Investigating the Prevalent Side Effects of Depo - Provera Use among Adolescent Females at Bahn High School, Bahn City, Nimba County, Liberia

Edwin Yeliky Gonquoi[1]*, Yei Leyah Zeantoe[2] and Pauline P. Sehkpor[3]

[1]Department of Academic Affairs, Nimba University, Sanniquellie, Nimba County, Liberia.

[2]Associate Dean, College of Health Sciences, Nimba University, Sanniquellie, Nimba County, Liberia.

[3]College of Health Sciences, Nimba University, Sanniquellie, Nimba County, Liberia.

***Corresponding Author**

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ABSTRACT

This study investigated the side effects of Depo-Provera among female students of Bahn High School, Bahn City, Nimba County, Liberia, and examined their influence on students' health and academic engagement. The study was motivated by concerns that, although injectable contraceptives are widely used among adolescents, limited attention is often given to how their side effects affect daily functioning and learning outcomes. A descriptive cross-sectional survey design was employed, using structured, self-administered questionnaires to collect data from a respondent of 100 female students who had used or were using Depo-Provera. Descriptive statistical methods, including frequencies and percentages, were used to analyze the data with SPSS version 22. The findings revealed that Depo-Provera is widely utilized among students; however, its use is characterized by inadequate pre-administration counseling. The most commonly reported side effects were menstrual-related, particularly irregular bleeding and amenorrhea, along with weight gain. Although the majority of respondents perceived these effects as mild, they significantly influenced attitudes toward continued use. The study further established that side effects extend beyond physical symptoms to affect students' daily activities, contributing to reduced activity levels, stress, fatigue, and social withdrawal. While school attendance was relatively unaffected, notable challenges were reported in concentration and participation, indicating a negative impact on academic engagement. Academic performance outcomes were found to be mixed, suggesting a complex relationship between contraceptive use and learning outcomes. Additionally, support systems were largely health-sector-driven, with minimal involvement from schools, despite a strong demand among students for enhanced reproductive health education. The study concludes that while Depo-Provera remains an important contraceptive option for adolescents, insufficient counseling and limited school-based support constrain its effective use. It recommends strengthening pre-use counseling, reproductive health education in school curricula, and school-based support systems to improve students' health outcomes and academic engagement.

Keywords: Depo-Provera; Side Effects; Adolescent Females; Academic Engagement

INTRODUCTION

Depo-Provera, known medically as depot medroxyprogesterone acetate (DMPA), is one of the injectable contraceptives that many adolescent girls and young women in developing countries choose because it is effective, discreet, and requires administration only every three months (World Health Organization, 2020). For school girls who find it difficult to remember a daily pill regimen, this makes considerable practical sense. Given every three months, Depo-Provera prevents pregnancy primarily by suppressing ovulation through synthetic progesterone, thickening cervical mucus, and altering the uterine lining, features that have sustained its popularity

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across both wealthier and poorer countries (World Health Organization, 2020).

Despite its benefits, a number of studies have found that Depo-Provera use is accompanied by side effects, including menstrual irregularities, weight gain, headaches, mood changes, and reduced bone mineral density, particularly with prolonged use among adolescents whose bones are still developing (Westhoff et al., 2014; Curtis et al., 2016; Medic over Hospitals, 2024). Across sub-Saharan Africa, Depo-Provera remains among the most used contraceptive methods by young women because it is affordable, accessible, and unobtrusive (Guttmacher Institute, 2019), yet many adolescents receive little reproductive health education and are inadequately counseled before their injections, leaving them unprepared when side effects appear - a pattern that contributes to anxiety, dissatisfaction, and early discontinuation (Sedgh et al., 2016). Evidence from community-based distribution programs in Uganda similarly shows that weak follow-up and counseling continue to undermine informed, sustained use (World Health Organization, 2025).

In Liberia, teenage pregnancy remains a serious public health concern that drives school dropout, early marriage, and lost economic opportunity, prompting the Ministry of Health and its partners to expand access to sexual and reproductive health services for adolescents, with Depo-Provera as one of the primary methods offered through health centers and youth-friendly clinics (Ministry of Health Liberia, 2021). Girls from secondary schools, including those in Bahn City, Nimba County, are among the adolescents accessing these services. However, very little research documents what Liberian adolescents actually experience in terms of side effects; most existing reports focus on uptake statistics rather than lived experience, leaving health workers and policymakers without the evidence needed to shape counseling and service delivery around young users' actual needs - including growing concerns about how side effects may affect school attendance, concentration, participation, and general well-being (Ministry of Health Liberia, 2021).

Empirically, cross-sectional studies in sub-Saharan Africa report that menstrual irregularities, including amenorrhea and prolonged bleeding, are the leading causes of dissatisfaction and discontinuation among DMPA users, while adolescents are more likely than older women to raise concerns about weight gain, headaches, and mood changes (De Silva, et. al, 2024**;** Guttmacher Institute, 2021; World Health Organization, 2022;). These effects extend beyond the physical: research in East Africa links prolonged bleeding and fatigue to increased absenteeism, reduced classroom participation, and lower concentration (United Nations Children's Fund, 2020), while inadequate counseling and weak follow-up have been shown to worsen adolescents' ability to manage side effects (World Health Organization, 2025). Despite this evidence base, school-based, context-specific studies remain scarce in Liberia, underscoring the need for the present investigation at Bahn High School.

Statement of the Problem

Depo-Provera is a widely used long-acting injectable contraceptive, particularly among adolescents and young women in low- and middle-income countries, owing to its effectiveness, privacy, and three-month dosing interval (World Health Organization, 2020). In Liberia, it is central to national efforts to reduce teenage pregnancy and school dropout, resulting in increased use among school-going girls, including those at Bahn High School (Ministry of Health Liberia, 2021). Despite its effectiveness, concerns persist regarding side effects such as menstrual irregularities, weight gain, headaches, mood changes, fatigue, delayed return of fertility, and reduced bone mineral density, which may negatively affect users' physical health, emotional well-being, and continuation rates (Westhoff et al., 2014; Curtis et al., 2016; Medic over Hospitals, 2024). Inadequate reproductive health education and poor pre-injection counseling often leave adolescents unprepared, resulting in anxiety, poor management of symptoms, and early discontinuation (Guttmacher Institute, 2019; Sedgh et al., 2016; World Health Organization, 2025). Yet there remains a critical lack of localized, school-based research on how Depo-Provera side effects affect students' academic experiences in semi-urban Liberian settings such as Bahn City, where access to comprehensive reproductive health information is limited. This gap restricts the design of effective interventions and makes context-specific evidence essential.

Purpose and Objectives of the Study

This study sought to investigate the side effects of Depo-Provera among female students of Bahn High School

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and their influence on health and academic engagement. Specifically, the study sought to (i) identify the common side effects experienced by female students of Bahn High School who use Depo-Provera, and (ii) examine the influence of Depo-Provera-related side effects on students' daily activities and academic engagement.

Research Questions

1. What are the common side effects experienced by female students of Bahn High School who use Depo-Provera?
2. How do the side effects of Depo-Provera influence the daily lives and academic engagement of female students at Bahn High School?

Theoretical Framework

This study is guided by the Health Belief Model (HBM) (Skinner, Tiro, & Champion, 2015), which explains health-related behavior as a function of perceived susceptibility, perceived severity, perceived benefits, perceived barriers, and cues to action. Applied here, adolescents' willingness to continue or discontinue Depo-Provera is shaped less by the clinical severity of side effects than by how those effects are perceived and by whether adequate counseling (a cue to action) precedes use. The model provides a useful lens for interpreting why side effects rated as "mild" by most respondents nonetheless prompted many to consider discontinuation.

METHOD

Study Design

The study employed a descriptive cross-sectional survey design. This design is appropriate for quantitative research relying on questionnaires to collect data from a large number of respondents within a defined time frame.

Study Area

The study was conducted at Bahn High School, a government-owned secondary institution in Bahn City, Nimba County, Liberia. The school enrolls over three hundred students drawn from Bahn City and surrounding communities and is served by approximately twenty educators (Personal Interview, 2026). Given increasing adolescent access to reproductive health services, including Depo-Provera, in the area, Bahn High School provided a relevant and practical setting for examining students' experiences with contraceptive use and its influence on daily life and academic engagement.

Population and Sample

The study population comprised of 182 female students aged 15 - 19 enrolled at Bahn High School who had used or were using Depo-Provera. Sample size was determined using Adam's (2020) formula for finite populations, yielding a minimum requirement of 125 respondents. Purposive sampling was applied against explicit inclusion and exclusion criteria: Students who had never used Depo-Provera were outside the specified age range, or students who were unwilling to consent were excluded. Of the sampled respondents, 100 confirmed active or prior use of Depo-Provera and form the analytic sample reported.

Instrumentation and Data Collection

A self-developed, structured questionnaire was the data collection instrument, comprising sections on demographic characteristics, Depo-Provera use history, common side effects, and their influence on daily activities and academic engagement. The instrument was pilot-tested on a small group prior to full administration to ensure clarity and reliability. On the day of data collection, questionnaires were self-administered in a classroom setting under the researchers' supervision, with confidentiality maintained throughout.

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Data Analysis

Data were coded, entered, and cleaned in SPSS version 22. Descriptive statistics - frequencies and percentages - were used to characterize the sample and summarize reported side effects, and cross-tabulations were used to explore relationships between demographic variables and reported outcomes.

Ethical Considerations

Ethical approval was obtained from the relevant institutional authorities prior to data collection. Participation was voluntary and based on informed consent, with respondents assured of confidentiality and anonymity and informed of their right to withdraw at any point without consequence. Sensitive questions were administered with care to minimize discomfort or distress.

RESULTS AND DISCUSSION

This section presents the study findings and discusses them in relation to existing empirical and theoretical literature, beginning with the demographic profile of respondents and proceeding to the study's two central variables: the side effects experienced and their influence on daily activities and academic engagement.

Demographic Characteristics of Respondents

Table 1 Demographic and Depo-Provera Use Characteristics of Respondents

Variable	Category	f (%)
Age of Respondents	15 - 17 years	21 (21)
	18 - 20 years	31 (31)
	21 - 23 years	29 (29)
	24 - 25 years	19 (19)
Grade Level	Grade 10	38 (38)
	Grade 11	27 (27)
	Grade 12	35 (35)
Religion	Christian	80 (80)
	Muslim	12 (12)
	Other	8 (8)
Living Arrangement	With parents	46 (46)
	With relatives	17 (17)
	Alone	22 (22)
	With guardian	15 (15)
Ever used Depo-Provera	Yes	80 (80)
	No	20 (20)
Duration of Use	3 - 6 months	26 (26)
	7 - 12 months	38 (38)
	1 - 2 years	22 (22)
	2 years and above	14 (14)
Source of Injection	Government facility	68 (68)
	Private facility	11 (11)
	Pharmacy	21 (21)
Pre-injection side-effect counseling	Yes	28 (28)
	No	72 (72)

Source: Fieldwork (2026)

Respondents were predominantly late-adolescent to early-youth, fairly distributed across senior secondary grade levels, and overwhelmingly Christian. Nearly half lived with parents, with the remainder distributed across

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relatives, guardians, and independent living - a pattern with implications for the level of parental supervision over adolescents' reproductive health decisions. A substantial majority reported having used Depo-Provera, sourced predominantly from government health facilities, consistent with the central role public institutions play in adolescent reproductive health service delivery. Most notably, 72% of respondents reported receiving no explanation of possible side effects prior to injection, pointing to a systemic gap in pre-administration counseling and informed consent that carries implications for how side effects are subsequently experienced and interpreted.

Common Side Effects of Depo-Provera

Table 2 Common Side Effects of Depo-Provera Among Respondents

Variable	Category	f (%)
Side effects experienced	Irregular bleeding	46 (46)
	Amenorrhea	18 (18)
	Prolonged bleeding	6 (6)
	Weight gain	22 (22)
	Headache	2 (2)
	Abdominal pain	5 (5)
	Breast tenderness	1 (1)
Perceived severity	Mild	87 (87)
	Moderate	7 (7)
	Severe	6 (6)
Considered stopping due to side effects	Yes	63 (63)
	No	37 (37)

Source: Fieldwork (2026)

Menstrual-related changes - particularly irregular bleeding and amenorrhea - emerged as the most commonly reported side effects, followed by weight gain, while abdominal pain, headache, and breast tenderness were reported far less frequently. The overwhelming majority of respondents characterized their side effects as mild, yet 63% indicated that these effects had nonetheless led them to consider discontinuing the method, revealing a critical dynamic in which perceived tolerability does not translate into unqualified acceptance.

These findings are strongly consistent with existing literature. Studies by Kaunitz (2017) and Muthoni and Kabiru (2019) similarly identify menstrual disturbance as the most frequently reported side effect and a leading cause of discontinuation among adolescent users, a pattern explained biologically by DMPA’s suppression of ovulation and alteration of the endometrial lining (Sivin, 2020; World Health Organization, 2020).

The prominence of weight gain likewise mirrors patterns documented elsewhere, where hormonal contraceptives are understood to influence appetite and fat distribution (Kaunitz, 2017). The comparatively low reporting of headache, abdominal pain, and breast tenderness may reflect underreporting or a tendency for students to notice and report more visible, disruptive changes such as menstrual irregularity over subtler symptoms.

The finding that most side effects are perceived as mild aligns with World Health Organization (2022) guidance that DMPA side effects, while common, are rarely medically severe. However, the accompanying finding that many respondents nonetheless considered discontinuation supports the argument advanced by Muthoni and Kabiru (2019) that adolescents' perceptions of side effects - rather than clinical severity per se - drive continuation decisions.

Read through the Health Belief Model, this illustrates the operation of perceived barriers: even non-severe effects can be interpreted as disruptive, particularly absent adequate counseling. This connects directly to the counseling gap identified in Table 1, where the majority of respondents received no explanation of possible side effects before their injection, increasing the likelihood that subsequent symptoms would be perceived negatively.

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Influence of Side Effects on Daily Activities and Academic Engagement

Table 3 Influence of Depo-Provera–Related Side Effects on Students' Daily Activities and Academic Engagement

Variable	Category	f (%)
Side effects affected daily activities	Yes	65 (65.0)
	No	35 (35.0)
Nature of disruption (if yes)	Reduced activity	42 (42.0)
	Fatigue	8 (8.0)
	Stress	30 (30.0)
	Social withdrawal	20 (20.0)
Sought medical help for side effects	Yes	79 (79.0)
	No	21 (21.0)
Side effects affected school attendance	Yes	35 (35.0)
	No	65 (65.0)
Side effects affected concentration in class	Yes	42 (42.0)
	No	58 (58.0)
Side effects affected academic participation	Yes	33 (33.0)
	No	67 (67.0)
Change in academic performance	Improved	60 (60.0)
	No change	13 (13.0)
	Declined	27 (27.0)
Source of counseling/support	Health workers	42 (42.0)
	Teachers	5 (5.0)
	Parents	17 (17.0)
	Friends	28 (28.0)
	None	8 (8.0)
More reproductive health education needed in school	Yes	100 (100.0)
	No	0 (0.0)

Source: Fieldwork (2026)

A clear majority of respondents (65%) perceived that side effects interfered with their daily activities, most commonly through reduced activity levels and stress, with fatigue and social withdrawal also reported. Health-seeking behavior was relatively strong, with 79% consulting medical personnel about their symptoms. Academically, while school attendance was comparatively unaffected, meaningful proportions of respondents reported reduced concentration (42%) and participation (33%) in class, and performance outcomes were mixed - 60% reported improvement, 27% reported decline, and 13% reported no change. Support for managing side effects was concentrated in the health sector, with teachers playing a minimal role, even as all respondents agreed that more reproductive health education is needed in schools.

These findings extend beyond physical symptoms in ways that align closely with prior research. The reported reductions in activity, stress, fatigue, and withdrawal echo findings by Sivin (2020) and the World Health Organization (2020) on the psychological as well as physical dimensions of hormonal side effects, while Kaunitz (2017) similarly links weight and menstrual changes to self-image and social withdrawal. The relatively high rate of health-seeking behavior observed here contrasts somewhat with reports of adolescents facing stigma and access barriers to reproductive health services in other Liberian contexts (Liberia Ministry of Health, 2021), and may reflect growing availability of youth-friendly care - though it could equally indicate that students seek help only once symptoms become difficult to manage rather than as a preventive measure.

The pattern in which concentration and participation are affected more than attendance is consistent with Muthoni and Kabiru (2019) and World Health Organization (2020) findings that menstrual discomfort and fatigue can erode classroom engagement even when physical presence is maintained - an important distinction, since reduced cognitive engagement can still undermine learning outcomes despite stable attendance figures. The mixed academic performance outcomes present a more complex picture: while much of the literature emphasizes the negative academic impact of contraceptive side effects, the improvement reported by a majority of respondents may reflect indirect benefits of contraceptive use, such as reduced anxiety about unintended pregnancy - consistent with the Health Belief Model's proposition that perceived benefits can offset perceived barriers.

Finally, the concentration of support within the health sector, with minimal teacher involvement, mirrors observations by the Liberia Ministry of Health (2021) that reproductive health guidance in Liberia remains largely confined to health facilities rather than integrated into schools - a gap that contrasts with global guidance favoring comprehensive, school-based sexuality education (World Health Organization, 2020). The unanimous student demand for more education on contraceptive side effects reinforces this point and reflects the Health Belief Model's emphasis on cues to action: better-informed students are better positioned to interpret and manage side effects rather than experience them as unexpected and destabilizing.

CONCLUSION

Depo-Provera remains a widely accepted contraceptive method among female students at Bahn High School, but its use is undermined by inadequate pre-administration counseling and insufficient dissemination of information about potential side effects. Although the side effects reported are largely mild in clinical terms, they carry significant psychosocial and behavioral implications, shaping students' daily functioning, perceptions, and decisions about continued use. The absence of integrated school-based reproductive health education and support systems limits students’ ability to understand, manage, and cope with these effects, with consequences for both well-being and academic engagement.

RECOMMENDATIONS

Based on the findings and conclusions, the study recommends the following:

1. Health service providers should prioritize comprehensive counseling prior to Depo-Provera administration, ensuring users are fully informed of potential side effects, expected physiological changes, and management strategies.

2. Educational authorities should incorporate structured, age-appropriate reproductive health education into school programs, with particular emphasis on contraceptive methods, side effects, and coping mechanisms, and should train teachers to support this initiative.

3. Schools should establish functional support structures, such as counseling units or health clubs, to give students accessible platforms for discussing reproductive health concerns and obtaining guidance.

Compliance with Ethical Standards

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Disclosure of conflict of interest

No conflict of interest is disclosed.

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