

Unintended pregnancies and associated factors among women in two districts of the Northern Cape, South Africa: What does this suggest about the family planning program?

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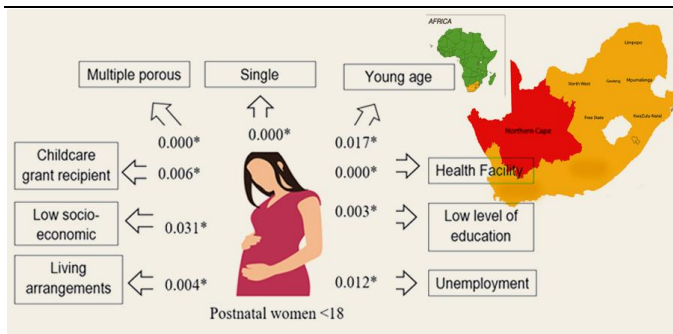
ABSTRACT

Despite the promotion of family planning services within South Africa, unintended pregnancies remain a significant public health concern with adverse consequences for maternal and child health outcomes. Previous studies have highlighted the burden of unintended pregnancies but are often limited by narrow geographic coverage signifying the need for population-level evidence from underrepresented provinces such as the Northern Cape. This paper reports on the prevalence of unintended pregnancies among 2527 women in the Northern Cape, South Africa. The system limitations identified in this study are inferred from population-level prevalence and socio-demographic patterns rather than from direct program or service assessments, and should therefore be interpreted with caution. A socio-demographic questionnaire was used to collect data and Stata-18 was used for data analysis ($p \leq 0.05$). The majority of the participants were single ($n=1777$; 70.45%) and unemployed ($n=2072$; 82.52%) with a mean age of 27. The majority (56.14%, $n=1413$) had unintended pregnancies. Unintended pregnancies were significantly associated with being young [OR: 1.2; CI: 1.03; 1.41], single [OR: 1.4; CI: 1.30; 1.58], unemployed [OR: 1.3; CI: 1.05; 1.61], multiparous [OR: 1.3; CI: 1.01; 1.62] and having a household income below R 500 [OR: 1.1; CI: 1.01; 1.12]. Whereas having a tertiary education [OR: 1.4; 95 % CI: 1.08; 1.51] and living alone [OR: 1.2; 95 % CI: 1.12; 1.92] was associated with lesser odds of having an unintended pregnancy. The high prevalence of unintended pregnancies among young, single, unemployed, and low-income women underscores the need for urban and rural public health interventions that combine accessible reproductive health services, targeted education, community outreach, and strategies to enhance female autonomy and educational opportunities, addressing both individual and structural socio-economic barriers.

ABSTRAK

Masalah Meskipun layanan keluarga berencana telah dipromosikan di Afrika Selatan, kehamilan yang tidak diinginkan masih menjadi masalah kesehatan masyarakat yang signifikan dan berdampak buruk terhadap kesehatan ibu dan anak. Studi sebelumnya telah menyoroti beban kehamilan yang tidak diinginkan, tetapi sering kali terbatas pada cakupan geografis yang sempit, sehingga menunjukkan perlunya bukti berbasis populasi dari provinsi yang kurang terwakili, seperti Northern Cape. Artikel ini melaporkan prevalensi kehamilan yang tidak diinginkan pada 2.527 perempuan di Northern Cape, Afrika Selatan. Keterbatasan sistem yang diidentifikasi dalam studi ini disimpulkan dari prevalensi tingkat populasi dan pola sosio-demografis, bukan dari penilaian program atau layanan secara langsung, sehingga harus ditafsirkan dengan hati-hati. Kuesioner sosio-demografis digunakan untuk mengumpulkan data, dan Stata-18 digunakan untuk analisis data ($p \leq 0,05$). Mayoritas peserta berstatus lajang ($n=1.777$; 70,45%) dan menganggur ($n=2.072$; 82,52%), dengan usia rata-rata 27 tahun. Mayoritas peserta (56,14%, $n=1.413$) mengalami kehamilan yang tidak diinginkan. Kehamilan yang tidak diinginkan secara signifikan berhubungan dengan usia muda [OR: 1,2; CI: 1,03; 1,41], status lajang [OR: 1,4; CI: 1,30; 1,58], pengangguran [OR: 1,3; CI: 1,05; 1,61], multiparitas [OR: 1,3; CI: 1,01; 1,62], dan pendapatan rumah tangga di bawah R 500 [OR: 1,1; CI: 1,01; 1,12]. Sementara itu, pendidikan tinggi [OR: 1,4; 95% CI: 1,08; 1,51] dan tinggal sendiri [OR: 1,2; 95% CI: 1,12; 1,92] dikaitkan dengan kemungkinan yang lebih rendah untuk mengalami kehamilan yang tidak diinginkan. Tingginya prevalensi kehamilan yang tidak diinginkan di kalangan perempuan muda, lajang, menganggur, dan berpendapatan rendah menegaskan perlunya intervensi kesehatan masyarakat di wilayah perkotaan dan pedesaan yang menggabungkan layanan kesehatan reproduksi yang mudah diakses, pendidikan yang terarah, penjangkauan masyarakat, serta strategi untuk meningkatkan otonomi perempuan dan peluang pendidikan, dengan menangani hambatan sosio-ekonomi baik pada tingkat individu maupun struktural.

GRAPHICAL ABSTRACT



Keyword

contraception
family planning services
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unplanned

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INTRODUCTION

Despite available options for planned parenthood, high rates of unplanned pregnancies persist, especially in low-middle income countries. This is also accompanied by unsafe abortions and other adverse maternal and neonatal health outcomes, where they remain a public health concern. Although there has been a decline in unintended pregnancies globally over the past 3 decades, it is reported that 50 % of all pregnancies were unintended during 2015-2019. Low-resourced countries bear much of this burden due to high rates of unmet needs for family planning services, which result in higher rates of unintended pregnancies. Many low- and middle-income countries continue to struggle to achieve SDG 5.6, which seeks to guarantee universal access to sexual and reproductive health services and uphold reproductive rights. These challenges are often driven by limited healthcare infrastructure, socioeconomic inequalities, cultural barriers, and insufficient access to education and family planning services, all of which contribute to higher rates of unintended pregnancies and poorer maternal and child health outcomes. Unintended pregnancy rate in Sub-Saharan African is 9.1 % compared to 3.5 % in Europe and North America. Specifically in South Africa, unplanned pregnancies range from 12-74 % due to various determinants (Bearak et al., 2020; Mutinta, 2022; Sarder et al., 2021; Woldesenbet et al., 2021).

A variety of determinants such as lack of usage and access to sexual and reproductive health services, lack of awareness, early sexual debut, substance abuse, abortion history, parity as well as other socio-demographic, economic and clinical factors have been associated with unplanned pregnancies (Ayamolowo et al., 2024; Gelaw et al., 2023; Kgarose et al., 2023; Sarder et al., 2021; Seakamela et al., 2023; Teshale, 2022).

The consequences of unintended pregnancies include adverse maternal outcomes such as increased odds of maternal depression and anxiety, prenatal and postpartum health complications, interrupted education and career ventures. Moreover, adverse neonatal outcomes such as prematurity, low birth weight, sepsis and mortality, have also been associated with unintended pregnancies. Unwanted pregnancies create a cycle of generational poverty due to lower education and employment prospects that increase risk of poor socio-economic status. Strained mother-child relationships are part and parcel due to increased prevalence of child neglect and abuse which interferes with the natural mother-and-child bond. It is

therefore important to understand the determinants of this phenomenon, which can be used to enhance desired maternal and neonatal outcomes (Dehingia et al., 2020; Eftekhariyazdi et al., 2021; Gharaee & Baradaran, 2020; Islam, 2024; Lundsberg et al., 2020; Mbongwa et al., 2024; Ndagijimana & Ugiriwabo, 2023; Nelson et al., 2022; Niemeyer Hultstrand et al., 2021; Ticona et al., 2024).

Although the South African government has increased efforts to provide sexual and reproductive health services to all, unplanned pregnancy rates remain high in the country (Baloyi et al., 2023; Woldesenbet et al., 2021), which raises questions regarding the appropriateness and effectiveness of the family planning program in the country. Beyond measuring prevalence, it is important to identify factors associated with unplanned pregnancies to inform service delivery. This study aimed to determine the prevalence and associated factors of unplanned pregnancy among postnatal women in two districts of the Northern Cape. By providing sub-district level data and identifying locally relevant determinants, the study addresses a critical data gap and offers insights to guide targeted interventions and local government planning.

METHODS

Study design

A quantitative cross-sectional study design, with the use of a researcher-administered questionnaire was used. The Northern Cape is the most sparsely populated province in South Africa, with a population of 1,355,629, despite being the biggest in size. The study took place in 9 Primary Healthcare (PHC) facilities from two districts (i.e. Frances Baard and John Taolo Gaetsewe) of the Northern Cape province in South Africa. The Northern Cape consists of 5 districts, namely, Namakwa, Pixley ka Seme, ZF Mgacawu, John Taolo Gaetsewe and Frances Baard. The province has approximately 135 PHC facilities and for the purposes of this study, 5 facilities were chosen from John Taolo Gaetsewe and 4 from Frances Baard.

Study population and sampling

The target population was postnatal women who had given birth to a live infant who was 12 months old or younger at the time of data collection

The healthcare facilities were stratified by district and facilities that had a high intake of postnatal women were purposively sampled with the help of staff from the healthcare facilities. In the morning

before the appointments, the selected field worker in each healthcare facility would be provided to address the group of women to request for participation, as well as explain the objectives and aims of the study. Subsequently, women who displayed interest in participating were selected at random for participation in the selected healthcare facilities. Although scientifically sound, this sampling strategy presents certain limitations. Selecting facilities with high postnatal attendance may have resulted in a sample that does not fully reflect women attending lower-volume or less accessible facilities, thereby limiting the broader generalizability of the findings. Furthermore, recruiting participants within healthcare settings may have disproportionately included women who are more accustomed to using health services, who may differ from those with limited or irregular access. The reliance on voluntary interest prior to random selection may also have introduced participation bias, as women who were more confident, available, or engaged were more likely to be included. These factors suggest that the sample may not comprehensively represent the full spectrum of postnatal women in the study area.

Sample size determination

The Raosoft sample size calculator was used to estimate a sample size of 377, using a 5 % margin of error, a confidence interval of 95 % and a distribution of 50 % based on an estimated population of 25 000 mothers who give birth per year in the Northern Cape ([Statistics South Africa, 2024](#)). Although the calculated minimum sample size was 377, recruitment continued until a total of 2,517 participants were enrolled. This was done to maximize statistical power, allow for more precise estimates, and ensure adequate representation across districts and subgroups. The larger sample also reduced the impact of missing or incomplete data and strengthened the robustness and reliability of the findings.

Data collection tool

A researcher-developed questionnaire consisting of a socio-demographic section in which participants were asked about their personal, social, economic and clinical information was used. The tool was then piloted in the different facilities prior to the commencement of the actual study. The piloting phase took place after the field workers from each facility was trained. Training on the use of the tool as well as ethical principles was done by two of the principal investigators. Thus, the piloting phase was used to

assess the clarity of the tool and where necessary, changes were made to ensure better use.

Data collection

The ethical clearance certificate, along with the provincial and district permission letters were used to negotiate for permission with the managers of the healthcare facilities. Upon receiving permission, participants were approached while waiting for health care services and those who were interested were included in the study. The data collection took place over a period of 6 months, from May 2023 to November 2023.

Data analysis

Raw data was captured, cleaned and coded using Excel and exported to STATA-18 (Stata Corporation, College Station, TX, USA) for analysis. Descriptive analysis was expressed using means and standard deviations for numerical data and percentages and proportions for socio-demographic data. The prevalence of unplanned pregnancy was determined by the responses given by the participants. Subsequently, using a p-value of 0.05 and confidence interval of 95 %, bivariate and multivariate analysis ensued using Pearson chi-square tests of association and binary multivariate logistic regression to determine which factors were significantly associated.

Ethical Considerations

This study was approved by the Sefako Makgatho Health Science University (SMUREC/H/62/2019:IR). The principles of informed consent, privacy, confidentiality and anonymity was upheld at all times for all participants.

RESULTS

Profile of the healthcare facilities

The total sample consisted of 2517 postnatal women, with 67.19 % (n=1698) from John Taolo district and 32.18% (n=829) from Francis Baard district in 9 healthcare facilities. Gateway (n=608; 24.06%), Maruping (n=390; 15.45%) and Churchill (n=293; 11.59%) clinics had the highest number of participants. Further details are provided in [Table 1](#).

Socio-demographic characteristics of participants

The largest proportion of the sample was between the ages of 24-34 (n=1141; 45.15%), with a mean age of 27.82. Approximately 70.30 % (n=1775) of the participants were single and 80.52% (n=2075) were unemployed. The majority were living with their

Table 1*Profile of the healthcare facilities*

Facilities	Frequency	Percentage
District		
Francis Baard	829	32.81
John Taolo Gaetsewe	1698	67.19
Facility Name		
Churchill	293	11.59
Gateway	608	24.06
Jan Kemp CHC	167	6.61
Jerry Botha	283	11.21
Kuruman Clinic	198	7.84
Maruping clinic	390	15.45
Pampierstad CHC	205	8.12
Seeding clinic	208	8.24
Valspaan PHC	173	6.85

families (n=2118; 84.34) and were recipients of the government child support grants (n=1184; 75.06%). More details on the profile of the participants are provided in [Table 2](#).

Prevalence of unintended pregnancies

Unintended pregnancy was assessed using a single self-reported item. Participants were asked, “Did you plan this pregnancy?” with response options of yes or no. This measure did not distinguish between mistimed and unwanted pregnancies; therefore, all pregnancies reported as not planned were classified as unintended. The prevalence of unintended pregnancies was 56.14 % (n=1413).

Factors associated with unintended pregnancies

All socio-demographic factors such age (p=0.000), marital status (p=0.000), employment status (p=0.000), highest level of education (p=0.000), household income (p=0.000), parity (p=0.000) and whether the participant was a recipient of a childcare grant (p=0.000) were significant during bivariate analysis, using a confidence interval of 95 % and p-value of 0.05 (see [Table 3](#)).

All the socio-demographic factors remained significant (CI: 95 %; $p \leq 0.05$) except for home language. Single [OR: 1.4; CI: 1.30; 1.58] women, who lived with their families [OR: 1.4; CI: 1.12; 1.92] had 1.4 greater odds of unintended pregnancies. Additionally, those who were unemployed [OR: 1.3; CI: 1.05; 1.61] and currently receiving a childcare grant [OR: 1.3; CI: 1.09; 1.66] were 1.3 times more likely to report an unplanned pregnancy. Parity [OR: 1.3; CI: 1.01; 1.62], age [OR: 1.2; CI: 1.03; 1.41], household income [OR: 1.1; CI: 1.01; 1.12] and level of education [OR: 1.2; CI: 1.09; 1.51] also remained significant during logistic regression (see [Table 4](#)).

DISCUSSION

The sample consisted largely of single, unemployed mothers who were under the age of 25. This socio-demographic profile mirrors other studies conducted in the country which demonstrate that a majority of women experiencing unintended pregnancies are young, unmarried and have a low socio-economic standing. The current study also found that most women had an income of R 500 or less, had a secondary school education and were recipients of childcare grants. It is worth noting however, that although some odds ratios (ie. household income (OR = 1.069)) are close to 1.0, these small differences can matter at the population level, especially considering the large sample size in this study. From a program perspective, these findings can help identify groups—such as low-income women—who may benefit from targeted interventions, like better access to contraception, counselling, and community education. In this way, even modest associations can inform real-world planning and improve reproductive health outcomes. Low socio-economic status has been linked to high rates of unmet need of sexual and reproductive services thus placing women coming from underprivileged backgrounds at a heightened risk for unplanned, mistimed or unwanted pregnancies. While the journey of pregnancy is considered a sacred and beautiful journey to undertake, the reality of having a pregnancy at the wrong time or under the wrong circumstances can be stressful and is a risk factor for ill mental health. This not only negatively affects the woman but also has adverse effects on the child, thus compromising both maternal and neonatal health ([Matthay et al., 2021](#); [Nelson et al., 2022](#); [Schonewille et al., 2022](#)).

Table 2
Socio-demographic characteristics of participants

Factor	Frequency	Percentage
Age*		
<25	912	36.09
25-34	1141	45.15
>=35	474	18.76
Marital status (n=2525)		
Cohabiting	412	16.32
Married	320	12.67
Single	1775	70.3
Separated/Divorced	13	0.51
Widow	5	0.2
Home language (n=2519)		
Afrikaans	155	6.15
English	38	1.51
IsiNdebele	17	0.67
IsiXhosa	49	1.95
IsiZulu	6	0.24
Sepedi	2	0.08
Sesotho	35	1.39
Setswana	2180	86.54
Venda	1	0.04
Xitsonga	4	0.16
Other	32	1.27
Highest level of education (n=2518)		
No formal education	26	1.03
Primary school	882	35.03
High school	1510	59.97
Tertiary education	100	3.97
Employment status (n=2513)		
Employed	365	14.52
Self-employed	74	2.94
Unemployed	2074	82.53
Household income (n=2516)		
Don't know	275	10.93
>R500	706	28.06
R500-R1000	111	4.41
R1001-R2000	360	14.31
R2001-R5000	631	25.08
R5001-R8000	306	12.16
<R8000	127	5.05
Who do you live (n=2512)		
Alone	47	1.87
Family	2118	84.34
Other	347	13.81
Parity (n=2527)		
Nulliparity	2	0.8
Primiparity	784	31.02
Multiparity	1741	68.9
Grant Recipient (n=2510)		
No	613	24.42
Childcare grant	1884	75.06
Disability grant	13	0.52

Note: * Age have a mean value 27.82; SD 6.57; Min 18; Max 47

It was found that 56.14 % of pregnancies in the current study were unplanned. This rate is higher than the 45.2 % reported in Zambia but similar to the 58.8 % reported in Tshwane. A combination of clinical, religious and socio-economic determinants have been linked to unintended pregnancies and each setting may have its own set of factors that affect

differing rates. The current study demonstrated that socio-demographic factors were more significantly associated with unplanned pregnancies than clinical factors. For example, only parity was significantly associated with unplanned pregnancies. Similar to the findings from Sierra Leone and Nepal, it is expected that women who already have their desired number of

Table 3
Factors associated with unintended pregnancies

Factor	Frequency (%)	Planned pregnancy		Chi ²	p-value
		Planned	Unplanned		
Facility				207.0639	0.000*
Churchill	293(11.59)	140 (12.68)	151 (10.70)		
Gateway	608(24.06)	152 (13.77)	456 (32.32)		
Jan Kemp CHC	167(6.61)	44 (3.99)	123 (8.72)		
Jerry Botha	283(11.21)	137 (12.41)	143 (10.13)		
Kuruman Clinic	198 (7.84)	124 (11.23)	73 (5.17)		
Maruping clinic	390 (15.45)	226 (20.47)	161 (11.41)		
Pampierstad CHC	205 (8.12)	108 (9.78)	96 (6.80)		
Seoding clinic	204 (8.24)	119 (40.69)	91 (6.38)		
Valspaan PHC	173 (6.85)	55 (4.98)	118 (8.36)		
Age				67.4313	0.000*
<25	912 (36.09)	304(27.54)	605(42.82)		
25-34	1141 (45.15)	545(49.37)	590(41.76)		
>=35	474 (18.76)	255(23.10)	218(15.43)		
Marital status (n=2525)				214.4443	0.000*
Cohabiting	412 (16.32)	246(22.30)	162(11.48)		
Married	320 (12.67)	231(20.94)	86(6.09)		
Single	1775(70.30)	618(56.03)	1153(81.72)		
Separated/Divorced	13 (0.51)	4(0.36)	9(0.64)		
Widow	5 (0.20)	4(0.36)	1(0.07)		
Home language (n=2519)				46.6282	0.000*
Afrikaans	155 (6.15)	69(6.27)	86(6.11)		
English	38 (1.51)	28(2.55)	9(0.64)		
IsiNdebele	17 (0.67)	14(1.27)	2(0.14)		
IsiXhosa	49 (1.95)	22(2.00)	27(1.92)		
IsiZulu	6 (0.24)	3(0.27)	3(0.21)		
Sepedi	2 (0.08)	1(0.09)	0(0.0)		
Sesotho	35 (1.39)	16(1.45)	19(1.35)		
Setswana	2 180 (86.54)	919(83.55)	1253(88.99)		
Venda	1 (0.04)	1(0.09)	0(0.00)		
Xitsonga	4 (0.16)	3(0.27)	1(0.07)		
Other	32 (1.27)	24(2.18)	8(0.57)		
Highest level of education (n=2518)				32.351	0.000*
No formal education	26 (1.03)	14(1.28)	12(0.85)		
Primary school	882 (35.03)	367(33.15)	515(36.57)		
High school	1 510 (59.97)	651(59.29)	852(60.47)		
Tertiary education	100 (3.97)	69(6.28)	30(2.13)		
Employment status (n=2513)				73.3444	0.000*
Employed	365 (14.52)	227(20.67)	137(9.76)		
Self-employed	74 (2.94)	46(4.19)	28(1.99)		
Unemployed	2074 (82.53)	825(75.14)	1239(88.25)		
Household income (n=2516)				70.5528	0.000*
Don't know	275 (10.93)	111(10.13)	163(11.58)		
>R500	706 (28.06)	243(22.17)	461(32.74)		
R500-R1000	111 (4.41)	49(4.47)	62(4.40)		
R1001-R2000	360 (14.31)	157(14.32)	202(14.35)		
R2001-R5000	631 (25.08)	285(26.00)	344(24.43)		
R5001-R8000	306 (12.16)	187(17.06)	113(8.03)		
<R8000	127 (5.05)	64(5.84)	63(4.47)		
Who do you live (n=2512)				63.3014	0.000*
Alone	47 (1.87)	20(1.82)	27(1.92)		
Family	2118 (84.34)	859(78.23)	1251(89.17)		
Other	347 (13.81)	219(19.95)	125(8.91)		
Parity(n=2527)				53.6795	0.000*
Nulliparity	2 (0.8)	1(0.09)	1(0.07)		
Primiparity	784 (13.02)	259(23.46)	524(37.08)		
Multiparity	1741 (68.90)	844(76.45)	888(62.85)		
Childcare grant (n=2510)				19.8859	0.000*
No	664(26.54)	340(30.99)	324(23.06)		
Yes	1884(73.46)	757(69.01)	1081(76.94)		

Note: Pearson chi-square test of association; * significant with $p < 0.05$

Table 4
Logistic regression model

Factor	Odds ratio	Standard error	P-value	Confidence Interval
Facility	1.241205	0.0243241	0.000*	1.194435 1.289807
Age	1.205086	0.944085	0.017*	1.033555 1.405085
Home language	0.99899	0.219864	0.963	.9568137 1.043025
Highest level of education	1.283098	0.1080013	0.003*	1.087958 1.513239
Marital status	1.437106	0.708069	0.000*	1.304817 1.582807
Employment status	1.304835	0.1388845	0.012*	1.059144 1.607519
Who do you live with	1.47227	0.200146	0.004*	1.12789 1.9217965
Household income	1.06992	0.291505	0.031*	1.005369 1.119692
Child care grant	1.343415	0.1437515	0.006*	1.08925 1.656886
Parity	1.277497	0.1536257	0.000*	1.009249 1.617042

Note: Binary logistic regression; Std. Err= Standard Error; p < 0.05 *; Conf.Interval= 95 % confidence interval

children, are less likely to use family planning methods thus having a low usage of contraceptives and ultimately an increased risk of unplanned pregnancies. On the other hand, age, marital status, living arrangements and highest level of education were all significantly associated with unintended pregnancies. To illustrate, greater odds of unplanned pregnancies were observed among unmarried women who were younger than 25, as demonstrated in other studies (Baloyi et al., 2023; Costa et al., 2021; Karki et al., 2024; Osborne et al., 2025; Sarder et al., 2021; Wollesenbet et al., 2021).

Younger women have higher rates of unmet need for contraception, especially in Africa which is an enabling factor for high rates of unwanted pregnancies among adolescents. Conversely, the current study findings were different to a study conducted by Baloyi and colleagues, which found higher rates of unplanned pregnancies among older, married women. A Zambian study concurred with these findings reporting greater odds of unplanned pregnancies among older women. The authors described that older women who desired to have more children were less likely to use contraception, placing them at a higher risk of unintended pregnancies. However, it can be counter-argued that younger women have less knowledge about sexual and reproductive health, making them more susceptible to poor decision making that may ultimately result in unplanned pregnancies (Sarder et al., 2021). This calls for greater coverage of awareness strategies that will encourage abstinence, responsible sexual behaviors and increased uptake of contraceptives.

Strengthening youth-friendly services—including confidential counseling, youth friendly healthcare times and targeted education—can empower young women to make informed

reproductive choices and reduce rates of unintended pregnancy. This argument may also offer an explanation on why the present study found that women who had a tertiary education were less likely to have unplanned pregnancies in comparison to those who had a secondary or primary school education. Higher education levels increase exposure to knowledge and empowers women to make informed decisions on their reproductive and sexual health. This suggests that interventions combining sexual health education with broader empowerment strategies may further enhance positive reproductive decision-making. Addressing these system-level challenges can improve the effectiveness of family planning programs across all age groups (Baloyi et al., 2023; Kareem et al., 2024; Kim et al., 2021; Sarder et al., 2021; Sikaluzwe et al., 2024).

Unintended pregnancies were also significantly associated with employment status, being a child-care grant recipient as well as household income. Women who were unemployed, were receiving child welfare and had a household income of R 500 or less, had a high prevalence of unplanned pregnancies, demonstrating the role played by socio-economic status, as evidenced in other studies. Low socio-economic status is a risk factor for unintended pregnancies and South Africa is plagued with socio-economic ills which are prevalent in the Sub-Saharan African region, presenting various health related inequalities. The unmet need for contraception is the highest among those of low-socio economic standing due to lack of access, as a result strengthening to odds of unintended pregnancies among this group. In the South African context, these vulnerabilities are often compounded by health-system constraints, including inconsistent contraceptive supply as well as limited method choice. For economically disadvantaged

women, such barriers may reduce continuity of contraceptive use or force reliance on less preferred methods, increasing the risk of unintended pregnancy. Strengthening supply chain reliability and expanding method mix availability, may help mitigate the impact of socio-economic disadvantage and improve the effectiveness of family planning programs (Baloyi et al., 2023; Bearak et al., 2020; Moges et al., 2020; Sarder et al., 2021).

These inequalities may also explain why specific healthcare facilities were significantly associated with unintended pregnancies in the present study with almost all healthcare facilities reporting higher rates of unplanned pregnancies than pregnancies that were planned, with the exception of three facilities. It is explained that equitable accessibility is not always feasible, with facilities located in rural areas often the most affected (Sarder et al., 2021; Seakamela et al., 2023).

Though family planning services have been generously rolled out within the country, many areas still lag behind with certain implications on coverage and utilization. Data from a household survey conducted in South Africa showed that the use of contraceptives in the Northern Cape was the lowest in the country, with a prevalence of 42% when compared with usage in other provinces. It has also been highlighted that the performance of family planning programs within different facilities differ due to the lack of resources, shortages of qualified health personnel to deliver services and other factors within the healthcare system that affect effective delivery of sexual and reproductive health services. Moreover, other challenges such as long waiting hours, restrictive operating hours as well as limited contraceptive methods may also contribute towards low utilization. Reducing waiting times and improving overall service efficiency can lower access barriers, particularly for women who face competing economic and caregiving demands. In addition, high-quality, client-centered counseling that is respectful, non-judgmental, and responsive to age, parity, and socio-economic context can improve understanding, satisfaction, and informed decision-making (Baloyi et al., 2023; Moges et al., 2020; Sarder et al., 2021).

This study has several limitations that should be considered when interpreting the findings. The cross-sectional design precludes causal inference between socio-demographic factors and unintended pregnancy. In addition, unintended pregnancy was assessed using a single self-reported item, which may be subject to recall and social desirability bias and did

not allow differentiation between mistimed and unwanted pregnancies. Recruitment was conducted within healthcare facilities, which may have limited the representativeness of the sample by excluding women with restricted access to health services. Furthermore, the study did not directly assess health system factors such as contraceptive stock availability, waiting times, provider attitudes, or the quality of family planning counseling. As a result, the influence of these service delivery constraints on unintended pregnancy could not be quantified. Despite these limitations, the study provides actionable evidence to inform programmatic planning. By identifying socio-demographic groups at higher risk of unintended pregnancy, the findings support targeted health system strengthening. The large sample size and sub-district-level analysis strengthen the relevance of the findings for local government planning and resource allocation.

CONCLUSIONS

The rate of unplanned pregnancies in this sample is concerning, mainly because the family planning program in the country is one of the longest running programs in the Sub-Saharan region. Thus, the expectation would be that this rate would be lower and would not have affected over half of the women in the sample. Moreover, the socio-economic risk factors among this sample is representative of the overall state of the country where unplanned pregnancies are prevalent among young, unemployed, unmarried women.

Similar to other developing countries, the findings highlight unintended pregnancy as a persistent public health challenge that is closely linked to socio-economic vulnerability, underscoring the need for reproductive health programs that address broader structural and economic barriers affecting sexual and reproductive health. The differential risk of unintended pregnancy across age and education groups points to the need for tailored interventions. Stakeholders should strengthen family planning services by ensuring reliable contraceptive supply, expanding method choice, and improving counselling quality through youth-friendly approaches. Youth-friendly services remain essential for younger women and integrating reproductive health education within community-based programs that promote abstinence and responsible sexual behaviors can further support informed decision-making and reduce unmet need. Therefore, community-based education initiatives and partnerships with educational institutions and local organizations can further improve awareness, promote

informed reproductive decision-making, and reduce unintended pregnancies. Future studies should make use of longitudinal designs and apply more detailed measures of pregnancy intention that distinguish mistimed from unwanted pregnancies. Moreover, including direct measures of health system factors (ie. contraceptive availability, method mix, waiting times, and counselling quality) would strengthen understanding of service-related barriers. Qualitative and community-based approaches are also recommended to capture women's lived experiences and improve representativeness.

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AUTHORS' CONTRIBUTIONS

Kebogile E. Mokwena contributed to the study design, conceptualisation of the study, manuscript review, and manuscript revision. Khomotso C. Maaga contributed to manuscript writing, participant enrolment, data collection, data acquisition, data analysis, fieldwork, manuscript review, and manuscript revision. Machaka Ravhengani contributed to manuscript writing, participant enrolment, data collection, data acquisition, data analysis, fieldwork, manuscript review, and manuscript revision. All authors read and approved the final version of the manuscript.

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COMPETING INTERESTS

The authors confirm that all of the text, figures, and tables in the submitted manuscript work are original work created by the authors and that there are no competing professional, financial, or personal interests from other parties.

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