a small island developing country in the Caribbean.

Methods

Study Design and Participants:

This study is part of a larger cross-sectional survey of Barbadian experiences of COVID-19 and associated public health control measures during the early phases of the pandemic. The survey instrument utilized a modified version of the *Public Response to UK Government Recommendations on COVID-19: Population Survey, 17-18 March 2020* questionnaire (24).

The survey link was shared as text blasts to subscribers by two major Barbadian cellphone service providers alongside their product marketing. Additionally, recruitment continued by snowballing via personal, religious, media, and other civil society networks. In Barbados, these two dominant cell phone providers often advertise products to their clients through text blasts with extensive reach. The number of cell phone connections in 2020 was equivalent to 117 % of the population of Barbados (25).

On opening the survey link, participants needed to read informed consent information and give approval before completing the survey. Eligible participants ≥18 years and

resident in Barbados for ≥3 months, were recruited between April 28 and May 3, 2020. The participant information sheet detailed the purpose of the survey, possible risks and benefits, data protection information, and the right to withdraw from the survey without penalty. It was estimated that the survey would take approximately 25 minutes to complete.

The survey included questions on participants' knowledge of COVID-19, current and perceived impact of the pandemic on people's health and well-being. Additionally, questions on pregnancy, use of contraceptives, and access to contraceptives were included, as were items related to sociodemographic, general health, and mental health status, including the Hospital Anxiety and Depression Scale (HADS) (26).

This study presented minimal risk to participants. The survey consisted of self-reported questions related to experiences during the COVID-19 pandemic and did not involve interventions or procedures expected to cause harm. The level of risk was considered no greater than that encountered in routine daily life during the pandemic. Participation was voluntary, and safeguards were implemented to ensure confidentiality and data protection. No incentive was offered to participants. Upon completion, participants were provided with referral information for optional governmental community-based social support resources.. IRB approval was obtained from the University of the West Indies – Cave Hill/Barbados Ministry of Health IRB No.200405-B.

Measures

Current contraceptive use (yes/no) was assessed among women aged 18-49 years who reported not being pregnant at the time of the survey. Pregnancy status was measured

first; women who were pregnant were excluded from contraceptive-use analyses. Contraceptive use was measured using the question: “Have you been using any method of birth control over the past two months?” Reasons for non-use were assessed with a multi-option item allowing respondents to select applicable reasons.

This sample for this analysis includes only adult women of reproductive age as defined by the World Health Organization (we used 18-49 as in Barbados, those under 15 years are considered children). Current contraceptive use (yes/no) was assessed among women who reported not being pregnant at the time of the survey. Pregnancy status was measured first; women who were pregnant were excluded from contraceptive-use analyses. Contraceptive use was measured using the question: “Have you been using any method of birth control over the past two months?” Reasons for non-use were assessed with a multi-option item allowing respondents to select applicable reasons (I did not expect to have sex, I am worried about the side effects of contraception, my male partner does not want me to use contraception, etc.). Independent variables included: Mental health status assessed through the Hospital Anxiety and Depression Scale (HADS) (Anxiety (HADS-A), Depression (HADS-D), and global score; relationship status (single, in a relationship, married, divorced/separated); education (tertiary education (university degree) versus lower); age (18–25, 26–39, and 40–49); and other behavioral variables. Variables with more than 15% missing data were excluded from the analysis, with exceptions of marijuana and alcohol use.

Statistical Analysis: Descriptive statistics were generated for key study variables. Associations between current contraceptive use (yes/no) and each independent variable were examined using bivariate methods. For categorical predictors, we estimated univariable logistic regression models (one predictor at a time) and evaluated statistical significance using likelihood ratio (LR) tests. These univariable models were used to assess association, analogous to chi-square testing, and were not intended to support causal inference or multivariable prediction. Although marijuana and alcohol use each had >15% missing values, we analyzed them due to their importance in previous research (27-29); however, caution is warranted in interpretation of findings regarding substance use. Analyses were conducted in SPSS v28.

Results

A total of 1,094 women aged 18-49 years completed the survey and were included in the analyses (Table 1). At the time of the survey, 2.7% (n=29) reported being pregnant and 7.3% (n=80) reported not being pregnant but planning pregnancy; the majority (89.7%, n=981) were neither pregnant nor planning pregnancy.

Table 1. Sociodemographic, Health, and Psychosocial Characteristics of Reproductive-Age Women in Barbados, 2020

Characteristic	n	%
Age group (years)		

18–25	237	21.6
26–39	549	50.2
40–49	308	28.2
Relationship status		
Single	364	33.8
Partnered (not cohabitating)	348	32.3
Married/cohabitating	333	30.9
Separated/divorced/widowed	31	2.9
Education		
Less than high school	18	1.7
High school	159	15.2
College	247	23.6
University	621	59.4
Race/ethnicity		
Black	873	83.3
East Asian	4	0.4
White	23	2.2
Indian	68	6.5

Mixed	80	7.6
Children in household		
None	530	49.4
One	269	25.1
Two	179	16.7
Three	61	5.7
Four or more	33	3.1
General health status		
Good	288	27.2
Fairly good	519	49.0
Average	189	17.8
Poor	63	5.9
Mental health (HADS)		
Anxiety – none/mild	631	63.5
Anxiety – moderate/severe	363	36.5
Depression – none/mild	600	59.1
Depression – moderate/severe	415	40.9
Global distress – none/mild	646	61.0

Global distress – moderate/clinically significant	409	39.0
Current contraceptive use*		
Yes	333	34.2
No	640	65.8

Percentages may not add up to 100 due to rounding.

Contraceptive use assessed among non-pregnant women only.

Variables with >15% missing data (e.g., alcohol, marijuana use, violence exposure) are described elsewhere and not included in inferential analyses.

Among non-pregnant women with contraceptive data, 34.2% (n=333) reported current contraceptive use and 65.8% (n=640) reported no contraceptive use. Among contraceptive users reporting method type, short-acting reversible methods were most common (53.7%, n=194), followed by long-acting reversible contraception (24.4%, n=88). Permanent (3.6%), natural methods (2.2%), and other methods were less frequently reported.

Psychosocial distress and contraceptive use

In univariable analyses, HADS anxiety scores were associated with contraceptive use (p=0.021), and HADS global distress scores were also associated (p=0.016), whereas HADS depression scores were not (p=0.211) (Table 2). Contraceptive use also differed by relationship status (partnered vs single: p=0.014; married/cohabitating vs single: p<0.001), education (university vs non-university: p<0.001), and age group (overall association p<0.001).

Table 2. Univariable Associations Between Selected Factors and Current Contraceptive Use

(Likelihood ratio tests from single-predictor logistic regression models)

Variable	Comparison / Reference	p-value
HADS Anxiety	None/mild (ref)	
	Moderate	0.288
	Severe	**0.026**
HADS Depression	None/mild (ref)	
	Moderate	0.539
	Severe	0.106
HADS Global Distress	None/mild (ref)	
	Moderate	0.109
	Clinically significant	**0.033**

Variable	Comparison / Reference	p-value
Relationship status	Single (ref)	
	Partnered (not cohabitating)	**0.014**
	Married/cohabitating	**<0.001**
	Separated/divorced/widowed	0.490
Education	University vs. non-university	**<0.001**
Age group (years)	40–49 (ref)	
	33–39	**<0.001**
	26–32	**<0.001**
	18–25	0.297
Alcohol use (pre-COVID)†	Never (ref)	0.036
Marijuana use†	Never vs. ever	0.047

Footnotes:

LR = likelihood ratio test from univariable logistic regression (one predictor at a time).

Bold indicates $p < 0.05$.

†Variables had >15% missing data and were interpreted cautiously; results shown for completeness only.

Symptoms of anxiety and depression were common during the early phase of the pandemic. Based on HADS subscales, 36.5% of respondents reported moderate-to-severe anxiety symptoms (levels 2–3), and 41.0% reported moderate-to-severe depressive symptoms (levels 2–3). For the HADS global score, 39.0% of women reported moderate or clinically significant distress, including 14.1% classified as clinically significant.

Contraceptive use was significantly associated with anxiety symptoms and overall distress. HADS anxiety scores were associated with contraceptive use ($p=0.021$), with higher-anxiety respondents demonstrating greater likelihood of contraceptive use compared to the reference category. Similarly, HADS global distress was significantly associated with contraceptive use ($p=0.016$). In contrast, depressive symptoms alone were not significantly associated with contraceptive use ($p=0.211$).

Sociodemographic and relationship correlates

Relationship status was strongly associated with contraceptive use. Compared with single women, those who were partnered but not cohabitating were more likely to use contraception ($p=0.014$), and those married or cohabitating showed a stronger association ($p<0.001$). No association was observed among women who were separated, divorced, or widowed ($p=0.49$).

Education also showed a strong association: women with university education were significantly more likely to report contraceptive use than those with lower educational attainment ($p<0.001$).

Age was associated with contraceptive use, with women aged 26–39 years more likely to use contraception relative to women aged 40–49 years, while women aged 18–25 years were less likely (overall age association $p<0.001$ in age quartile comparisons).

Household context and health behaviors

Nearly half of respondents reported being the main household income earner (46.6%), while approximately one-third reported that parents/grandparents were the primary earners (33.2%). In breadwinner comparisons, having a partner as the primary income earner was significantly associated with contraceptive use relative to self-earners ($p=0.002$).

Most women (84.6%) reported not stockpiling condoms or birth control during the early pandemic. Alcohol and marijuana use were examined but had >15% missing data; nonetheless, both variables demonstrated positive bivariate associations with contraceptive use (alcohol $p=0.036$; marijuana $p=0.047$). These findings should be interpreted with caution.

Reasons for non-use of contraception

Among women who were not pregnant and not using contraception, common reasons included not expecting to have sex (17.1%), concerns about side effects (13.2%), and believing pregnancy was unlikely (9.3%). Partner opposition to contraception or condoms was infrequently endorsed (<1%). A sizable proportion selected “other” (20.8%), suggesting heterogeneity in barriers and motivations.

Discussion

This study examined factors associated with contraceptive use among reproductive-age women during the early phase of the COVID-19 pandemic in a Caribbean small island developing state. Consistent with global evidence of widespread disruption to sexual and reproductive health (SRH) services during the pandemic, contraceptive use in this sample was patterned by psychosocial distress, relationship status, education, and age. Importantly, these findings reflect associations observed in univariable analyses and should be interpreted as descriptive of early pandemic conditions rather than as causal or predictive relationships.

Mental health and contraceptive use during crises

One of the most notable findings was the association between anxiety symptoms and overall psychological distress and contraceptive use, while depressive symptoms alone were not associated. This pattern aligns with literature suggesting that anxiety, particularly during periods of acute uncertainty, may heighten risk-avoidant or protective health behaviors, including efforts to avoid unintended pregnancy (30). During the early COVID-19 period, anxiety related to economic instability, health system strain, and uncertainty about access to care may have motivated greater contraceptive vigilance among some women (31, 32).

In contrast, depressive symptoms are more consistently linked in the literature to reduced health-seeking behavior and diminished agency, which may help explain the absence of an observed association with contraceptive use in this analysis (33, 34). The distinction

277 between anxiety and depression is rarely examined in SRH research during emergencies,
278 particularly in small developing states, and this finding underscores the importance of
279 disaggregating psychosocial measures rather than relying on composite mental health
280 indicators alone.

281 For Caribbean SIDS, where mental health services are often under-resourced and
282 stigmatized (35), the observed linkage between psychological distress and contraceptive
283 behavior highlights the need to integrate mental health screening and support into SRH
284 service delivery, particularly during crises.

285 Relationship status, education, and reproductive autonomy

286 Consistent with prior research (36-39), women who were partnered or married were more
287 likely to report contraceptive use compared with single women. This finding reflects
288 well-documented patterns in which contraceptive use is shaped by relationship context,
289 perceived pregnancy risk, and negotiated decision-making within partnerships (40-42). In
290 the Caribbean context, where fertility norms, union stability, and gendered expectations
291 around contraception vary widely (43, 44), relationship status may serve as a proxy for
292 both sexual activity patterns and access to partner support for contraceptive use.

293 Educational attainment also showed a strong association with contraceptive use, with
294 women holding university degrees more likely to report use than those with lower
295 education. This finding aligns with global evidence linking education to health literacy,
296 reproductive autonomy, and navigation of health systems (45-47). In small island
297 settings, where method choice may already be constrained by supply limitations,

298 education may further influence awareness of available options and confidence in
299 engaging with providers.

300 Age gradients and unmet need among younger women

301 Age differences in contraceptive use were evident, with women aged 26–39 years more
302 likely to report use than those aged 40–49 years, while women aged 18–25 years were
303 less likely. Lower use among younger women mirrors global and regional evidence of
304 persistent unmet contraceptive need among adolescents and young adults (48-50). During
305 the pandemic, school closures, reduced youth-friendly services, and increased reliance on
306 household or parental environments may have further constrained access for younger
307 women in Caribbean settings.

308 This finding is particularly salient given persistently high adolescent and young adult
309 pregnancy rates in the region (51-53). It suggests that pandemic-related disruptions may
310 have reinforced pre-existing barriers to contraceptive access among younger women
311 rather than creating entirely new ones.

312 Contraceptive access in small island developing states

313 Although this study did not directly measure service availability, the low prevalence of
314 contraceptive stockpiling reported by participants suggests limited anticipatory behavior
315 in response to potential access disruptions. In SIDS, where contraceptive supply chains
316 are highly centralized and dependent on external procurement, even short interruptions
317 can disproportionately affect access (6, 54, 55). However, in our case, the population may
318 have been conditioned by a relative ease of access under normal circumstances, which

319 points to some measured success of Maternal and Child Health program (7). UNFPA
320 reported challenges in supply chain management, the logistics management information
321 system and the inventory control systems in reproductive health commodity security
322 across Caribbean countries with regards to oversupply in some areas and undersupply in
323 others, across the different countries (8). The predominance of short-acting methods
324 observed in this sample further underscores system-level vulnerability, as these methods
325 require regular resupply and consistent service contact.

326 These findings are consistent with regional reports indicating uneven contraceptive
327 method mix and limited availability of long-acting reversible contraception across
328 Caribbean countries (17, 18). During emergencies, such structural constraints may
329 amplify the impact of health system shocks on reproductive autonomy.

330 Contribution to the literature and regional relevance

331 This study contributes new empirical evidence from a Caribbean SIDS, addressing a
332 notable gap in the global literature on SRH during COVID-19. While numerous studies
333 have documented SRH disruptions in larger low- and middle-income countries,
334 Caribbean SIDS remain under-represented despite their unique structural vulnerabilities.
335 By linking psychosocial distress, sociodemographic characteristics, and contraceptive use
336 during the early pandemic phase, this analysis adds context-specific insight that is often
337 obscured in regional aggregates.

338 The findings are particularly relevant for emergency preparedness planning in SIDS,
339 where limited service redundancy, small workforces, and fragile supply chains increase
340 the importance of anticipatory, integrated SRH strategies. The observed associations

underscore the need to maintain contraceptive access alongside mental health support, especially for younger women and those with lower educational attainment.

Limitations

Several limitations should be acknowledged. The cross-sectional design precludes causal inference, and associations observed here may reflect unmeasured confounding, including fertility intentions, sexual activity, or access barriers. Analyses were restricted to univariable models and should be interpreted as exploratory. In addition, several behavioral variables had substantial missing data and were not emphasized in inferential conclusions. Finally, data were collected during the early phase of the pandemic and may not capture subsequent adaptations in service delivery.

Implications for policy and future research

Despite these limitations, the findings highlight actionable priorities for SRH policy in small developing states, especially in times of continual funding and policy changes of large donors (56). Emergency response planning should prioritize continuity of contraceptive services, expand access to self-managed and long-acting methods where feasible, and integrate mental health considerations into SRH programming. Future research should employ longitudinal designs and multivariable analyses to better understand pathways linking psychosocial distress and reproductive decision-making during crises, particularly among adolescents and young adults in SIDS contexts.

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