

The relationship between prenatal self care and adverse birth outcomes in young women aged 16 to 24 years

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Abstract: Birth outcomes refer to the end result of a pregnancy. The purpose of this study was to examine the relationship between self care practices during pregnancy and adverse birth outcomes in young women aged 16 to 24 years at a provincial maternity hospital in Zimbabwe. A descriptive correlational design was used. Orem's Self Care theory was used to guide the study. Eighty pregnant women were selected using systematic random sampling and, data was collected using interviews from the 1 March - 31 April 2012. Permission to carry out the study was obtained from the provincial maternity hospital, the Department of Nursing Science and the Medical and Research Council of Zimbabwe. Findings revealed such adverse birth outcomes as prematurity (between 28-32 weeks) 10 (12.5%), still births, 3 (3.75%), low apgar 17 (21.2%) and low birth weight 16 (20%). Adverse birth outcomes in the mothers included high blood pressure 32 (40%), HIV infection 20 (25%) and post partum hemorrhage 7 (8.8%) Twenty-four (30%) participants had not booked for antenatal care, 1 (1.8%) booked for antenatal care at less than 12 weeks while only 1 (1.8%) disclosed her pregnancy at above 29 weeks' gestation. There was a moderate significant positive correlation between self care practices and adverse birth outcomes, $r=.340$. This meant that birth outcomes improved as self care practices increased. Significant R^2 . was .115 meaning self care practices explained 11.5% of the variance observed in birth outcomes. Midwives should advocate delay in sexual debut in young women to reduce adverse birth outcomes.

Keywords: adverse birth outcomes, prenatal self care, young women

I. Introduction

Ninety-five of births to young girls occur in the developing countries Zimbabwe included. [1] About 16 million young girls aged 16-24 give birth each year, roughly 11% of all births worldwide . [1] An analysis of survey data from 51 developing countries showed that almost 10% of the girls were mothers by age 16, with the highest rates in Sub-Saharan Africa. [1] The rate of pregnancies in young girls for the United States of America is 52, 1 per 1000. In some African countries, Zimbabwe included, cultural and religious practices like early and forced marriages contribute to youth pregnancy. Early onset of puberty combined with more peer pressure and less parental supervision result in youths being faced with making premature sexual decisions. [2]

Maternal conditions in adolescents cause 13% of all deaths and 23% of all disability adjusted life years. Delayed entry into prenatal care may be the result of late recognition of pregnancy. [3] Fear of stigma and discrimination may lead the pregnant young women to failing to disclose the pregnancy. Early entry into ante natal care (ANC) is important for early detection and treatment of possible complications. This includes blood pressure monitoring and weighing among many interventions. [4] Lack of prenatal care may subject the young woman to illness and death for both the mother and baby. [5] The birth outcomes the young woman's baby may succumb to are intra- uterine growth retardation, intra-uterine death, prematurity, low birth weight, low apgar and still birth. The woman is at risk for obstructed labour, eclampsia, obstetric fistula, placenta praevia, pregnancy induced hypertension, significant anaemia and a host of infections. Psychologically, the young woman who is pregnant may experience feelings of guilt, denial and anger. This, coupled with delay in seeking prenatal care, puts the life of both the pregnant youth and the unborn baby in danger.

In Zimbabwe, about 60% of young women marry by the time they are 18 years of age. [6] These mothers are about 2 years behind their age group in completing their education and they are likely to have a second child within 2 years after the first child. [6] According to a UNAIDS (2005) report, education plays an important role in predicting how well an individual is able to incorporate appropriate health education messages into their sexual behaviour. [6]

Youth reproductive behaviour has received considerable less attention in Zimbabwe than it deserves. [1] There little information to explain an association of prenatal self care practices during pregnancy and birth outcomes among young mothers. The purpose of this article is to determine the relationship between prenatal self care and adverse birth outcomes in young women aged 16 to 24 years. Orem's self care theory was used as a guiding framework for the study. A descriptive correlational study was conducted at a provincial maternity hospital in Zimbabwe. Interviews were conducted with women aged 16 to 24 years soliciting information about prenatal self care such as early booking for antenatal care, proper nutrition, treatment of sexually transmitted

infection and getting tested for HIV. Knowledge obtained from the study may assist youths to avoid practices that put young women at risk of adverse birth outcomes.

1.1 Purpose of the study

To determine the relationship between prenatal self care and adverse birth outcomes in young women aged 16 to 24 years at a provincial maternity hospital in Zimbabwe

1.2 Objectives of the study

- To assess prenatal self care in young women aged 16-24 years at a provincial maternity hospital in Zimbabwe.
- To evaluate birth outcomes in young women aged 16-24 years at a provincial maternity hospital in Zimbabwe.
- To determine the relationship between prenatal self care and birth outcomes in young women aged 16-24 years at a provincial maternity hospital in Zimbabwe.

II. Methodology

This section will describe the methods used in this study. Research design, setting, sample, data collection tools and techniques data collection plan and data analysis will be described

2.1 Research Design, Setting and Sample

A descriptive correlational non experimental study design was used to conduct the study. The population was selected using systematic random sampling. The study was conducted in the maternity department at the provincial hospital in Zimbabwe. The maternity department comprises of ante-natal clinic, labour ward, post-natal ward and special care baby unit. The study included participants aged 16 to 24 years at time of delivery and Shona or English speaking participants able to participate in a verbal interview. Excluded from the study were young mothers delivering at less than 28 weeks of gestation since one of the variables under study, still birth, is defined as delivery of a baby after 28 weeks of gestation showing no sign of life, and individuals who had participated in the pre-test of the instrument. There were 80 participants and sample size was calculated using a significance level of 0.05, effect size of 0.5 and power of 0.8 and an additional 15 subjects included to cater for attrition.

2.2 Data Collection Techniques and Tools

Data was collected using a structured interview which consisted of 3 sections namely Birth related outcomes questionnaire (BROQ), Self-Care Practices questionnaire (SCPQ) and Demographic Data Questionnaire (DDQ). Reliability of the instrument was ensured through a pretest and a computed Chronbach's alpha of 0.7. Content validity was ensured through the identification of items obtained from literature and the inclusion of these items into the instruments. Construct validity was ensured by conceptualizing all variables and translating the instrument to the vernacular.

2.3 Data Collection Plan

Permission was sought from the Medical Research Council of Zimbabwe (MRCZ), Department of Nursing science and from the provincial maternity hospital. A consent form detailing the participants' rights, the benefits and potential risks of the study was voluntarily signed by all participants.

2.3.1 Human Rights Consideration

Each participant was given full explanations of the research purpose and data collection procedures using a language the study participants understood. The participants were assured of no foreseeable risk to themselves and families as a result of taking part in the study and were advised that their participating in the study did not lead to direct personal gain but would assist in the management of and empowering adolescent women and their families. A private room was used for conducting interviews. Code numbers were used for anonymity. For confidentiality data was placed in a lockable bag kept by the investigator.

2.3.2 Data Collection Procedure

Data was collected through face to face interviews. Subjects were allocated code numbers which were written on each interview schedule and the pages of each were checked to ensure that all were present to ensure no missing data.

2.4 Data Analysis

Data was analysed using the Statistical Package for Social Sciences (SPSS.PC). Descriptive statistics was used to analyse demographic data, birth outcomes and self care practices using the mean, frequencies and percentages. Inferential statistics were used to analyse the relationship between self-care practices during pregnancy and birth outcomes

III. Results And Findings

Results of the study are presented in this section under demographic data, birth outcomes and self care practises in young women aged 16 to 24 years. The results of the relationship between self care practices and adverse birth outcomes are also presented.

3.1 Sample Demographic Characteristics

Table 1 is a summary of demographic characteristics. The 16 year age category was represented by four (5%) participants were aged 16 while 15 (18.8%) were aged 21. Thirty-eight 38 (47, 5%) participants were single, 33 (41.25%) were married, 8 (10%) were divorced and 1(1.25%) was widowed. Fifteen participants (18.8%) had reached up to tertiary level in their education. Fifty-seven (71.2%) participants had had two pregnancies and 23 (28.8%) had had three pregnancies.

Table 1 Demographic Characteristics (1). (N = 80)

Variable	Frequency	Percentage
Age in years		
16	4	5
17	4	5
18	8	10.0
19	9	11.2
20	17	21.2
21	15	18.8
22	6	7.5
23	7	8.8
24	10	12.5
Marital status		
Single	38	47.5
Married	33	41.2
Divorced	8	10.0
Widowed	1	1.2
Level of education		
None	0	0
Primary	25	31.2
Secondary	40	50.0
Tertiary	15	18.8
Number of pregnancies		
Two	57	71.2
Two and above	23	28.8
Number of children		
None	13	16.2
One	45	56.2
Two and above	22	27.5

3.2 Birth Outcomes

Table 2 is a summary of birth outcomes experienced with the current pregnancy. Some of the birth outcomes investigated were whether the woman gave birth to a live baby, the apgar score at 5 minutes, weight of the baby, amount of blood loss during delivery and whether treatment for lack of blood was needed after delivery.

Table 2 Birth Outcomes (N = 80)

Variable	Frequency	Percentage
Gestational Age at Delivery		
28 – 32 weeks	10	12.5
33 – 36 weeks	22	27.5
37 weeks and above	48	60.0
Alive at birth?		
Yes	77	96.25
No	3	3.75
Apgar Score at 5 minutes		
Less than 7	17	21.2

7 - 10	63	78.8
Birth Weight		
Less than 2500g	16	20.0
2500g and above	64	80.0
Blood lost during delivery		
Yes	7	8.8
No	73	91.2
Amount lost		
More than 500mls	7	8.8
Less than 500mls	73	91.2
Treatment for low blood		
Yes	39	48.8
No	41	51.2
Tiredness		
Yes	39	48.8
No	41	51.2
HIV/AIDS infections		
Yes	20	25.0
No	60	75.0
High blood pressure		
Yes	32	40.0
No	48	60.0
Treatment for high BP		
Yes	15	46.8
No	17	53.2

Table 3 displays total Birth Outcomes Scores. The maximum possible score was 15. A total score of 0-5 indicated poor birth outcomes, 6-11 indicated fair birth outcomes while 12 and above was indicative of good birth outcomes. The minimum total birth outcomes score for the sample was 4 and the maximum was 12. The mean score was 8.99, range was 8, mode was 9 and the standard deviation was 1.480.

Table 3 Total Birth Outcome Scores (N = 80).

Total Score	Frequency	Percentage
4	4	5.0
6	1	1.2
7	10	12.5
8	11	13.8
9	25	31.3
10	15	18.8
11	13	16.2
12	1	1.2

3.2 Self Care Practices During Pregnancy

Table 4 shows the distribution of participants according to certain self care practices during pregnancy. Some of the self care practices under investigation were when someone knew she was pregnant, when she booked for ANC, the first sign of pregnancy identified and disclosure of the pregnancy.

Table 4 Self Care Practices during Pregnancy (N = 80)

Variable	Frequency	Percentage
Gestational age at pregnancy awareness		
Less than 12 weeks	18	22.5
12 – 20 weeks	35	43.7
21 – 28 weeks	26	32.5
29 weeks and above	1	1.3
Pregnancy Sign		
Missed period	72	90.0
Pregnancy Test	5	6.2
Increase in abdominal size	3	3.8
Gestational age at pregnancy disclosure		
Less than 12 weeks	12	15.0
12 – 20 weeks	47	58.7
21 – 28 weeks	20	25.0
29 weeks and above	1	1.3
First disclosed to:		
Parents/ Guardian	2	2.5
Family member	9	11.2
Husband /Boyfriend	65	81.3
Friend	4	5.0

No one	0	0
ANC Booking Status		
Booked	56	70.0
Unbooked	24	30.0
Gestational Age at Booking		
Less than 12 weeks	1	1.8
12 – 20 weeks	13	23.2
21 – 28 weeks	25	44.6
29 weeks and above	17	30.4
Number of Prenatal Visits		
Once	10	17.9
Two	13	23.2
Three	8	14.3
Four and above	25	44.6

Table 5 is a continuation of self care practices during pregnancy and summarises data relating to appetite during pregnancy, feeds taken per day, and weight gain

Table 5 Self Care Practices During Pregnancy ii (n = 80)

Variable	Frequency	Percentage
Appetite during pregnancy		
Yes	61	76.2
No	19	23.8
Feeds per day		
Once	3	3.8
Twice	12	15.0
Thrice	34	42.4
Four and above	31	38.8
Advice on blood levels		
Yes	44	55.0
No	36	45.0
Supplements		
None	34	42.5
Iron	3	3.8
Folic Acid	1	1.2
Both Iron and Folic Acid	42	52.5
Weight gain during pregnancy		
Less than 5kg	25	31.2
5 – 9kg	49	61.3
10 – 12.5kg	6	7.5

Table 6 displays results regarding substance abuse and exposure to HIV during pregnancy.

Table 6 Substance Abuse and Exposure to HIV/AIDS (N = 80)

Variable	Frequency	Percentage
HIV testing		
Yes	52	65.0
No	28	35.0
Knowledge on HIV status		
Positive		
Negative	26	32.5
Commenced on PMTCT		
Yes	26	32.5
No		
STI during pregnancy		
Yes	19	73.0
No	7	27.0
Treated for STI		
Yes	27	33.8
No	53	66.2
Use of condoms		
Never used condoms	15	58.0
At times	12	42.0
All the time	51	63.8
	20	25.0
	9	11.2

Self Care Practices During Pregnancy Total Scores

Table 7 illustrates the total actual scores on self care practices during pregnancy. The minimum score for the sample was 14 while the maximum score was 30. The mean score was 24.32, the mode being 28, with a standard deviation of 3.561. The range was 16.

Table 7 Total Scores for Self Care Practices During Pregnancy (N = 80)

Total Score	Frequency	Percentage
Fourteen	4	1.2
Fifteen	1	1.2
Sixteen	1	1.2
Seventeen	0	0.0
Eighteen	2	2.5
Nineteen	4	5.0
Twenty	3	3.8
Twenty-one	3	3.8
Twenty-two	7	8.8
Twenty three	7	8.8
Twenty four	9	11.2
Twenty five	9	11.2
Twenty six	9	11.2
Twenty seven	6	7.5
Twenty eight	11	13.8
Twenty nine	4	5.0
Thirty	3	3.8

3.3 Self Care Practices During Pregnancy and Birth Outcomes

Table 8 illustrates the correlation matrix of the relationship. The correlation coefficient was .340 and significant (r = .340, p = < .001).

Table 8 3.3.1 Pearson’s Correlation Matrix of Self Care Practices during pregnancy (N = 80)

Variable	Y
	1.000
X	.340**
*P = < .05	**p = < .01
	***p = < .001

Y = Birth Outcomes

X = Self Care Practices during pregnancy

Regression Analysis

Table 9 below summarises the regression analysis. Significant R² was .115, expressed as a percentage, R² = 11.5%. The significant F test (F = 10.163, p = < .01) indicates a linear relationship and that the R² is significant. The unstandardized Regression Coefficient b (0.141 p < 0.001) represents a change in birth outcomes for every unit change in the self care practices.

Table 9 3.3.2 Regression Analysis of Birth Outcomes (N = 80)

Variable	B	SEB	Beta	Significant T
X	5.555	1.088	.340	5.106
Constant	.141	.044		3.188
	R ² = .115		F = 10.163	
*p = < .01		**p = < .01		***p = < .001

X = Self Care Practices During pregnancy

IV. Discussion

Findings of the study are presented in this section and they will be presented under the headings sample demographics, birth outcomes, self care practices during pregnancy and the relationship between self care practices and birth outcomes during pregnancy. Recommendations and limitations of the study will also be discussed.

4.1 Sample Demographics

Participants’ ages ranged from 16 to 24 years. This concurs with findings of a survey of 51 developing countries conducted by UNFPA (2011), which showed that a large percentage of girls were mothers by age 16. [1] A high number of the participants 33(41.25%) were married, confirming earlier reports of early marriages by Farber, (2003). [2] The fact that 57% (71.2%) had had two pregnancies and 23(28.8%) had two or

more pregnancies by age 24 further confirms early motherhood. Forty (50%) had reached secondary education, and 15(18.8%) had had tertiary education implying that the majority of participants had attained some higher level of education. This has implications for self care practices during pregnancy because education plays an important role in predicting how well an individual is able to incorporate health education messages into their sexual behaviour . [6] Education alone does not translate to change in sexual behaviour as there are many other factors leading to early marriages and early pregnancies such as forced marriages, inadequate parental supervision and peer pressure . [2] Twenty-two (27%) had two or more children and 13(16.2%) had no live children despite the findings that 22 (27%) had had two pregnancies. This may imply that some youths may have experienced adverse infant related outcomes such as abortions, prematurity, still birth, and fatalities preceded by low Apgar score and low birth weight, which ended fatal. The findings are supported by Townsend (2006) who acknowledged that in Sub-Saharan Africa infants born with these adverse birth outcomes may die in their first week or month and these are the major determinants of child survival. [7]

4.2 Birth Outcomes

The 32 (40%) premature deliveries, may be attributed to the high number of the participants, 39 (48.8%) who were aged 18 years and below. Biological immaturity leads to preterm deliveries, with adolescents aged less than 17 years being at increased risk of preterm delivery. [8]

Thirteen (30.7%) delivered still births which is very high but supports the finding by Santhya et al (2010) who reported that women marrying at less than 18 years were more at risk for miscarriages or still births than their older counterparts. [9] There is need therefore to advocate self empowering programs for the girl child to delay early child birth that places them at risk of these adverse outcomes. A fifth of the participants delivered low birth weight infants (< 2500g) while 64 (80.0%) had infants with birth weight of 2500g and above, probably because infants born to young mothers are generally at increased risk of low birth weight. [5] In this study 7(8.8%) of the participants lost more than 500millilitres of blood per vagina during delivery implying the risk of post-partum haemorrhage (PPH). Pilliteri (1999) cited that pregnant young women are more prone to PPH because if the woman's uterus is not yet fully developed, it becomes over-distended by pregnancy and does not contract as readily as an older woman's uterus leading to PPH. [10] This tends to create more serious problems for young women such as shock and anaemia. In this study 20% of the participants had suffered some infections related to HIV/AIDS during pregnancy. Globally,40% of HIV infections occur in youths and the prevalence rate of HIV infections among pregnant young mothers attending prenatal care in Zimbabwe is 13.1%. [1] This high rate may be due to lack of empowerment for the girl child and women in general and Midwifery has a role of health education to ensure women's empowerment to negotiate for safe sex and delay in marriage.

4.3 Self Care Practices During Pregnancy

Findings of this study do show that there are some negative self care practices in young pregnant women aged 16-24 years at a provincial maternity hospital in Zimbabwe. Despite the high rate of pregnancies in most African countries, Zimbabwe included, not all pregnant young women are aware of their pregnancies in the first trimester.

Thirty-five (43.8%) participants were aware of their pregnancy status at 12-20 weeks gestation while only 18 (22.5%) became aware of being pregnant at less than 12 weeks gestation. The fact that twenty-six (32.5%) knew that they were pregnant at above 21 weeks' gestation concurs with earlier literature that reported that the majority of adolescents may not recognise that they are pregnant due to lack of awareness that a missed period may indicate pregnancy. [11] Awareness of being pregnant and subsequent disclosure provide the basis for preventive and supportive care that promotes positive birth outcomes. The preventive and supportive care includes getting tested for HIV and other STIs, commencing ART when she is HIV positive, having investigations such as full blood count done and routine weighing to monitor weight gain. Early awareness of pregnancy might prompt a pregnant young woman to book early for antenatal care which might help to avert negative birth outcomes. [3] Fifty-six (70.0%) participants were booked for prenatal care while 24 (30%) were not. This implies that not every young woman who was aware of her pregnancy booked for antenatal care. This might mean that there are other factors that influence booking such as lack of user fees since prenatal and maternity care is not free in Zimbabwe. Adequate prenatal care is the pillar for safe motherhood and may reduce the burden of maternal and infant mortality. It is therefore imperative for Midwifery to advocate for accessibility of prenatal care by every pregnant woman regardless of age. It is therefore vital that education be given in schools on all the signs of pregnancy.

Some participants reported not adhering to some vital self care practices during pregnancy such as getting tested for HIV, getting advice on blood levels, taking prescribed medications only, avoiding alcohol, getting treated for STIs and always using condoms to prevent STIs during pregnancy. Twenty-eight (35%) participants did not go for HIV testing. These are most probably the young women had not for ANC because provider initiated testing and counseling for HIV is part of ANC in Zimbabwe. This further validates the need

for early awareness and booking for ANC because if the young woman tests HIV positive she commences ART that might avoid vertical transmission of HIV to the unborn baby and prevents rapid progression of the HIV infection in the pregnant mother. Half of the participants who were tested for HIV tested HIV, positive implying urgent interventions to avert vertical transmission of HIV to the baby. Becoming infected during pregnancy heightens the risk of transmitting the virus to the unborn baby. [1] In Zimbabwe, HIV prevalence is almost 3 times higher among youths and is fuelled by intergenerational sex. [1] Nineteen (73%) of the HIV positive women, had commenced the PMTCT programme. There is need therefore to follow up patients who test HIV positive to ensure that they have commenced ART to prevent adverse outcomes like congenital anomalies, low birth weight and high neonatal mortality due to HIV infection in the baby.

Though 27 (33.8%) participants suffered some STIs during their pregnancy, 51 (63.8%) participants never used condoms and only 9 (11.2%) participants always used condoms. Condoms prevent transmission of HIV and reinfection then ultimately might reduce the chances of vertical transmission. Consistent use of condoms might prevent transmission of STIs during pregnancy that might increase the chances of HIV transmission. There is need for advocacy by Midwives for consistent use of condoms during pregnancy. There is a need to treat all STIs during pregnancy and for advocacy for safe sex during pregnancy because repeated STIs are linked to many adverse birth related outcomes. [12] The results suggest various strategies for information dissemination to young pregnant women pertaining to condom use as a measure to curtail HIV transmission to the unborn babies. It is also important to note that whether condoms are used as a means of contraception or as protection from STIs, they are strongly associated with extra marital sex.

Taking unprescribed medications during pregnancy is discouraged because some drugs are teratogenic and they cause malformations and intra-uterine growth restriction. [4] Twenty-two (27.5%) participants used unprescribed medications during pregnancy. This could be due to non-booking or late booking by the pregnant young women which leads to the young women resorting to home remedies and over the counter drugs when they are ill. Fear of stigma and discrimination may lead the pregnant young women to failing to disclose the pregnancy (Phiri, 2010), therefore resorting to self remedies due to fear of the pregnancy being discovered. [3] Lack of awareness by the pregnant young woman may lead her to using unprescribed medications for such ailments as vomiting, headache and dizziness which are common during the first trimester of pregnancy. Early entry into ante natal care (ANC) is important for early detection and treatment of possible complications.

Eleven (13.8%) of the participants took alcohol during pregnancy and though most of them reported no prior use of alcohol, they developed a craving (pica) for alcohol during pregnancy. Though pica is a common phenomenon during pregnancy, taking alcohol during pregnancy should be discouraged because it may be detrimental to the infant.

4.4 Relationship Between Self Care Practices During Pregnancy and Birth Outcomes

There was a moderate positive correlation between self care practices during pregnancy and birth outcomes ($r = .340, p < .01$). this means that as self care practices during pregnancy improve in pregnant young women birth outcomes also improve. Regression analysis R^2 was.115 ($F = 10.163, p < .01$). This means that self care practices during pregnancy explain 11.5% of the variance observed in birth outcomes. Regression coefficient B (0.141, $p < 0.001$) represents a change in birth outcomes for a unit change in self care practices during pregnancy. Thus self care practices during pregnancy have a small relative positive influence on birth outcomes. This may mean that there are other factors that influence birth outcomes in pregnant young women. Pagnini (2006) cited that, the seemingly poorer birth outcomes of young mothers compared to their older counterparts appear to result not from their adverse socio-economic circumstances but maybe largely from other diverse related factors. [13] Midwives should strengthen health education programmes for good self care practices in pregnant young women. Further research is needed to explore other factors that influence birth outcomes in pregnant young women.

V. Conclusion

Pregnant young women are at risk of a number of adverse birth outcomes such as PPH, anaemia and hypertension in pregnancy. The unborn babies of these pregnant young women are also at risk of such adverse birth outcomes as intra-uterine growth retardation, low birth weight and low apgar scoring. Schools of Nursing and Midwifery should incorporate objectives into the curriculum aimed at developing skills and modifying behaviour related to supporting, educating, and empowering pregnant clients so that they practice self care and become active partners in reducing maternal and infant mortality. There is need for pre-service and periodic in-service training to appraise MCH/Midwifery practitioners of current trends in maternity care. Public awareness should be improved through health education stressing the importance of delaying sexual debut and benefits of early entry into prenatal care to reduce adverse birth outcomes, maternal, perinatal and infant mortality and morbidity. Male involvement is important for successful implementation of safer sexual practices such as increasing condom use to reduce vertical transmission of HIV/AIDS. Though the study identified links between

adverse birth outcomes and the self care practices in pregnant young women, its generalizability to the whole country could be limited by the fact that the study was conducted at a single urban site therefore, results may not be representative of the entire population. In addition self reporting and face to face interviews used to collect data could have introduced bias since participants may have been reporting what they felt the investigator wanted to hear.

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