Contraception use and unplanned pregnancies in a peri-urban area of eSwatini (Swaziland)

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A B S T R A C T

Background: Despite reported high levels of contraception use in eSwatini,
unplanned pregnancies are common. The aims of this study were to investigate prevalence and determinants of contraception use and unplanned pregnancies in a disadvantaged area in the Kingdom of eSwatini (Swaziland), and to investigate the association between unplanned pregnancies and antenatal care attendance.
Methods: This cross-sectional study was conducted at the non-governmental organization *Siphilile Maternal and Child Health* in Matsapha, a peri-urban industrial area, using data from pre-existing client records. The sample included clients (n = 1436) registered during pregnancy or up to three months postpartum between August 2014 and April 2016. Contraception use before conception and unplanned pregnancies were analysed with logistic regression to find associations with socio-demographic factors and health care utilization.
Results: In this population, 59% (n = 737) stated to have used contraception before becoming pregnant. Teenagers and first-time mothers were less likely to have used contraception. Seventy percent (789/1124) of the pregnancies were unplanned. Older women (≥ 35 years) were less likely while teenagers and multiparas (≥ 3 children) were more likely to have an unplanned pregnancy. Women with unplanned pregnancies were less likely to attend the recommended number of antenatal care visits compared to women with planned pregnancies.
Conclusion: The rate of unplanned pregnancies is high in this population, especially among teenagers. Family planning interventions need to focus on preconception care for teenagers to enable pregnancy planning including improved antenatal care attendance.

Introduction

The number of maternal deaths in developing countries has decreased by 40% over the past two decades due to increased contraceptive use [1]. It is estimated that a further 30% of maternal deaths could be avoided by fulfilling the unmet needs for family planning, mainly through reducing the number of unplanned pregnancies [1]. An unintended pregnancy is a pregnancy that occurred when no children were desired (unwanted) or that occurred earlier than desired (mistimed) [2]. 'Unplanned pregnancy' is a closely related concept describing pregnancies that occurred when contraception was used (contraceptive failure) or when a pregnancy was not desired, but no contraception was used.

Globally around 40% of all pregnancies are unintended [3]. Pregnancy planning is generally associated with age, marital status and parity and often with socioeconomic status and education [4]. Unintended pregnancies are associated with increased risk of unsafe abortions, maternal depression, babies with low birth weight, and preterm birth [5,6]. Unwanted births are more likely to be accompanied with inadequate prenatal care for mothers, the child being less likely to be breastfed, and more likely to die during the neonatal period [5,7].

Studies on pregnancy planning from developing countries are still lacking, and the negative impact of unplanned pregnancies is suggested to be greater in resource-poor settings [5,6]. The number of unplanned pregnancies can decrease by providing access to family planning, i.e. the conscious planning of when and how many children to have and the means to achieve this, e.g. use of contraception. Family planning has numerous positive effects on health and society, including improving women's health and reducing the maternal mortality ratio, improving child survival, reducing HIV transmission, and promoting gender equality [1]. Use of contraception is generally lower for teenagers (15–19 years), women living in rural areas, women with no or lower education, and poor women [8].

The Kingdom of eSwatini is a small country with several health challenges. The prevalence of HIV among adults aged 15 to 49 is the highest in the world and was 27% in 2016 [9]. Abortion laws are highly restrictive in the country, which puts women at risk of experiencing unsafe, rather than safe, abortions. The maternal mortality ratio also remains high at 389 per 100 000 live births (2015), and around one–fifth of all maternal deaths are related to Acquired Immunodeficiency Syndrome (AIDS) [10]. Use of contraception in eSwatini increased significantly from 22% in 1990 to 63% in 2010, more

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Table 1
Available variables from the client records that were entered into the database.

Variable	Explanation
Dependent variables	
Current pregnancy planned	If the current pregnancy was planned. Measured as yes or no
Use of modern contraception	Requested as 'were you on any family planning methods before becoming pregnant?' Modern methods defined as condom, pill, implant, injectable or intrauterine device (IUD). Traditional methods such as exclusive breastfeeding, abstinence, withdrawal, and other methods that were not specified as modern, were excluded. Only one method was captured per woman
Independent variables	
Mother's employment	At the time of enrolment in the organization
Mother's education	Highest education completed. The schooling system in eSwatini is divided into Primary 1–7 and thereafter Forms 1–5. Having never attended school or having attended any grade in Primary was considered as *low educational level*, while having attended Forms 1–5 or higher (secondary education or university) was considered *higher educational level*.
Mother's age	Divided into two categorical variables at either end of the reproductive age span: Teenagers (14–19 years) and Older mothers (≥ 35 years)
Mother's HIV-status	Positive or negative
Parity	Number of children (live and deceased children including stillbirths). Divided into two categorical variables: primiparas (never given birth before) and multiparas (three or more children)
Any deceased children	If the woman had had any children that had died, measured as yes or no
Full antenatal care (ANC) visits	Women were recommended to attend ANC at the clinic at least 4 times, which was considered *full* ANC visits

than in any other African country [11]. Recent studies also suggest that there is a high use of contraceptives in eSwatini [12–14], but unplanned pregnancies are still common [12,15]. Contraceptive use and unplanned pregnancies are influenced by several context-specific factors, including patterns of sexual behaviour and cultural values regarding sexuality, as well as religious and political beliefs [16]. This motivate studies from different settings. It is known that there is a high rate of unplanned pregnancies among first-order births and among teenagers in eSwatini [15], but few recent studies have investigated what other factors that affect use of contraception and unplanned pregnancies [12,13]. More knowledge is needed to identify the most vulnerable groups and prioritize interventions to improve family planning and reduce the number of unplanned pregnancies in this setting. The aims of this study were therefore to investigate prevalence and determinants of contraception use and unplanned pregnancies in a disadvantaged area of eSwatini, and to investigate the association between unplanned pregnancies and antenatal care attendance.

Methods

Setting

The study was performed within the organization *Siphilile Maternal and Child Health*, a locally registered non-governmental organization that was initiated in Matsapha in 2012. Matsapha is an industrial suburb outside Manzini, the largest city in eSwatini, with an approximate population of 35,000. Women living in the area face major social and health challenges, including high levels of unemployment and poor housing conditions [17]. The prevalence of HIV among mothers is high (41%), and the majority (63.5%) are single mothers [17].

The Siphilile program builds on an enhanced model for Community Health Workers, the Philani Mentor Mother Model that was first developed in South Africa [18]. Siphilile is a community-based organization that works to improve maternal and child health by recruiting women from the area and educating them to become Mentor Mothers (MMs). The MMs participate in a four-week training period, in which they are educated about basic maternal and child health issues such as family planning, HIV, and malnutrition. The MMs work four hours daily and walk from house to house to provide information, guidance, and support to mothers and mothers-to-be.

Data collection and variable selection

Women were enrolled in the Siphilile program during pregnancy and up to 3 months post-partum. Each MM was responsible for a certain geographical area, and the organization covered all parts of Matsapha. When identifying a client, the MMs approached the woman and

explained the objectives of the program. After consent, the client was visited by the MM regularly according to a set schedule. The MMs compile standardized records with information received from the clients during these home-visits. All data for this study were collected by the MMs at the second home visit during pregnancy except data on outcomes (pregnancy outcome and number of antenatal care visits) that were collected at the first home-visit post-partum. For clients that were enrolled post-partum, all data were collected on the first home-visit post-partum. Siphilile is registered by the Ministry of Health in eSwatini as a Non-Governmental Organization and is governed by the laws that cover these organizations.

All women enrolled in the Siphilile project had given their written consent to be part of the project. Women below 18 years of age were considered emancipated minors due to the fact that they were mothers and were thus included in the study. Permission to do so was given by parent or guardian, if available. Participation in the Siphilile project is entirely voluntary, and the client could choose to withdraw from the project at any time. Data from women who withdrew were not included in the analyses. The study was performed with respect for the integrity of all women involved and for the organization's code of conduct. Permission for data use was obtained from Siphilile's management. Only retrospective analysis of routine data collected as part of the Siphilile intervention was used. All data were coded before analyses, by only capturing the organization's identification number and no personal information. Data for this study were sourced from the organization's client records in April 2016. All clients enrolled by Mentor Mothers in randomly selected geographical areas between August 2014 and April 2016 were included. In case of multiple pregnancies during this time only data from the most recent pregnancy were collected. Women who were still pregnant, had an unknown pregnancy outcome, and who withdrew from the project were excluded in the final data set. Variables are described in Table 1.

Data analysis

Analyses were performed in IBM SPSS Statistics 20. The available variables were analysed and displayed in frequency tables to get an overview of the studied population. Cross-tabulations with group percentages were used to display group differences.

A two-step model of logistic regression analysis was used to identify relationships between dependent and independent variables. First, univariate logistic regression tests were performed to calculate crude Odds Ratios (OR). Independent variables with p-values of less than 0.20 in the univariate model were included in the multivariate analyses. A p-value of less than 0.05 was considered significant for group comparisons and the final logistic models.

Table 2

Characteristics of the study population (n = 1436).

Dependent variables	Frequency n (%)
Use of contraception	1250 (87)
Yes	737 (59)
No	513 (41)
Current pregnancy planned	1124 (78)
Yes	335 (30)
No	789 (70)
Independent variables	Frequency n (%)
Employment	1359 (95)
Employed	336 (25)
Unemployed	1023 (75)
Education	1237 (86)
Primary or lower	302 (24)
Secondary or higher	935 (76)
Age	1378 (96)
14–19	220 (16)
20–34	1064 (77)
≥ 35	94 (7)
HIV-status	1402 (98)
Negative	815 (58)
Positive	587 (42)
Parity	1355 (94)
Para 0	372 (28)
Para 1–2	680 (50)
Para ≥ 3	303 (22)
Deceased children	1317 (92)
None	1179 (90)
Any	138 (10)
Time of enrollment	1409 (98)
During pregnancy	964 (68)
≤ 3 months postpartum	445 (32)

Results

A total of 1436 records were available for analyses after exclusion according to set criteria. Background characteristics of the study population are displayed in Table 2. The mean age of women at the time of enrolment was 25 years, and the mean age of the women pregnant with their first child was 21 years. Twenty-seven percent of women were primiparas and the mean parity number was 1.5. Most were unemployed, and 42% (587/1402) had disclosed a positive HIV-status. Three out of four women had completed secondary school. The proportion of teenagers, aged 14–19, was 16% (220/1378). Ten percent of all women had had at least one child that had died.

Family planning

Of women who responded, 59% (737/1250) stated that they had used contraception before becoming pregnant. Most relied on injectables (22%), condoms (21%) and contraceptive pills (13%). Two percent used long-term methods, such as implants or intrauterine devices (IUDs). The most common method among HIV-positive women was injectables (27%), and there was no difference in condom use between them and their HIV-negative peers (21% for both groups). Among teenagers, only 35% stated that they had used contraception before becoming pregnant, making them 43% less likely to do so compared to the older women in this sample (AOR 0.57, CI 95% 0.39–0.84) (Table 3). Teenagers that had used contraception before becoming pregnant also reported a higher proportion of condom use (26%) compared to the overall contraception use. Educational level did not show any association to contraception use in this sample.

Unplanned pregnancies

A majority of clients, 70% (789/1124), had not planned their pregnancy. Among teenagers, 83% (146/176) of the pregnancies were unplanned, with a more than twofold risk compared to their older peers

(AOR 2.39, CI 95% 1.53–3.75) (Table 3). No association between pregnancy planning, HIV status, or socioeconomic factors such as employment and education was found in this sample (Table 3). There was also no difference (p = 0.55) in contraception use before pregnancy between planned and unplanned pregnancies.

Most women, 72% (815/1139), did not attend full antenatal care (ANC), defined as at least 4 visits during pregnancy. The proportion was 74% (487/657) for women with unplanned and 67% (188/281) for planned pregnancies (p = 0.02). Women with unplanned pregnancies were thus less likely to attend full ANC than women with planned pregnancies (AOR 0.68, 95% CI 0.49–0.95, adjusted for maternal age, HIV status, employment status and educational level).

Discussion

There is a high level of unplanned pregnancies in this vulnerable population. Considering the known association between unplanned pregnancies and adverse outcomes for mother and child, these findings thus call for comprehensive action to increase family planning in this environment. Furthermore, the findings emphasize the necessity to address the needs of teenagers, since as many as eight out of ten pregnant teenagers (83%) had a pregnancy that was unplanned and only one out of three teenagers had used contraception before becoming pregnant. This displays the multiple vulnerabilities of this group, with an increased risk of adverse pregnancy outcomes and of missing opportunities for education and employment [1,19]. These results on unplanned pregnancies among teenagers are in line with previous findings from eSwatini (78%), as well as from other African countries like Kenya and Ethiopia [14,20,21]. This despite the fact that almost all adolescent women in eSwatini know about at least one modern contraception method. Also, the proportion knowing where to access contraception, including condoms, is one of the highest in Africa [22]. It is common that teenagers are pressured into engaging in sexual intercourse and despite knowledge of contraception, they have difficulties in using it because of their social context and status [19]. Being sexually active as a teenager is often associated with social stigma and teenagers are often subjected to negative attitudes from providers [22]. Official statistics in eSwatini report that few (4%) of the teenage girls visiting a health facility during the last 12 months had been told about family planning [15]. In addition, women's rights in eSwatini are violated, as forced marriage, domestic violence and rape within marriage are not covered by current legislation [23]. One-third of Swazi girls have experienced sexual violence before the age of 18, which is associated with unwanted pregnancies [24]. Interventions on sexual health education and post-partum and post-abortion contraception before the age of 20 are strongly recommended by the WHO, but the overall evidence on how to prevent adolescent pregnancies is lacking [19].

Approximately six out of ten of women that responded reported that they had used contraception before becoming pregnant: a number similar to other studies from eSwatini [12,14]. The contraceptive method diversity was small, as shown in previous studies [12,14,15]. Further, it is dominated by methods with high rates of discontinuation and short-term methods with high rates of contraceptive failure [25,26]. Reporting contraceptive use does not presume correct and consistent use, which might explain why only 16% of all women reported contraceptive failure. Causes for discontinuation of contraceptives were not investigated in our study, but experiences from the MMs indicate that side-effects, inadequate contraceptive counselling, and lack of money were common causes. Another barrier for use of contraception is men being the decision-makers on reproductive health issues and six out of ten Swazi men believe that a woman who uses contraception may become promiscuous [15]. Increasing the range of contraceptives increase the chances of meeting a woman's reproductive needs [27] and switching from short-term hormonal methods to more long-term methods reduces the risk of unplanned pregnancies [28]. Also, home-visits with adequate contraceptive counselling involving men could be a

Table 3

Associations between women's characteristics and use of contraception before becoming pregnant and unplanned pregnancies in Matsapha, eSwatini.

Use of contraception	Yes n (%)	No n (%)	Univariate model OR (95%CI)	Multivariate model aOR (95%CI)
Employed	192 (66)	98 (34)	Ref	Ref
Unemployed	518 (56)	399 (44)	0.66 (0.50–0.87)[†]	0.85 (0.62–1.15)
Negative HIV-status	397 (56)	311 (44)	Ref	Ref
Positive HIV-status	330 (63)	190 (37)	1.36 (1.08–1.72)[†]	1.09 (0.84–1.43)
Higher educational level	483 (58)	349 (42)	Ref	
Low educational level	152 (56)	120 (44)	0.92 (0.69–1.21)	
Age ≥ 20 years	656 (64)	369 (36)	Ref	Ref
Teenager (14–19 years)	68 (35)	127 (65)	0.30 (0.22–0.42)[†]	0.57 (0.39–0.84)[*]
Age 14–34	675 (59)	473 (41)	Ref	Ref
Older women (≥ 35 years)	49 (68)	23 (32)	1.49 (0.90–2.48)[‡]	0.98 (0.55–1.76)
Para ≥ 1	605 (67)	294 (33)	Ref	Ref
Primipara (Para 0)	120 (37)	207 (63)	0.28 (0.22–0.37)[†]	0.35 (0.25–0.48)[†]
Para 0–2	540 (56)	420 (44)	Ref	Ref
Multipara (Para ≥ 3)	185 (70)	81 (30)	1.78 (1.33–2.38)[†]	1.05 (0.74–1.49)
No deceased children	616 (58)	450 (42)	Ref	Ref
Any deceased children	83 (66)	43 (34)	1.41 (0.96–2.08)[‡]	0.89 (0.58–1.37)
Unplanned pregnancies	**Yes n (%)**	**No n (%)**	**OR (95%CI)**	**aOR (95%CI)**
Employed	165 (64)	93 (36)	Ref	Ref
Unemployed	593 (72)	233 (28)	1.43 (1.07–1.93)[*]	1.25 (0.90–1.72)
Negative HIV-status	464 (72)	177 (28)	Ref	Ref
Positive HIV-status	308 (67)	153 (33)	0.77 (0.59 − Ref)[*]	0.77 (0.58–1.02)
Higher educational level	515 (69)	227 (31)	Ref	
Low educational level	182 (71)	74 (29)	1.08 (0.79–1.48)	
Age ≥ 20 years	628 (68)	293 (32)	Ref	Ref
Teenager (14–19 years)	146 (83)	30 (17)	2.27 (1.50–3.44)[†]	2.39 (1.53–3.75)[†]
Age 14–34	726 (71)	295 (29)	Ref	Ref
Older women (≥ 35 years)	48 (63)	28 (37)	0.70 (0.43–1.13)[‡]	0.52 (0.29–0.91)[*]
Para ≥ 1	563 (70)	242 (30)	Ref	
Para 0	215 (71)	86 (29)	1.07 (0.80–1.44)	
Para 0–2	590 (68)	272 (32)	Ref	Ref
Para ≥ 3	188 (77)	56 (23)	1.55 (1.11–2.16)[†]	2.41 (1.62–3.57)[†]
No deceased children	691 (71)	282 (29)	Ref	
Any deceased children	74 (65)	39 (35)	0.78 (0.51–1.17)	

[†] p < 0.01.
[*] p < 0.05.
[‡] p < 0.20.

feasible way to increase the use of contraception in this population.

We found no associations between use of contraception and pregnancy planning. It is known that intentions to avoid pregnancy are not perfectly associated with the use of contraception [16,27], and this pattern of high use of contraception before unplanned pregnancies is recognized from other studies from similar contexts. Among women attending postnatal care in eSwatini, 30% of the women with mistimed and 56% of the women with unwanted pregnancies reported that they had been using contraception when they became pregnant [12]. In a study from Ethiopia, unintended childbirth was higher among women who used contraceptives [21]. The levels of unintended pregnancy tend to rise rather than fall with modern birth control use, and the reasons for this apparent contradiction vary depending on context [27]. These examples illustrate the complexity of pregnancy intentions: it does not have be a conscious decision at the time of conception, rather a result of multiple influences that may change over time. Many women also lack the power to translate their intentions into practice because of gender inequalities [2].

HIV-status did not affect use of contraception or pregnancy planning. Previous research on contraception use among HIV-positive women has given inconsistent result [12,13], and it has been suggested that there is a difference in contraception use between clients receiving HIV care and treatment and those who do not receive such care [12]. This may be due to the regular contacts with healthcare providers that address family planning.

There was no difference in use of contraception or unplanned pregnancies in the different educational and employment groups in the multivariate analyses. This was unexpected, since contraception use is generally connected to financial status or employment and educational

level [15,20,21]. The level of education in this population was higher compared to eSwatini in general, where only 55% of girls attend secondary school [14], probably because it is a peri-urban area where a lot of women come looking for work. Our results on employment may be explained by the homogeneity of the group, as most women enrolled in Siphilile are poor irrespective of employment status [17].

When the study was conducted, full ANC attendance was defined as four visits. Consistent with previous reports, women with unplanned or unwanted pregnancies attend full ANC less often than those with planned or wanted pregnancies [5,29]. These results emphasize the importance of interventions to encourage women in this population to attend ANC.

Strengths and limitations

Pregnancy planning in this study was measured in a dichotomous manner, which simplifies this complex construct and can result in misclassification bias. Preferably, pregnancy planning should have been measured using scales such as the five-graded Swedish Pregnancy Planning Scale or the London Measure of Unplanned Pregnancy (LMUP) [30–32]. According to the LMUP, pregnancy planning is not only defined by contraceptive use or non-use, but also by timing and personal circumstances, intention to become pregnant, desire for motherhood, partner influences and pre-conceptual preparations [32]. Another limitation is that pregnancy planning was measured during pregnancy for some women, and up to 3 months postpartum for others, depending on when they were enrolled in the organization, and this entails recall bias. There might also have been bias when measuring intendedness as perceptions can change over time. However, an additional logistic

regression test was performed to compare pregnancy planning with enrolment during pregnancy or postpartum, and there was no difference between the groups (p = 0.24). The rate of unplanned pregnancies is also consistent with former studies as explained above, thereby suggesting that the measure has a strong external validity. This study has other limitations worth mentioning. The time span for contraceptive use before becoming pregnant was not defined which makes it an imprecise measurement. The records that contained the data were designed for health provision and not for research, thus it was not possible to add a validated instrument like LMUP. We investigated a limited number of determinants for contraception use and pregnancy planning. Relationship status and religion are two known determinants of contraceptive use that were not investigated. The MMs were not trained for data collection and a consistent approach when interviewing cannot be guaranteed. The data are based on self-reports and may be subject to recall bias, social desirability bias, e.g. reporting condom use because condoms are desired, or social stigma, e.g. non-disclosure of HIV-status. Even though most pregnant women in the area served by Siphilile were enrolled in the program, there is always an element of self-selection when it comes to care seeking behaviour, which can affect representativeness.

The study also has some strengths. The sample size is large, and this study is one of few from eSwatini, highlighting the needs of an extremely vulnerable population. It strengthens the evidence on where and on whom to focus efforts to improve women's health, and findings apply not only in eSwatini but also in similar settings globally. Further qualitative studies to better understand the dynamics of family planning in this setting are however needed.

Conclusion

Family planning is limited in this disadvantaged population in eSwatini and current use of contraception fails to prevent pregnancies, as most pregnancies are unplanned. Teenagers are disproportionally affected since they are less likely to use contraception and at substantial risk of experiencing unplanned pregnancies. Most women do not attend the recommended number of antenatal care visits, which is of immense importance since many women are HIV-positive. Family planning interventions need to focus on preconception care for teenagers to enable pregnancy planning including increased antenatal care attendance. Screening for reproductive intentions through a community-based model like the Mentor Mothers could be the first step in giving individualized family planning counselling.

Declarations

Ethical considerations

Formal ethical approval was not needed according to laws and regulations governing ethical approval at Uppsala University (SFS 2003:460) or according to regulations put forward by Ministry of Health, Swaziland (Scientifics and Ethics Guidelines for Awarding Research, MoH 2006).

Consent to publication

Permission for publication of data was obtained from Siphilile's management.

Competing interests

The first, second and third authors report no conflicts of interest. The last author was executive director of the organization at the time of data collection.

Appendix A. Supplementary material

Supplementary data to this article can be found online at https://doi.org/10.1016/j.srhc.2019.01.004.

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