ASSOCIATION BETWEEN PREVIOUS ABORTION AND THE SUBSEQUENT PREGNANCY OUTCOMES AMONG WOMEN WHO DELIVERED AT THE REGIONAL REFERRAL HOSPITALS IN DAR ES SALAAM.

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By

Judith Edward, MD.

A Dissertation Submitted in Partial Fulfilment of the Requirements for the Degree of Master of Medicine in Obstetrics and Gynaecology of the Muhimbili University of Health and Allied Sciences.

October, 2021

CERTIFICATION

The undersigned certifies that she has read and hereby recommends for examination of the dissertation entitled **"Association between previous abortion and the subsequent pregnancy outcomes among women who delivered at the regional referral hospitals in Dar es salaam.",** in partial fulfillment of the requirements for the degree of Master of Medicine in Obstetrics and Gynaecology of Muhimbili University of Health and Allied Sciences.

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Dr. Matilda Ngarina (Ph.D.)

(Supervisor)

_____

Date

DECLARATION AND COPYRIGHT

I, **Judith Edward**, declare that this **dissertation** is my original work and that it has not been presented and will not be presented to any other University for a similar or any other degree award.

Signature ……. Date……

ACKNOWLEDGEMENT

I would like to thank the Almighty God for His grace throughout my research work.

I would like to express my sincere gratitude to my supervisor Dr. Matilda Ngarina for her continuous support and guidance throughout the research period.

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Thanks to my husband, my beloved mother, siblings and family at large for giving me an extra push to reach new heights and for their prayers, sacrifices and support throughout my study period.

DEDICATION

I dedicate this work to my beloved husband Samwel and my children Melinda and Jonathan for their patience and tolerance on my temporary absence from home to fulfill this work.

ABSTRACT

Background: Globally, women experience an estimated rate of 28 million spontaneous abortions and 2.6 million stillbirths. Abortion or spontaneous pregnancy loss before 28 completed weeks of gestation is estimated to affect 10–15% of pregnancies.
In Tanzania, the rate of abortion was estimated to be around 15%.

Both spontaneous abortion and induced abortion have been associated with adverse pregnancy outcomes in the subsequent pregnancy including; preterm birth, low birth weight and stillbirth.

Aim: To determine the association between previous abortion and the subsequent pregnancy outcomes among women who delivered at the regional referral hospitals in Dar es Salaam.

Methods: A retrospective cohort study was conducted at Mwananyamala, Temeke and Amana Regional Referral hospitals in Dar es salaam. A total of 400 post-delivery women with a prior history of abortion and 400 with a live birth in the first pregnancy were enrolled in the study. Data was obtained from the patients' files in the post-natal ward, antenatal cards and from the patient using an interviewer structured questionnaire. The dependent variables were gestational age at delivery, birth weight and fetal status at birth. The independent variable was a history of abortion in the first pregnancy.
Data analysis was entered into the Statistical Package for Social Scientists (SPSS) version 23 and analysis was done with chi-square test and logistic regression analysis. The P-value of <0.05 was considered significant.

Results: Preterm delivery was more common among women with a previous history of abortion, 9.2% as compared to 5.2% in women who had a live birth in the previous pregnancy. Women with a history of abortion were found to have an increased risk of getting pre-term delivery compared with those with no history of abortion (RR= 1.04, 95% CI 1.00 – 1.07). In addition, a history of abortion was found to have no association with stillbirth or low birth weight.

Conclusion: The previous history of abortion was associated with a risk of preterm delivery in the subsequent pregnancy. In addition, a history of abortion was found to have no association with stillbirth or low birth weight.

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LIST OF ABBREVIATIONS

CS	Caesarean Section
GA	Gestational Age
IAB	Induced Abortion
IRB	Institution Review Board
IUFD	Intra Uterine Fetal Death
IUGR	Intra Uterine Growth Restriction
LBW	Low Birth Weight
MNH	Muhimbili National Hospital
PROM	Pre-labor Rupture of Membranes
SAB	Spontaneous Abortion
SBF	Still Birth Fresh
SBM	Still Birth Macerated
SGA	Small for Gestational Age
UK	United Kingdom
WHO	World Health Organization

DEFINITION OF TERMS

Adverse pregnancy outcomes: are those pregnancy outcomes other than normal live birth which will include preterm birth, stillbirth and low birth weight.

State of viability: in our setting is from 28 weeks and above.

The standard definition of Abortion: Abortion is the pregnancy loss that occurs before the 20^{th} week of gestation or the expulsion or extraction of an embryo or fetus weighing 500g or less from its mother when it is not capable of independent survival.

- In this study, it is defined as the pregnancy loss that occurs before the 28^{th} week of gestation

INTRODUCTION

BACKGROUND

Abortion is the pregnancy loss that occurs before the 20th week of gestation or the expulsion or extraction of an embryo or fetus weighing 500g or less from its mother when it is not capable of independent survival (WHO). It is among the most common complications of pregnancy. Early pregnancy loss, which occurs in the first trimester, is the most common type. When it happens, it causes distress and substantial anxiety for couples hoping for a child especially if it happens in the first pregnancy.

Globally, 122 million live births occur annually and of these, 2.7 million results in neonatal deaths. In addition, women experience an estimated rate of 28 million spontaneous abortions and 2.6 million stillbirths (USAID, 2014).

Abortion or spontaneous pregnancy loss before 28 completed weeks of gestation is estimated to affect 10–15% of pregnancies (2). In Tanzania the rate of abortion was estimated to be around 15%, however, the causes of these abortions have not yet been documented (3). Both spontaneous abortion and induced abortion have been associated with adverse pregnancy outcomes in a subsequent pregnancy including; preterm birth, low birth weight and stillbirth (4).

Although a history of first-trimester recurrent spontaneous abortion is regarded as a risk factor in antenatal care, the characteristic of subsequent pregnancy outcome is not elucidated. Abortion has been suggested to be related to fetal pathology, congenital abnormality, low birth weight, low Apgar score, intrauterine growth retardation, and preterm labor in the next pregnancy (5).

It is recommended that women with 2 or more spontaneous consecutive abortions should be candidates for clinical and laboratory evaluation to find a possible etiology leaving behind

those who have had one abortion (6). Nevertheless, investigations on the cause of abortion are often incomplete and the unavailability of perinatal pathology precludes post-mortem examination at early gestations. (7). It is important to establish the causes of the abortions so as to prepare on how to handle the next pregnancy and in the process prevent adverse pregnancy outcomes.

Surgical management of abortion which includes dilatation of the cervix is among the risk factors for cervical incompetence resulting in abortions and preterm deliveries in subsequent pregnancies. Additionally, uterine curettage during abortions may lead to poor placentation and placental insufficiency in the next pregnancy resulting in placenta previa, abruption and pre-eclampsia which further result in poor fetal and neonatal outcomes namely intrauterine growth restriction, intrauterine fetal death, fetal distress, and low birth weight (5).

Studies that have been done and documented have mainly focused on the risk of further abortion in these women (8). Few attempted to study obstetric and perinatal outcomes in subsequent pregnancies that progressed beyond 28 weeks. To the best of my knowledge, there is scanty literature in Africa particularly in Tanzania that focused on the outcome of a subsequent pregnancy following an abortion. With the significant proportion of abortion globally and in Tanzania there was a need to study the effects of abortion on the outcome of the next pregnancy, particularly in our setting. Therefore, this study was done to help in bringing more light in our setting on this area and help to improve overall maternal and child health.

LITERATURE REVIEW

According to Omani-Samani et al. 2018 in a cross-sectional study done in Iran to evaluate associations between a history of spontaneous abortion and preterm delivery during subsequent pregnancies, it was found that a history of spontaneous abortion and a history of recurrent spontaneous abortion were associated with increased odds of preterm delivery. Further, the odds of preterm delivery increased as the number of prior spontaneous abortions did. However, due to limitations such as small sample sizes, self-reported outcomes, and an inability to adjust for many potential confounders, the effect of spontaneous abortions on subsequent pregnancies needs clarification (9).

Another prospective cohort study by Bakshi et al. 2015 was done in India to determine the pregnancy outcome following a previous spontaneous abortion (miscarriage) on 800 gravida-2 patients: 300 patients, (study group) whose previous pregnancy/pregnancies, were spontaneously aborted, and 500 patients (control group), whose previous pregnancy went to term, and a live fetus was delivered. According to this study, prior spontaneous abortion was found to be a risk factor for the next pregnancy outcome, and it has some consequences like in other studies making the present pregnancy a high-risk pregnancy (5). The findings from this and previous studies show that further research is required to evaluate pregnancy outcomes following a previous abortion.

According to a cross-sectional survey done by Ahrens et al. 2016 in the United States to evaluate the association between pregnancy loss history and adverse pregnancy outcomes, it was found that specific aspects of pregnancy loss history, including the number, gestational age, and recency of losses, may be associated with adverse pregnancy outcomes in subsequent pregnancies. (10).

In a secondary analysis done in the USA, an increased risk of adverse pregnancy outcomes in low-risk women with a history of either spontaneous abortion (SAB) or induced abortion (IAB) was identified. It was also found that a history of one spontaneous abortion is associated

with an increased risk of perinatal death in a subsequent pregnancy. A history of two or more spontaneous abortions was associated with an increased risk of spontaneous preterm birth, perinatal death, and birth weight less than the fifth percentile compared with primigravid women. These findings are consistent with previous reports and raise new questions about pathways that might explain the observed associations (4).

A meta-analysis of 37 studies addressing women with single induced pregnancy termination found an increased risk for low birth weight and increased risk for preterm delivery (11), but not for small for gestational age (SGA) as was found in a retrospective case series study done by Goldstein et al. 2002 on neonatal outcomes in immediate versus delayed conceptions after spontaneous abortion (12).

In a retrospective cohort study done in Scotland, the effects of a single miscarriage on a subsequent continuing pregnancy were examined. It was found that women with a previous miscarriage were prone to adverse perinatal outcomes in the next pregnancy in comparison with women who had a successful first pregnancy and women with no previous pregnancies. Women with a previous miscarriage were at higher risk of threatened miscarriage and preterm delivery. They were also more likely to have interventions during labor and delivery. However, despite evidence of statistical significance in terms of relative risks, the absolute risks of adverse perinatal outcomes were low (13).

Previous abortion is a significant risk factor for low birth weight and preterm birth and the risk increases with the increasing number of previous abortions. These were the findings in a multicenter study done in the USA to investigate the association between previous abortion and low birth weight and preterm birth (14). Women with prior second trimester pregnancy loss are at significantly increased risk for spontaneous preterm birth and recurrent second trimester loss in their next pregnancy. This is according to a retrospective cohort study that was done to determine whether second trimester pregnancy loss was associated with increased

risk for spontaneous preterm birth or recurrent second trimester pregnancy loss in a subsequent pregnancy (15).

Another prospective cohort study that was done in Iran to determine the pregnancy outcome following a previous spontaneous abortion found that a prior spontaneous miscarriage is a risk for the next pregnancy, and the risk of abortion and intrauterine fetal death will increase (16).

A retrospective, population-based study was done in Israel to determine whether 1 previous miscarriage is associated with an increased rate of adverse pregnancy outcomes in the following pregnancy. It was found that an initial miscarriage is independently associated with adverse pregnancy outcomes such as intrauterine growth restriction (IUGR), prelabour rupture of membranes (PROM), pre-term delivery, as well as perinatal mortality. Nevertheless, these associations deserve further investigations (2).

Another study done in Taiwan aimed to quantitatively estimate the long-term risk of abortion-related consequences and comorbidities. Abortion appeared to have little influence on the subsequent pregnancy. Spontaneous abortion (SAB) or induced abortion (IAB) did not result in a significantly elevated hazard ratio in the subsequent pregnancy (17).

Therefore, only a handful of studies have examined the history of non-recurrent pregnancy loss on the risk of adverse pregnancy outcomes at subsequent pregnancy among primiparous women. However, these studies have been limited by sparse reproductive history information, including lack of data on the gestational age of loss and when did the loss occur. This is because most of the studies used national health data.

CONCEPTUAL FRAMEWORK

This study intended to determine whether a prior history of abortion affects the subsequent pregnancy outcomes. The independent variable of this study was the prior history of abortion among post-delivery women. The dependent variable of the study was the adverse pregnancy outcomes which in this study focused on preterm birth, low birth weight and stillbirth. Figure 1, below illustrates the relationship between the independent variable and the dependent variable.

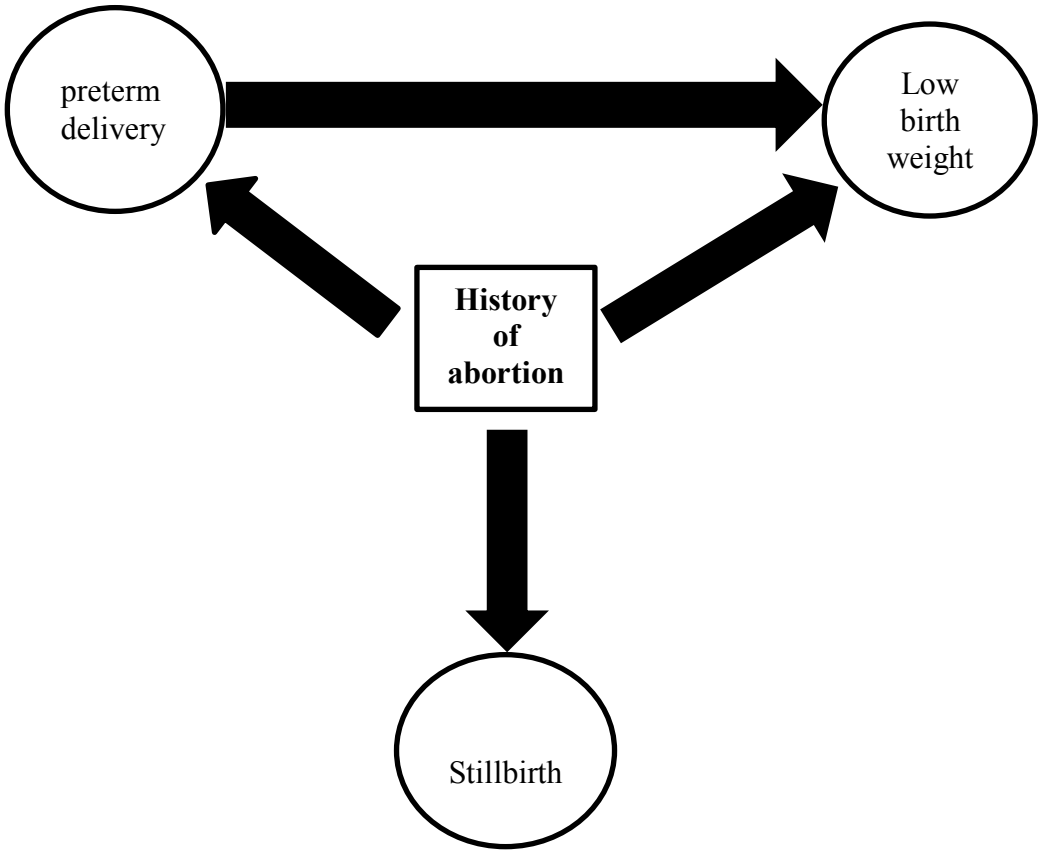

Figure 1: Conceptual Framework of the study

PROBLEM STATEMENT

Abortion or spontaneous pregnancy loss before 28 completed weeks of gestation is estimated to affect 10–15% of pregnancies (2). In Tanzania, the rate of abortion was estimated to be around 15% (3).

Both spontaneous abortion and induced abortion have been associated with adverse pregnancy outcomes in the subsequent pregnancy including; preterm birth, low birth weight and stillbirth.

To the best of my knowledge, there is scanty literature in Africa particularly in Tanzania that focused on the outcome of a subsequent pregnancy following a prior history of abortion. With the significant rate of abortion globally and in Tanzania there was a need to assess the pregnancy outcome among women with a prior history of abortion as the magnitude of this problem is still unknown in our setting.

RATIONALE

The findings of this study help the health planners and health care providers in setting plans to increase antenatal surveillance for women with a history of abortion so as to improve maternal and fetal outcomes. The study raises awareness of the magnitude of the problem and provides more information regarding pregnancy outcomes among women with a prior history of abortion in our setting.

RESEARCH QUESTION

The research question of this study was as follows;

> What is the association between prior history of abortion and adverse pregnancy outcomes on the subsequent pregnancy?

OBJECTIVES

BROAD OBJECTIVE

To determine the association between previous abortion and the subsequent pregnancy outcomes among women who delivered at the regional referral hospitals in Dar es Salaam.

SPECIFIC OBJECTIVES

1. To determine the association between previous abortion and pre-term delivery.
2. To determine the association between previous abortion and low birth weight.
3. To determine the association between previous abortion and stillbirth.

METHODOLOGY

STUDY DESIGN

A retrospective cohort study was done. This research design was used as both exposure and the outcome had already occurred. Data was collected for six months.

STUDY AREA

This study was conducted in the labor and postnatal wards of Mwananyamala, Temeke and Amana regional referral hospitals in Dar-es-Salaam. The regional referral hospitals are located in an urban area and they provide service to Temeke, Kinondoni and Ilala district population as well the neighboring districts. In these hospitals, the average number of deliveries per day was about 15 to 30 making a total of around 450 to 600 deliveries per month. The three hospitals had a total number of 8494 deliveries during six months of data collection. Delivery services were provided for 24 hours every day. Deliveries took place in the labor wards for those who delivered vaginally and theatre for those who delivered by abdominal delivery. Once a pregnant woman arrived at any of the above-mentioned hospitals for delivery services, she was registered and had their vital signs checked. A short history was taken followed by an initial examination to ascertain if the woman was in labor. If she was found to be in labor, then she would remain in the labor ward and if not in labor she would be taken to the antenatal ward. After delivery women were sent to the postnatal wards. Those who delivered normally were observed for 24 hours before being discharged and those who delivered abdominally received post-operation care for about three days before being discharged. In the labor and postnatal wards, all post-delivery women were reviewed and those who were willing to participate were enrolled in the study.

STUDY POPULATION

The study population for this research was all post-delivery women in the labor and post-natal wards at Mwananyamala, Temeke and Amana regional referral hospitals from October 2020 to March 2021.

STUDY SAMPLE

The study sample for this research consisted of the exposed group who were all women who had delivered for the first time and had an abortion in the first pregnancy and the non-exposed group were women who had delivered for the second time and had a live birth in the first pregnancy.

SAMPLE SIZE

From the study done in Israel (2) the proportion of women with an initial miscarriage who had adverse pregnancy outcomes (preterm delivery) was 14.5% and those without an initial miscarriage who had adverse pregnancy outcomes (preterm delivery) was 8.4%. Using the same proportion, the

the sample size for this study was calculated by using the formula below;

$$\text{n per grp} = \frac{(p_0 q_0 + p_1 q_1)\,(z_{1-\alpha/2} + z_{1-\beta})^2}{(p_1 - p_0)^2}$$

Input

p_0 = proportion with characteristic in group 1

$q_0 = (1 - p_0)$ proportion without characteristic in group 1

p_1 = proportion with characteristic in group 2

$q_1 = (1 - p_1)$ proportion without characteristic in group 2

$z_{(1-\alpha/2)}$ = value of the standard normal distribution corresponding to a significance level of α (1.96 for a 2-sided test at the 0.05 level)

$z_{(1-\beta)}$ = value of the standard normal distribution corresponding to the desired level of power (0.84 for a power of 80%, 1.28 for power of 90%)

Where;

n = minimum required sample size

p_0 = 14.5%

= 0.145

q_0 = (1-0.145)

= 0.855

p_1 = 8.4%

=0.084

q_1 = (1-0.084)

= 0.916

$z_{(1-\alpha/2)}$ = 1.96

$z_{(1-\beta)}$ = 0.84

substituting these into the formula n=394, which is the minimum required sample size.

adjusting for non-response rate

$$\frac{394x(100)}{100-f\%}$$

where f% is non-response percentage=10%

$$\frac{394x(100)}{90}$$

n=438

SAMPLING PROCEDURE

At each hospital, a simple random probability sampling technique was used. The women with a history of one abortion and those without a history of abortion were recruited separately. Each day the number of women who had delivered was acquired. Through antenatal cards, women with prior history of abortion and those with a live birth in the first pregnancy were identified. Numbers were assigned in each group and picked randomly. Those who were picked were then screened for eligibility through a checklist. All eligible women who met the inclusion criteria and consented to participate were recruited into the study. Recruitment of participants was conducted every day for six months.

VARIABLES

The dependent variables were gestational age at delivery, birth weight and fetal status at birth. The gestational age at delivery was determined using the last normal menstrual period and ultrasound done in the first trimester. Gestational age below 37 weeks was considered as preterm and gestational age at 37 completed weeks and above was considered as term. For the birth weight, below 2500g was considered low birth weight and birth weight of 2500g and above was considered as normal birth weight. Fetal status at birth was determined using the Appearance, Pulse, Grimace, Activity, Respiration (APGAR) score. A score of 0 was defined as stillbirth and a score of 1 and above was considered alive.

The independent variable was a history of abortion in the first pregnancy and this was defined as pregnancy loss at a gestational age of less than 28 weeks.

INCLUSION CRITERIA

The inclusion criteria for this study were all women who had delivered for the first time with a history of one abortion, the exposed group and all women who delivered for the second time with a live birth in the previous pregnancy, the non-exposed group who were willing to participate in the study.

EXCLUSION CRITERIA

The exclusion criteria for this study were women with known uterine anomalies, maternal systemic diseases and congenital or genetic disorders. These conditions are known to be causative factors for abortion and adverse pregnancy outcomes such as pre-term birth, stillbirth and low birth weight.

DATA COLLECTION PROCEDURE

Data collection was done by the principal investigator and six research assistants, whereby two research assistants were located at each hospital. The research assistants were medical students and clinical officers who received ongoing training on how to recruit participants, fill the information on the questionnaires and abide by ethical principles.

The entry point for the recruitment of participants was labor ward and postnatal wards. Where files were obtained from which the antenatal card was used to identify eligible participants. The eligible participants were recruited into the study after confirming the information on the antenatal cards. The aim of the study was explained to participants after which written consent to participate in the study was sought from them. Data was therefore obtained from the participants using the antenatal card and an interviewer-administered structured questionnaire. Data was collected for six months. The principal investigator supervised the data collection procedure on weekly basis and the data collected was checked daily for missed or ambiguous data.

DATA COLLECTION TOOL

An interviewer-administered structured questionnaire was used as a data collection tool. This tool aided in getting accurate and reliable information as it allowed clarification of questions and responses as well as probing for additional information.

The questionnaire consisted of four sections. The first section included demographic data such as; age, education level, marital status and occupation status. The second section included information on the first pregnancy such as; gestational age at delivery or abortion, the intervention provided following abortion and the inter-pregnancy interval. The third section

contained information on the second pregnancy such as; gestational age at delivery, antenatal care (ANC) booking and frequency and level of ANC attended. The fourth section consisted of fetal outcomes such as; the Apgar score, birth weight, neonatal intensive care unit admission, fetal status at birth and neonatal status in a week.

DATA ANALYSIS

Data collected were coded and entered daily onto Statistical Package of Social Sciences (SPSS) version 23 by the principal investigator. It was then cleaned and analyzed with a chi-square test and logistic regression analysis. The P-value of <0.05 was considered to be significant. Frequency distribution tables have been used to present variables.

ETHICAL CLEARANCE

Ethical clearance was issued to the principal investigator by the Senate Research and Publication Committee which is the Institutional review board (IRB) of (MUHAS) and permission to conduct the study was given by the Head of Department of Obstetrics and Gynecology and the Director of Research of Amana, Mwananyamala and Temeke regional referral hospitals. Interviews were done in a manner that observed privacy. No personal identifiers were collected on data collection forms and none has appeared on the results from data analysis. Completed questionnaires have been under the custody of the PI and the electronic SPSS database contains coded information and is secured with a password. Collected information and research data will be stored for additional 5 years following dissemination and publication of study results; thereafter the data may be destroyed.

RESULTS

During the study period, a total of 871 were eligible for the study. Out of them 71 did not consent to continue with the study. Of the 800 who remained, 400 were those who had delivered for the first time and had an abortion in the first pregnancy and the other 400 women were those who had delivered for the second time and had a live birth in the first pregnancy.

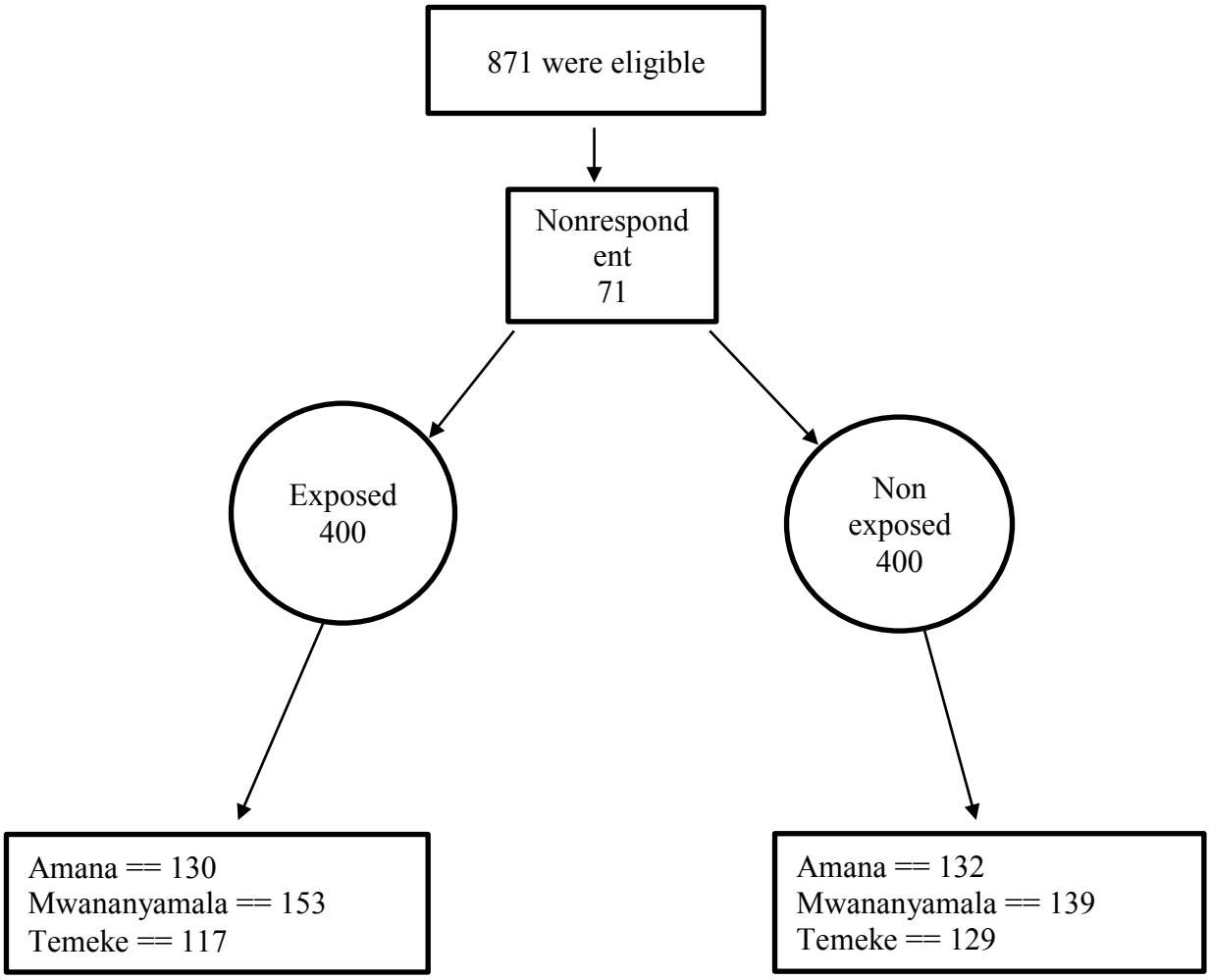

Figure 2: Enrollment at the hospitals

Enrollment of the clients at the three regional hospitals as shown in figure 2 above

Table 1: Baseline characteristics of the study participants (N=800)

Variable	Exposed n (%)	Non exposed n (%)
Age (years)		
< 20	14 (3.5)	4 (1.0)
20 – 30	343 (85.7)	311 (77.8)
>30	43 (10.8)	85 (21.2)
Marital status		
Single	91 (22.8)	46 (11.5)
Married	309 (77.2)	354 (88.5)
Education status		
No to Primary education	112 (28.0)	184 (46.0)
Secondary education	210 (52.5)	183 (45.8)
College or university	78 (19.5)	33 (8.2)
Occupation status		
Self-employed	162 (40.5)	227 (56.8)
Employed	75 (18.7)	40 (10.0)
Unemployed	163 (40.8)	133 (33.2)
Intervention after abortion		
Medical	132 (33.0)	
Surgical	248 (62.0)	
None	20 (5.0)	
Inter pregnancy interval		
Within the last 6 months	16 (4.0)	
6-11 months	126 (31.5)	
12-23 months	170 (42.5)	
2 years or more	88 (22.0)	
Antenatal visits		
< 8	383 (95.7)	372 (93.0)
≥ 8	17 (4.3)	28 (7.0)
Gestational age one		
Less than 14	252 (63.0)	
14 to 27	148 (37.0)	
28 and above		400 (100)
Gestational age two		
< 37	37 (9.3)	21 (5.3)
≥ 37	363 (90.7)	379 (94.7)
APGAR scores		
< 6	17 (4.3)	14 (3.5)
≥ 6	383 (95.7)	386 (96.5)

In both groups, the majority were aged between 20-30 years and were married. In both groups, the majority had less than 8 antenatal visits (95.7% and 93%) as shown in table 1.

Table 2: Association between abortion and pre-term delivery

Variable	Category	Gestational age		P-value
		< 37 weeks n (%)	≥ 37 weeks n (%)	
Abortion	Yes	37 (9.2)	363 (90.8)	**0.029**
	No	21 (5.2)	379 (94.8)	

Preterm delivery was more common among women with a previous history of abortion, 9.2% as compared to 5.2% in women who had a live birth in the previous pregnancy with a significant statistical association (P= 0.029)

Table 3: Association between abortion and birth weight

Variable	Category	Birth weight		P-value
		Underweight n (%)	Normal n (%)	
Abortion	Yes	61 (15.2)	339 (84.8)	0.261
	No	50 (12.5)	350 (87.5)	

Low birth weight was more common among women with a previous history of abortion, 15.2% as compared to 12.5% in women who had a live birth in the previous pregnancy however there was no statistical association.

Table 4: Association between abortion and stillbirth

		Stillbirth status		
Variable	**Category**	**Stillbirth n (%)**	**Alive n (%)**	**P-value**
Abortion	Yes	9 (2.3)	391 (97.7)	0.651
	No	11 (2.7)	389 (97.3)	

Stillbirth was less common among women who had a previous history of abortion as well as those with a live birth in the previous pregnancy.

Table 5: Univariate analysis of the history of abortion and preterm delivery

	Univariate analysis		
Variable	**RR**	**95% CI**	**P-value**
Abortion			
Yes	1.04	1.00 – 1.07	**0.029**
No	Ref		

Key: RR: relative risk, Ref: reference group

Women with a history of abortion were found to have an increased risk of getting preterm delivery compared with those with no history of abortion (RR= 1.04, 95% CI 1.00 – 1.07)

Table 6: Univariate and Multivariate analysis of factors associated with low birth weight

	Univariate analysis			Multivariate analysis		
Variable	**cRR**	**95% CI**	**P-value**	**aRR**	**95% CI**	**P-value**
Preterm delivery						
Yes	8.09	5.49 – 11.80	< 0.001	8.08	5.45 – 11.83	< 0.001
No	Ref			Ref		
Abortion						
Yes	1.22	0.84 – 1.78	0.297	1.01	0.69 – 1.48	0.954
No	Ref			Ref		

Key: cRR: crude relative risk, aRR: adjusted relative risk, Ref: Reference group

Women with preterm delivery are 8.08 times more likely to have neonates with low birth weight (RR=8.08, 95% CI 5.45 – 11.83) as compared to those with term delivery. The history of abortion was not found to be associated with low birth weight.

Table 7: Univariate analysis of the history of abortion and stillbirth

	Univariate analysis		
Variable	**RR**	**95% CI**	**P-value**
Abortion			
Yes	0.82	0.33 – 1.96	0.652
No	Ref		

Key: RR: relative risk, Ref: reference group

The history of abortion was not found to be associated with a still birth.

DISCUSSION

This retrospective cohort study showed that adverse pregnancy outcomes were more among women with a previous history of abortion than in those who had a live birth in the previous pregnancy. The findings are consistent with a prospective cohort study done in India where prior spontaneous abortion was found to be a risk factor for the next pregnancy outcome, making the present pregnancy a high-risk pregnancy (5).

However, these findings differ from those deducted in a study done in Taiwan aimed to quantitatively estimate the long-term risk of abortion-related consequences and comorbidities where abortion appeared to have little influence on the subsequent pregnancy. SAB or IAB did not result in a significantly elevated hazard ratio in the subsequent pregnancy (17).

The present study showed preterm delivery was more common among women with a previous history of abortion as compared to women who had a live birth in the previous pregnancy. The present results were in line with an earlier report by Omani-Samani et al., which found that a history of spontaneous abortion and a history of recurrent spontaneous abortion were associated with increased odds of preterm delivery. Further, the odds of preterm delivery increased as the number of prior spontaneous abortions did (9). In addition, another study done in Pennsylvania found out that women with prior second trimester pregnancy loss are at significantly increased risk for spontaneous preterm birth and recurrent second trimester loss in their next pregnancy (15).

This finding is contrary to a retrospective cohort study done in Scotland, which reported that women with a previous miscarriage were prone to pre-term delivery and low birth weight in the next pregnancy in comparison with women who had a successful first pregnancy and women with no previous pregnancy. However, despite evidence of statistical significance in terms of relative risks, the absolute risks of adverse perinatal outcomes were low (13).

Low birth weight was more common among women with a previous history of abortion as compared to women who had a live birth in the previous pregnancy. However, this association was not significant. This is contrary to the findings in a multicenter study done in the USA that found a previous abortion is a significant risk factor for low birth weight and preterm birth and the risk increases with the increasing number of previous abortions.(14) The present study findings were contrary to the latter report probably because our study analyzed low birth weight in women who had a history of one previous abortion. While the latter study analyzed low birth weight in women with a history of one or more history of abortions.
In addition, women with pre-term delivery were found to have an increased risk of getting low birth weight neonates.

The previous history of abortion did not affect the occurrence of stillbirths on the subsequent pregnancy. These findings differ from those from a prospective cohort study that was done to determine the pregnancy outcome following a previous spontaneous abortion and found that a prior spontaneous miscarriage is a risk for the next pregnancy, and the risk of abortion and intrauterine fetal death will increase (16).

STRENGTH

The study was centered among different regional hospitals hence providing diversity among the study population, increasing the ability to generalize the study results.

LIMITATIONS OF THE STUDY

This study involved women who had encountered pregnancy loss; which is a matter of grief to many especially those who had another adverse pregnancy outcome. This resulted in an unwillingness to participate in the study as it brought back bad memories hence it took a long time to collect data. This was mitigated by a long period of counseling and reassurance.

Getting eligible clients during the Covid -19 pandemic was difficult as patients were advised to get service at nearby health centers to avoid congestion in the regional referral hospitals making the data collection duration longer.

CONCLUSION

Women with a history of abortion were found to have an increased risk of getting pre-term delivery in the subsequent pregnancy as compared with those with no history of abortion. In addition, a history of abortion was found to have no association with stillbirth or low birth weight.

RECOMMENDATIONS

Maternal care providers are advised to carefully take these results into account to inform women adequately, supporting them in understanding potential adverse pregnancy outcomes that might be associated with previous abortion.

Further studies should be done in this area particularly in Africa and Tanzania to fill the existing gap on information regarding the association between the previous history of abortion on subsequent pregnancy outcomes.

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APPENDICES

APPENDIX I. INFORMED CONSENT

MUHIMBILIUNIVERSITY OF HEALTH AND ALLIED SCIENCES

DIRECTORATE OF RESEARCH AND PUBLICATIONS, MUHAS

INFORMED CONSENT FORM

ID-NO | | | | |

Consent to participate in a research study

Greetings! My name is Judith Edward and I am a student at Muhimbili University undertaking Masters of Obstetrics and Gynecology. Currently, I am working on this research: Pregnancy outcome among post-delivery women with a prior history of abortion at regional referral hospitals in Dar es salaam from September 2020 to April 2021.

Confidentiality

All information recorded will be entered into computers with only the study identification number. However, no participant's name will be published. We do not expect that any harm will happen to you after joining this study.

Rights to Withdraw and Alternatives

Taking part in this study is completely your choice. You are free to choose either to participate in this study or not. You can decide to stop participating in this study any time you wish even if you have already given your consent. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefits to which you are otherwise entitled.

Benefits

If you agree to take part in this study, there are no direct benefits that you will get from this study.

Risks

We do not expect that you will get any physical injury resulting from participating in this study.

Who to Contact

If you ever have questions about this study, your rights as a participant, you should contact Dr. Bruno Sunguya of the University Research and Publications Committee, P.O. Box 65001, Dar es Salaam. Tel: 21503026

Signature

Do you agree to participate?

She has agreed…….. she has refused…….

I……. have read the content in this form. My questions have been thoroughly answered. I agree to participate in this study

Signature of participant……..

Signature of witness (if the participant cannot read) ……

Signature of Researcher……..

Date of participation …….

APPENDIX I. FOMU YA RIDHAA

CHUO KIKUU CHA AFYA NA SAYANSI SHIRIKISHI MUHIMBILI

KURUGENZI YA UTAFITI NA UCHAPISHAJI

FOMU YA RIDHAA

Namba ya Utambulisho: | | | | |

Ridhaa ya kushiriki katika utafiti

Habari!

Jina langu ni Judith Edward, ni Mwanachuo katika chuo kikuu cha Muhimbili ninayesomea shahada ya pili katika uzazi na magonjwa ya wanawake. Nafanya utafiti kujua : Matokeo ya ujauzito kwa mama ambaye ameshajifungua na ana historia ya mimba kutoka katika ujauzito uliopita.

Usiri

Majibu yote yatakusanywa kutoka katika eneo la utafiti na yataingizwa kwenye kompyuta kwa kutumia namba ya utambulisho tu. Hakuna jina la mshiriki litakalo chapishwa. Hatutegemei kwamba kutakuwa na madhara yoyote kwa wewe kujiunga na utafiti huu isipokuwa kutumia muda wako tu katika majadiliano.

Haki ya Kutokana Mbadala

Kushiriki katika utafiti huu ni uchaguzi wako, na una uhuru wakukubali au kukataa kushiriki katika utafiti huu. Pia unaweza kuacha kushiriki katika utafiti huu muda wowote utakapojisikia hivyo hata kama umeshakubali kushiriki. Kukataa kushiriki au kuacha kushiriki katika utafiti huu hakuta kufanya upate adhabu au ukose kufaidika na yale unayostahili kupata.

Faida

Uki kubali kushiriki katika utafiti huu hakuna faida ya moja kwa moja utakayopata

Madhara

Hatutegemei kwamba uta pata madhara yoyote ya kimwili kwa kushiriki katika utafiti huu.

Mawasiliano

Kama utakuwa na swali lolote kuhusu utafiti huu unaweza kuwasiliana na Dr. Bruno Sunguya, Mwenyekiti wa kitengo cha utafiti, Chuo cha Afya na sayansi shirikishi Muhimbili, P.O.Box 65001, Dar es salaam. Simu: 2150302-6.

Sahihi

Je umekubali?

Mshiriki amekubali……. Mshiriki Hajakubali…….……

Mimi.....nimesoma maelezo ya fomu hii. Maswali yangu yamejibiwa. Nime kubali kushiriki katika utafiti huu.

Sahihi ya mshiriki……...

Sahihi ya shahidi (kama mshiriki hawezi kusoma) ……..

Sahihi ya mtafiti……..

Tarehe ya ukubali wa kushiriki……...

APPENDIX II. QUESTIONNAIRE

Date: code no.: registration no.

Phone number:

A. Socio-demographic data:

1. Age …….
2. Marital status
   I. Single
   II. Married
   III. Separated
   IV. Divorced
   V. Widow
3. Educational level
   I. No formal education
   II. Primary education
   III. Secondary education
   IV. College or university
4. Occupation status
   I. Self-employed
   II. Employed
   III. Unemployed

B. Information on the first pregnancy

5. Gestational age at delivery/abortion …….
6. Intervention following abortion
   I. Medical
   II. Surgical
   III. None
7. The recency of the pregnancy loss
   I. Within 6 months

II. 6-11 months
III. 12-23 months
IV. 2 years and above

C. Information on second pregnancy

8. Gestational age at delivery…….
9. ANC booking
    I. Yes
    II. No
10. ANC frequency …….
11. Level of ANC attended
    I. Dispensary
    II. Health Centre
    III. Hospital

D. **Fetal outcomes:**

I. Birth weight ….
II. Apgar score 5^{th} min….
III. Admission to NICU
    a) Yes
    b) No
IV. Early neonatal death
    a) Yes
    b) No
V. Fetal status at birth
    a) Alive
    b) Stillbirth

APPENDIX II: DODOSO

Tarehe: namba ya utambulisho: namba ya usajili:
namba ya simu:

A. Taarifa za mama

1. Umri …….
2. Hali ya ndoa
   i. Sijaolewa
   ii. Nimeolewa
   iii. Kutengana
   iv. Talikiwa
   v. Mjane
3. Kiwango cha elimu
   i. Sijasoma
   ii. Elimu ya msingi
   iii. Elimu ya sekondari
   iv. Chuo
4. Kazi
   i. Nimejiajiri
   ii. Nimeajiriwa
   iii. Sina ajira

B. Taarifa za Ujauzito wa kwanza

5. Umri wa mimba wakati wakujifungua/kutoka …….
6. Matibabu baada ya mimba kutoka
   i. Dawa
   ii. Kusafishwa
   iii. Hakuna

7. Mimba ilitoka lini
    i. Ndani ya miezi 6 iliyopita
    ii. Miezi 6-11
    iii. Miezi 12-23
    iv. Miaka miwili na Zaidi

C. Taarifa za Ujauzito wa pili

8. Umri wa mimba wakati wakujifungua……
9. Kujiandikisha kliniki ya wajawazito
    i. Ndio
    ii. Hapana
10. Idadi ya mahudhurio ya kliniki ya wajawazito …….
11. Kliniki ya wajawazito uliyohudhuria
    i. Zahanati
    ii. Kituo cha afya
    iii. Hospitali

D. Matokeo ya mtoto aliozaliwa katika mimba ya pili:

I. Uzito wa kuzaliwa ….
II. APGAR score….
III. Kulazwa wodi ya watoto wachanga
    a) Ndiyo
    b) Hapana
IV. Kifo cha mtoto mchanga ndani ya wiki baada ya kuzaliwa
    a) Ndiyo
    b) Hapana
V. Hali ya mtoto baada ya kuzaliwa:
    a) Hai
    b) Kufa mda mfupi kabla ya kuzaliwa