

## Original Research Article

# Obstetric Outcomes of Teenage Pregnancies and Their Associated Factors in Mwanza Region, Tanzania

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**Abstract:** Teenage pregnancy remains a significant public health concern globally, especially in low- and middle-income countries like Tanzania. It contributes to increased maternal and fetal morbidity and mortality, including complications such as anemia, hypertensive disorders, obstetric hemorrhage, low birth weight, and preterm delivery. Despite various interventions, teenage pregnancy rates remain high. This study aimed to assess obstetric outcomes and associated factors of teenage pregnancy in Mwanza region, Tanzania. A hospital-based cross-sectional study was conducted from April to June 2019 in four hospitals: Misungwi District Hospital, Sengerema District Designated Hospital, Bugando Medical Center, and Sekou Toure Regional Referral Hospital. A total of 357 teenage mothers who met inclusion criteria participated. Data were collected using structured questionnaires and checklists, then analyzed using STATA version 13. The mean age of participants was  $17 \pm 1.3$  years, with 72% from rural areas and 85.7% having no education or only primary education. Most were primiparous (90.2%) and had booked antenatal care (98.9%), though attendance and service utilization were inadequate. Vaginal delivery was common (79.2%). Adverse maternal outcomes included perineal tears (28.4%), anemia (59.7%), and hypertensive disorders (11.8%). Fetal outcomes showed 75% healthy live births, with occurrences of low birth weight (12.9%), small for gestational age (37.2%), and prematurity (14.8%). Hypertensive disorders were independently associated with poor fetal outcomes. The study concludes that teenage pregnancy is high-risk, often leading to adverse maternal and neonatal outcomes, highlighting the need for targeted interventions.

**Keywords:** Teenage Pregnancies, Feto-Maternal Outcomes, Teenage Morbidity, Teenage Pregnancy Complications.

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## INTRODUCTION

Globally, it is estimated that about 16 million adolescent girls aged between 15 to 19 years and 1.5 million girls below 15 years of age give birth annually [1, 2], amounting to about 11% of annual births. Approximately 90% of these births occur in low and middle-income countries like Tanzania [2].

Teenage pregnancies and births are a major public health concern, due to the high rates of morbidity and mortality affecting both mothers and fetus [3]. Pregnancy and childbirth complications in this age group is the number one reason for deaths among women aged 15-19 years [2-4]. WHO estimates that for every teenage maternal death more so are left with injuries, infections and diseases [5]. These include an increased risk of hypertensive disorders, eclampsia, puerperal

endometritis, systemic infections, low birth weight, preterm delivery and psychological disorders such as depressive disorders [3-7].

Teen's age has shown to play an independent role for adverse pregnancy outcomes due to their biological immaturities, gynecological factors including incomplete pelvis growth among others. Moreover psychosocial risks associated with the pregnancy, poses a critical challenge to the adolescents and increase adverse outcome [8-10]. The situation could be further amplified by the teenager's preconception condition and life practices like smoking, substance abuse, poor nutrition, HIV, sexually transmitted infections. Poor health seeking practice amongst teenagers, (especially pregnant ones) has been noted to have poor general attendance to antenatal clinics, either as late first visit or

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inadequate attendance, posing more threat and poor pregnancy outcome [11, 12].

Tanzania's statistics portrayed different picture compared with other East African countries with an upward trend in teenage pregnancies. The 2015 Tanzania demographic health survey (TDHS) showed 27% of women aged 15-19 had begun childbearing, 21% had given birth, while 6% were pregnant with their first child, as compared to 23% in 2010 [13]. Mwanza region is one of the 26 Tanzania mainland's regions with about 28% of teenagers in childbearing age between 15-19 years of age making it a potential place for study as is above nation's average [14].

## MATERIAL AND METHODS

This was a multicenter hospital based cross-sectional study that involved 357 candidates from four hospitals in Mwanza region, Misungwi District Hospital (124), Sengerema District Designated Hospital (137),

Bugando Medical Center (36) and Sekou Toure Regional Referral Hospital (60), from April to June 2019. The study aimed at determining the feto-maternal outcomes and their associated factors among pregnant teenagers. These were randomly selected and informed about the study, and those who consented were enrolled into the study. A structured data collection tool containing questionnaire and checklist sections was used to obtain socio-demographic, clinical and obstetrics information of patients who had met criteria and consented. Data was then analyzed using STATA version 13, according to the study objectives.

## RESULTS

A total of 357 patients were recruited into the study with a mean age of  $17 \pm 1.3$  years. About 32 (9%) of the participants were less than 15 years old. Majority 257 (72.0%) were from rural areas and 241 (67.5%) attained primary school level education. (Table1)

**Table 1: Socio-demographic characteristics (N=357)**

Patient characteristics	Number (n)	Percentage (%)
<i>Age (years)</i>	Mean age $17 \pm 1.3$	
<15	32	9.0
16-17	112	31.4
18-19	213	59.6
<i>Residence</i>		
Urban	100	28.0
Rural	257	72.0
<i>Marital status</i>		
Married	161	45.1
Single	196	54.9
<i>Education</i>		
Illiterate	65	18.2
Primary school level	241	67.5
Secondary school level	51	14.3
<i>Occupation</i>		
Unemployed	145	40.6
Peasant/ petty trader	206	57.7
Employed formal	6	1.7
<i>Parity</i>		
Primepara	322	90.2
Multipara	35	9.8

Majority 316(88.5%) of teenage mothers were prime gravida and 353(98.9%) had attended ANC with most 287(81.3%) starting ANC in second trimester.

About 171(48.4%) had less than 4 ANC visits, less than the Tanzania's recommended number of ANC visits. (Table 2)

**Table 2: Antenatal characteristics of teenagers (n=357)**

Patient characteristics	Number (n)	Percentage (%)
<i>Gravidity</i>		
Prime gravida	316	88.5
Multigravida	41	11.5
<i>Antenatal clinic attendance</i>		
Attended	353	98.9
Not attended	4	1.1
<i>Gestational age at booking</i>		
1 <sup>st</sup> trimester	37	10.5
2 <sup>nd</sup> trimester	287	81.3
3 <sup>rd</sup> trimester	29	8.2

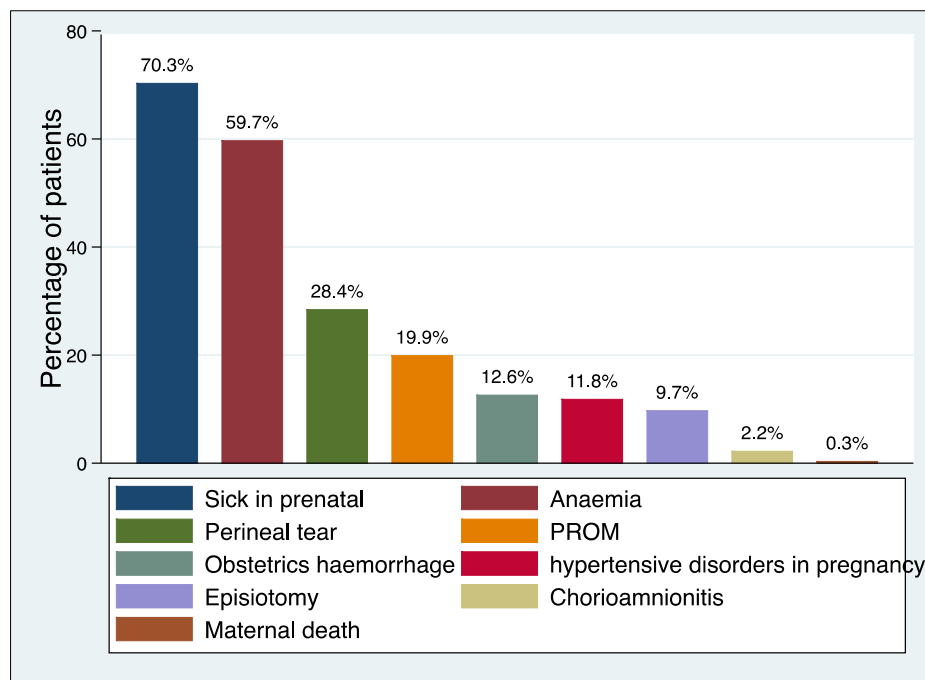
<i>Antenatal clinic visits made</i>		
<4	171	48.4
≥4	182	51.6
<i>ANC clinical examinations</i>		
Complete	310	87.8
Incomplete	43	12.2
<i>ANC clinical investigations</i>		
Complete	39	11.0
Incomplete	314	89.0
<i>ANC medications and supplements</i>		
Complete provided	102	28.9
Incomplete provided	246	69.7
Not provided	5	1.4
<i>Health education provision</i>		
Given	229	64.9
Not given	124	35.1
<i>Delivery plan</i>		
Indicated	171	48.4
Not indicated	182	51.6
<i>Birth preparedness</i>		
Prepared	127	36.0
Not prepared	226	64.0

On mode of delivery majority of teenage mothers 283(79.2%) delivered by vaginal route and 68(19.0%) underwent caesarean section for various indications. Eighty-two (28.4%) among those who had

vaginal birth had variable degrees of perineal tears. Eight (2.2%) participants had chorioamnionitis and there was 1(0.3%) maternal death. (Table 3) and (Fig. 1).

**Table 3: Maternal outcome of teenage pregnancy (n=357)**

<b>Maternal outcome</b>	<b>Number(n)</b>	<b>Percentage (%)</b>
<i>Anemia</i>		
Yes	213	59.7
No	144	40.3
<i>Hypertensive disorders in pregnancy</i>		
Yes	42	11.8
No	315	88.2
<i>Obstetric hemorrhage</i>		
Yes	45	12.6
No	312	87.4
<i>Type of obstetrics hemorrhage</i>		
APH	17	4.8
PPH	28	7.8
<i>Mode of delivery</i>		
Spontaneous Vaginal delivery	283	72.9
Operative vaginal delivery	6	1.7
Caesarean section	68	19.0
<i>Chorioamnionitis</i>		
Yes	8	2.2
No	349	97.8
<i>Premature Rupture of Membranes</i>		
No	286	80.1
Yes	71	19.9
<i>Perineum post delivery</i>		
Normal	179	61.9
Perineal tear	82	28.4
Episiotomy	28	9.7
<i>Maternal mortality</i>		
Alive	356	99.7
Dead	01	0.3



**Figure 1: Proportional of adverse maternal outcomes of teenage pregnancy n=357**

Majority 268(75%) of babies were born alive and well but about 67(18.8%) required advanced resuscitation after delivery and they recovered. However 7(2.0%) were still births (either fresh still birth or macerated still birth). The fetal deaths were caused by

maternal complications, Antepartum hemorrhage 2(0.5%), hypertension 3(0.8%) and anemia 2(0.5%).

About 133(37.2%) newborn babies were small for gestational age and 53(14.8%) were premature babies (Table 4).

**Table 4: Fetal outcomes of teenage pregnancy**

Fetal outcome	Number (n)	Percentage (%)
<i>Neonatal status at birth</i>		
Alive and healthy	268	75.0
Alive with complication necessitated resuscitation	67	18.8
Alive but needed hospital admission	15	4.2
Stillbirth	7	2.0
<i>Birth weight</i>		
<2500 grams	46	12.9
≥2500 grams	311	87.1
<i>Head circumference</i>		
<33 cm	133	37.2
≥33cm	224	62.8
<i>Gestation age at delivery</i>		
< 37 weeks	53	14.8
≥37 weeks	304	85.2

#### Factors Associated with Poor Maternal Outcome

Urban residence was found to have association with poor maternal outcomes among teenage mothers

(OR 0.5; 95% CI 0.2-0.9; P-value 0.023), however there was no independent predictor of poor maternal outcome among teenage pregnant patients (Table 5).

**Table 5: Factors associated with poor maternal outcome among teenage pregnancy in Mwanza region**

Variable category		Maternal outcome		Univariate		Multivariate	
		Good n(%)	Poor n(%)	OR(95%CI)	P-value	AOR(95%CI)	P-value
Age	13-15 years	5(15.6)	27(84.4)	1			
	16-17 years	26(23.2)	86(76.8)	0.6(0.2-1.8)	0.360		
	18-19 years	48(22.5)	165(77.5)	0.6(0.2-1.8)	0.379		

<i>Residence</i>	Rural	65(25.3)	192(74.7)	1			
	Urban	14(14.0)	86(86.0)	2.1(1.1-3.9)	<b>0.023</b>	0.5(0.3-1.1)	0.112
<i>Marital status</i>	Single	37(18.9)	159(81.1)	1			
	married	42(26.1)	119(73.9)	0.6(0.4-1.1)	0.104		
<i>Education</i>	Illiterate	19(29.2)	46(70.8)	1			
	Primary school level	49(20.3)	192(79.7)	1.6(0.9-3.0)	0.128		
	Secondary school level	11(21.6)	40(78.4)	1.5(0.6-3.5)	0.351		
<i>Occupation</i>	Unemployed	31(21.4)	114(78.6)	1			
	Petty trader/peasants	47(22.8)	159(77.2)	0.9(0.5-1.5)	0.750		
	Employed	1(16.7)	5(83.3)	1.3(0.15-12)	0.783		
<i>Gravidity</i>	Primegravida	69(21.8)	247(78.2)	1			
	Multivragida	10(24.4)	31(75.6)	0.8(0.4-1.8)	0.711		
<i>ANC visits</i>	<4 visits	35(20)	140(80)	1			
	≥4 visits	44(24.2)	138(75.8)	0.8(0.5-1.3)	0.343		
<i>GA at ANC booking</i>	Never & 1 <sup>st</sup> trimester	6(14.6)	35(85.4)	1			
	2 <sup>nd</sup> trimester	68(23.7)	219(76.3)	0.6(0.2-1.4)	0.200		
	3 <sup>rd</sup> trimester	5(17.2)	24(82.8)	0.8(0.2-3.0)	0.768		
<i>ANC medications Or supplements</i>	None & Some given	57(22.4)	198(77.6)	1			
	All given	22(21.6)	80(78.4)	1.0(0.6-1.8)	0.872		
<i>ANC Health education</i>	Not provided	26(20.5)	101(79.5)	1			
	Provided	53(23.0)	177(77.0)	0.9(0.5-1.5)	0.576		
<i>Birth preparedness</i>	Not planned	47(20.5)	182(182)	1			
	Planned	32(25.0)	96(75.0)	0.8(0.5-1.5)	0.329		
<i>Delivery plan</i>	Not indicated	36(19.4)	150(80.6)	1			
	indicated	43(25.2)	128(74.8)	0.7(0.4-1.2)	0.189		

### Factors Associated with Poor Fetal Outcome

Lack of a delivery plan, which is part of ANC package (OR 1.5; 95% CI 1.0-2.4; p-value 0.040), being single (OR 1.5; 95% CI 1.0-2.4; p-value 0.041) and hypertensive disorders in pregnancy (OR 2; 95% CI 1.1-

4.2; p-value 0.030) showed association with poor fetal outcome. Hypertensive disorders in pregnancy (AOR 2.1; 95% CI 1.0-4.1; p-value 0.045) was significantly associated with poor fetal outcome. (Table 6)

**Table 6: Factors associated with poor fetal outcome**

Variable category		Fetal outcome		Univariate		Multivariate	
		Good n(%)	Poor n(%)	OR(95%CI)	P-value	AOR(95%CI)	P-value
<i>Maternal age</i>	13-15 years	15(46.9)	17(53.1)	1			
	16-17 years	52(46.4)	60(53.6)	1(0.5-2)	0.964		
	18-19 years	109(51.2)	104(48.8)	0.8(0.4-1.8)	0.650		
<i>Residence</i>	Urban	46(46)	54(54)	1			
	rural	130(50.6)	127(49.4)	0.8(0.5-1.3)	0.437		
<i>Marital status</i>	Married	89(55.3)	161(44.7)	<b>1</b>		1	
	Single	87(44.4)	109(55.6)	<b>1.5(1.0-2.4)</b>	<b>0.041</b>	0.7(0.4-1.0)	0.079
<i>Education</i>	Illiterate	33(50.8)	32(49.2)	1			
	Primary level	115(47.7)	126(52.3)	1.1(0.7-2)	0.662		
	Secondary level	28(54.9)	23(45.1)	0.8(0.4-1.8)	0.658		
<i>Occupation</i>	Unemployed	70(48.3)	75(51.7)	1			
	Petty trader/peasants	103(50.0)	103(50)	0.9(0.6-1.4)	0.750		
	Employed	3(50.0)	3(50)	0.9(0.2-4.8)	0.934		
<i>Gravidity</i>	Primegravida	155(49.1)	161(50.9)	1			
	Multivragida	21(51.2)	20(48.8)	0.9(0.5-1.8)	0.794		
<i>ANC visits</i>	No visit	1(25.0)	3(75.0)	1			
	<4 visits	81(47.4)	90(52.6)	0.4(0.04-3.6)	0.394		
	≥4 visits	94(51.7)	88(48.3)	0.3(0.3-3.0)	0.317		
<i>GA at ANC booking</i>	No visit	1(25.0)	3(75.0)	1			
	1 <sup>st</sup> trimester	20(54.1)	17(45.9)	0.3(0.03-3.0)	0.294		
	2 <sup>nd</sup> trimester	141(49.1)	146(50.9)	0.3(0.04-3.4)	0.359		

	3 <sup>rd</sup> trimester	14(48.3)	15(51.7)	0.4(0.03-3.8)	0.396		
<i>ANC medications Or supplements</i>	Not given	3(33.3)	6(66.7)	1			
	All given	47(51.2)	55(58.8)	0.6(0.1-2.5)	0.466		
	Some given	126(46.1)	120(53.9)	0.5(0.1-2.0)	0.302		
<i>Health education ANC</i>	Not provided	55(43.3)	72(56.7)	1			
	Provided	121(52.6)	109(47.4)	0.7(0.4-1.1)	0.093		
<i>Birth preparedness</i>	Not planned	105(45.9)	124(54.1)	1			
	Planned	71(55.5)	57(44.5)	0.7(0.4-1)	0.082		
<i>Delivery plan</i>	Indicated	94(55.0)	77(45.0)	<b>1</b>		1	
	Not indicated	82(44.1)	104(55.9)	<b>1.5(1.0-2.4)</b>	<b>0.040</b>	0.7(0.4-1.5)	0.460
<i>Hypertensive disorders in pregnancy</i>	No	162(51.4)	153(48.6)	1		1	
	Yes	14(33.3)	28(66.7)	2(1.1-4.2)	<b>0.030</b>	2.1(1.0-4.0)	<b>0.045</b>
<i>Maternal anaemia</i>	No	77(53.5)	67(46.5)	1	0.195		
	Yes	99(46.5)	114(53.5)	1.3(0.9-2)			
<i>PROM</i>	No	144(50.4)	142(49.6)	1			
	yes	32(45.1)	39(54.9)	1.2(0.9-2)	0.426		
<i>Chorioamnionitis</i>	No	175(50.1)	174(49.9)	1			
	Yes	1(12.5)	7(87.5)	0.7(0.9-57.8)	0.069		
<i>Mode of delivery</i>	Normal vaginal	33(48.5)	35(51.5)	1			
	Operative	3(50.0)	3(50.0)	0.9(1.2-5)	0.945		
	vaginal	140(49.5)	143(50.5)	1.0(0.6-1.6)	0.889		
	Caesarean section						

## DISCUSSION

In this study most teenagers had normal spontaneous vaginal delivery, some required operative vaginal deliveries and few underwent caesarean section delivery. Successive vaginal delivery in teenagers is due to the better myometrial function, greater connective tissue elasticity and higher cervical compliance in teenage bodies; coupled with high number of low weighted babies, small for gestational age and premature babies, hence relative smaller fetus to the pelvis ratio. Majority of teenagers were between 17-19 years, from rural areas and culturally they are relatively matured than 13-15 years in other studies [3-24]. This is in congruence with the study done in Sri Lanka at Galle teaching hospital in which normal vaginal delivery accounted for 88.4%, instrumental delivery 3.1% and caesarean section 8.4% [20], similar results were seen in studies done in Nigeria and Indonesia [21-25].

More than half of teenagers had anemia of varying degrees which is the common finding in other teenage pregnancy studies [3-24]. This could be due to most teenagers starting ANC in 2<sup>nd</sup> trimester, many had less than 4 visits and they had inadequate hemoglobin level testing and iron supplementation. Increase in iron demand by both the fetus and the growing body of the teenager further increases iron consumption [10], as it has been noted that even in ideal condition teenagers still have risk of developing anemia than the older pregnant women [16].

Hypertensive disorders were also noted in one tenth of teenagers, ranging from gestational hypertension to preeclampsia with severe features, and younger ages have been shown to be at risk similar to other studies [21-

27]. Majority of participants were nulliparous, which is one of notable risk factor for preeclampsia supported by theory of immune system of nulliparous woman [26]. Late antenatal booking and inadequate care enhanced late identification of those at risk, exposing these girls to develop hypertension and complicate to severe pre-eclampsia.

Another poor maternal outcome noted was obstetrics hemorrhage, predominantly postpartum hemorrhage. This was slight higher than studies in Nigeria and Nepal [24, 25]. Notable 28.4% perineal tears and patient anemia in our study could be associated with the higher number of postpartum hemorrhage. An increase in antepartum hemorrhage could be attributed to predisposition of teenagers to placenta abruption as a complication of hypertensive disorders in pregnancy that was notable in this study [10]. Infections of endometrium such as evidenced chorioamnionitis was noted among teenagers who had just delivered, similar to study in India involving three hospitals [28]. This was also noted in Finland, where teenagers were found to have an increased risk of developing chorioamnionitis despite ideal care [16]. In our studies this could be explained by the number of premature rupture of membranes [19.9%] before labor, predisposing these teenagers to ascending vaginal infections [26]. Another possible cause was personal hygiene after delivery, teenagers who did not adequately attend ANC missed health education session.

Majority of the teenagers delivered under a skilled birth attendant, and this led into most babies being born in good health and very few getting still births. This also had an effect to those babies born and needed resuscitation, to recover and be discharged in good health. Number of stillbirth is similar in other studies



2.4% Nepali and the WHO multi country survey of 1.9% stillbirth with 2.1% severe neonatal conditions [3-24].

In this study, approximately 12.9% of newborns had low birth weight, and about one-third were classified as small for gestational age (SGA). These rates were higher than those reported in Nepal (10.5% low birth weight and 18% SGA), and slightly above the WHO multi-country survey, which reported a 12.3% low birth weight rate. These findings may be attributed to the ongoing physical growth demands of the teenage mothers, which compete with fetal development in utero. Additionally, two-thirds of the teenagers in the study were anemic, a condition known to impair fetal growth. The presence of hypertensive disorders likely contributed to placental insufficiency, further restricting intrauterine growth and development.

Premature deliveries in this study were comparable to those reported in Kano, Nigeria [25], and were among the most frequent complications associated with teenage pregnancies. Prematurity significantly contributes to neonatal morbidity and mortality. This outcome is often linked to the biological immaturity of adolescent reproductive organs, particularly reduced cervical compliance. Other contributing factors included high rates of illness during pregnancy and hypertensive disorders, which sometimes necessitated early medical intervention and preterm delivery.

Multivariate analysis of factors associated with poor fetal outcomes among teenage mothers identified hypertensive disorders as an independent predictor. Teenagers with hypertensive conditions were found to be twice as likely to experience adverse fetal outcomes compared to those without such complications. Hypertensive disorders during pregnancy can impair placental blood flow, leading to restricted intrauterine growth. This often results in low birth weight, small for gestational age infants, and, in severe cases, stillbirth. Additionally, conditions like placental abruption—commonly linked to hypertensive disorders—can further increase the risk of stillbirth and necessitate early delivery, contributing to prematurity. These complications collectively accounted for a significant portion of poor fetal outcomes observed in the study [30].

## CONCLUSION AND RECOMMENDATIONS

Maternal outcomes among pregnant teenagers in Mwanza showed a high incidence of anemia, hypertensive disorders, obstetric hemorrhage, premature rupture of membranes, and perineal tears. While most newborns were delivered alive and in good health, a number experienced adverse outcomes such as ICU admission, low birth weight, being small for gestational age, prematurity, and stillbirths. Hypertensive disorders in teenage pregnancies were significantly linked to poor fetal outcomes, highlighting the need for focused interventions and enhanced care to improve both maternal and fetal health.

## Author's Contributions

FN, AK, and RK designed this study. FN collected research data and analyzed and interpreted data. FN, AK and RK prepared the manuscript. AK, AH critically reviewed the manuscript. All authors approved the submission of the manuscript.

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**Availability of Data and Material:** The data set used and analyzed during the current study are available from the corresponding author on request.

## Ethical Approval

Ethical clearance and permission to conduct this study were sought from the joint CUHAS/BMC Research Ethics and Review Committee, and research clearance certificate number CREC/359/2019 was granted. All enrolled study participants voluntarily signed an informed consent to participate in this study after being explained the objectives of the study.

## Consent for Publication

Written informed consent to publish these study findings was obtained from the patients, copies of which are available for review by the Editor-in-chief of this journal. Additionally, consent was sought and granted by the Catholic University of Health and Allied Sciences Directorate of Research and Publication to publish this work. A copy of the clearance document is also available for review by the Editor-in-Chief of this journal.

**Conflict of Interest:** All authors declare that they have no competing interests.

## REFERENCES

1. Blum RW, Gates Sr W. Girlhood not motherhood. Preventing adolescent pregnancy. 2015.
2. WHO. Adolescent pregnancy. Fact sheet Updated January 2018, <http://www.who.int/mediacenter/factsheets/fs364/en/2018>, World Health Organization.
3. Ganchimeg T, Ota E, Morisaki N, Laopaiboon M, Lumbiganon P, Zhang J, et al. Pregnancy and childbirth outcomes among adolescent mothers: a World Health Organization multicountry study. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2014;121:40-8.
4. Patton GC, Coffey C, Sawyer SM, Viner RM, Haller DM, Bose K, et al. Global patterns of mortality in young people: a systematic analysis of population health data. *The Lancet*. 2009;374(9693):881-92.
5. Chandra-Mouli V, Camacho AV, Michaud P-A. WHO guidelines on preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries. *Journal of adolescent health*. 2013;52(5):517-22.

6. Cunningham AJ. What's so bad about teenage pregnancy? *BMJ Sexual & Reproductive Health*. 2001;27(1):36-41.
7. Gilbert W, Jandial D, Field N, Bigelow P, Danielsen B. Birth outcomes in teenage pregnancies. *The journal of maternal-fetal & neonatal medicine*. 2004;16(5):265-70.
8. Vogel JP, Pileggi-Castro C, Chandra-Mouli V, Pileggi VN, Souza JP, Chou D, et al. Millennium Development Goal 5 and adolescents: looking back, moving forward. *Archives of Disease in childhood*. 2015;100(Suppl 1):S43-S7.
9. Huseynov A, Zollikofer CP, Coudyzer W, Gascho D, Kellenberger C, Hinzpeter R, et al. Developmental evidence for obstetric adaptation of the human female pelvis. *Proceedings of the National Academy of Sciences*. 2016;113(19):5227-32.
10. Stevens-Simon C, Beach RK, McGregor JA. Does incomplete growth and development predispose teenagers to preterm delivery? A template for research. *Journal of Perinatology*. 2002;22(4):315.
11. Delpisheh A, Attia E, Drammond S, Brabin BJ. Adolescent smoking in pregnancy and birth outcomes. *The European Journal of Public Health*. 2005;16(2):168-72.
12. Karai A, Gyurkovits Z, Nyári TA, Sári T, Németh G, Orvos H. Adverse perinatal outcome in teenage pregnancies: an analysis of a 5-year period in Southeastern Hungary. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2018:1-4.
13. Wado YD, Sully EA, Mumah JN. Pregnancy and early motherhood among adolescents in five East African countries: a multi-level analysis of risk and protective factors. *BMC pregnancy and childbirth*. 2019;19(1):59.
14. Ministry of Health CD, Gender, Elderly, Children MoH, National Bureau of Statistics, Office of the Chief Government Statistician, ICF. Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) 2015-16. MoHCDGEC, MoH, NBS, OCGS, and ICF Dar es Salaam, Tanzania, and Rockville ...; 2016.
15. Shaikh F, Abbas S, Sultana F, Yousfani S, Hasan T. Adverse Outcome of a Teenage Pregnancy. *J Liaquat Uni Med Health Sci*. 2016;15(04):179-82.
16. Raatikainen K, Heiskanen N, Verkasalo PK, Heinonen S. Good outcome of teenage pregnancies in high-quality maternity care. *The European Journal of Public Health*. 2005;16(2):157-61.
17. Stevens-Simon C, McAnarney ER. Adolescent pregnancy. *Handbook of adolescent health risk behavior*: Springer; 1996. p. 313-32.
18. Stevens-Simon C, McAnarney ER. Adolescent maternal weight gain and low birth weight: a multifactorial model. *The American journal of clinical nutrition*. 1988;47(6):948-53.
19. Stevens-Simon C, McAnarney ER. Skeletal maturity and growth of adolescent mothers: relationship to pregnancy outcome. *Journal of adolescent health*. 1993;14(6):428-32.
20. Goonewardene I, Waduge R. Adverse effects of teenage pregnancy. *Ceylon Medical Journal*. 2009;50(3).
21. Andriyana H, Amelya M, Nababan B, Rusdianto E. Outcome and Risk of Obstetric Complication in Teenage Pregnancy in Tertiary Center Hospital In Indonesia. *KnE Medicine*. 2016;1(1):70-5.
22. Kumar A, Singh T, Basu S, Pandey S, Bhargava V. Outcome of teenage pregnancy. *The Indian Journal of Pediatrics*. 2007;74(10):927-31.
23. Jolly MC, Sebire N, Harris J, Robinson S, Regan L. Obstetric risks of pregnancy in women less than 18 years old. *Obstetrics & Gynecology*. 2000;96(6):962-6.
24. Yadav S, Choudhary D, Narayan K, Mandal RK, Sharma A, Chauhan SS, et al. Adverse reproductive outcomes associated with teenage pregnancy. *McGill Journal of Medicine: MJM*. 2008;11(2):141.
25. Omole-Ohonsi A, Attah R. Obstetric outcome of teenage pregnancy in Kano, North-Western Nigeria. *West African journal of medicine*. 2010;29(5).
26. Cunningham F, Leveno K, Bloom S, Spong CY, Dashe J. *Williams obstetrics*, 24e: McGraw-hill; 2014.
27. Sagili H, Pramya N, Prabhu K, Mascarenhas M, Rani PR. Are teenage pregnancies at high risk? A comparison study in a developing country. *Archives of gynecology and obstetrics*. 2012;285(3):573-7.
28. Shah N, Rohra DK, Shuja S, Liaquat NF, Solangi NA, Kumar K, et al. Comparison of obstetric outcome among teenage and non-teenage mothers from three tertiary care hospitals of Sindh, Pakistan. *JPMA-Journal of the Pakistan Medical Association*. 2011;61(10):963.
29. Martín AR, Jiménez MAR. Epidemiological assessment of the influence of socio-family factors in adolescent pregnancy. *European Journal of epidemiology*. 2001;17(7):653-9.
30. Bokslag A, van Weissenbruch M, Mol BW, de Groot CJ. Preeclampsia; short and long-term consequences for mother and neonate. *Early human development*. 2016;102:47-50.

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