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Original Article

Maternal/caretaker factors associated with preterm births among women at Mubende Regional Referral Hospital. A cross-sectional study.

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Abstract

Background:

Maternal and caretaker factors significantly influence the risk of preterm births. This study aims to assess the maternal/caretaker factors associated with preterm births among women at Mubende Regional Referral Hospital.

Methodology:

A cross-sectional study was conducted among post-delivery mothers at Mubende Regional Referral Hospital. Data were collected using structured questionnaires and a review of maternity records. Data were analyzed using SPSS. A p-value <0.05 was considered statistically significant.

Results:

The study had 90 respondents, 45 (50%) were under 20 years old, while the least number of respondents, 4 (4.4%), were aged 50 and older. Regarding Nutrition during Pregnancy, most of the respondents, 50 (55.6%), had very poor (minimal) food intake, while the least number, 4 (4.4%), reported having a very good (balanced) diet. 48 (53.3%) reported having a shortened cervix, while the least, 12 (13.3%), had no pregnancy-related problems. 49 (54.4%) were exposed to secondhand smoke, while the least, 6 (6.7%), reported having no exposure to risk factors such as alcohol or drugs. 47(52%), got prenatal care but not regularly, while the least, 810(9%), received no care at all.

Conclusion:

The study found that maternal and caretaker factors such as young maternal age, poor nutrition during pregnancy, exposure to secondhand smoke, pregnancy complications like a shortened cervix, and irregular antenatal care attendance were common among women with preterm births at Mubende Regional Referral Hospital.

Recommendations:

Pregnant women should be encouraged to attend antenatal care regularly, maintain proper nutrition, and avoid exposure to harmful substances. Health facilities and community programs should also provide education and support, especially for young mothers, and strengthen early screening for pregnancy complications.

Keywords: *Preterm birth, antenatal care attendance, maternal nutrition, adolescent pregnancy, pregnancy complications, shortened cervix, maternal health, Mubende Regional Referral Hospital.*
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Background of the study

Maternal and caretaker factors play a significant role in determining the risk of preterm births. Research consistently indicates that socio-demographic characteristics, maternal health behaviors, and obstetric history are critical contributors to preterm delivery. For instance, low maternal education has been linked to inadequate knowledge about prenatal care and poor adherence to recommended antenatal visits, increasing the likelihood of preterm birth (Adongo et al., 2023). Similarly, maternal unemployment and low socioeconomic status are associated with increased stress, limited access to nutrition, and reduced healthcare utilization, all of which elevate the risk of preterm deliveries (Rahman et al., 2019; Mabrouk et al., 2022).

Maternal age is another determinant; both adolescent mothers and women above 35 years are at higher risk of preterm labor due to biological and physiological vulnerabilities (Wagura et al., 2018). Furthermore, maternal obstetric history, including previous preterm deliveries, multiple gestations, and complications such as antepartum hemorrhage, significantly influences the likelihood of preterm birth (Adongo et al., 2023; Mboya et al., 2021). Maternal lifestyle factors, such as smoking, alcohol consumption, and poor nutritional status, have also been

associated with increased risk of preterm birth in various settings (Mabrouk et al., 2022).

Understanding maternal and caretaker factors is critical in regions like Mubende, Uganda, where preterm births have been insufficiently studied. By identifying specific maternal characteristics and behaviors linked to preterm delivery, interventions can be designed to target high-risk groups, improve maternal health literacy, and ultimately reduce the incidence of preterm births. This study aims to assess the maternal/caretaker factors associated with preterm births among women at Mubende Regional Referral Hospital.

Methodology

Study Design.

The study used a Descriptive cross-sectional design to collect quantitative data from participants because it was brief and did not require patient monitoring over time.

Study Area.

The study was conducted at Mubende Regional Referral Hospital, a prominent healthcare institution located in Mubende District, Uganda, providing essential medical services to the local community and surrounding regions.

The hospital offers a wide range of healthcare services, including outpatient services, inpatient care, maternity services, surgical operations, pediatric care, and specialized clinics such as HIV/AIDS care, tuberculosis treatment, and more.

Mubende Regional Referral Hospital acts as a referral center for lower-level health facilities, including district hospitals, health center IVs, health center IIIs, and health center IIs within the Mubende region. It provides specialized medical services and care that may not be available at lower-level health facilities. Additionally, the hospital serves as a training site for medical students, interns, nurses, and other healthcare workers. It also participates in public health initiatives and programs, including immunization campaigns, health education, and disease surveillance.

This hospital has a bed capacity of 600 and serves as the Regional Referral Hospital for several districts. The hospital serves as the main referral center for the districts of Mityana, Kiboga, Kyankwanzi, and Kassanda. On average, the hospital attends to approximately 101,000 outpatients and 24,352 inpatients annually.

Study population.

This study involved women of childbearing age with preterm babies attending Mubende Regional Referral Hospital and will include 100 participants who will have provided consent.

Sample size determination.

This will be determined using Kish and Leslie (1965) n = $Z^2pq/d2$

Where,

n- required sample size

z- standard normal deviation set at 95% confidence level, i.e., 1.96

p- percentage picking a choice or response (in this case, taken at 5% = 0.05)

q- 1-p

d- confidence interval (in this case, taken at 0.05 = +-5)

$n = (1{\cdot}96)2 \times 0.05 \times 0.95$

$(0.05)2$

n = 73

Sample technique.

A simple random sampling method was employed to select the study participants at Mubende Regional Referral Hospital. This technique ensures unbiased participant selection, giving each individual an equal opportunity to be included in the study.

Sampling procedure.

The researcher visited the pediatric ward at the Neonatal Intensive Care Unit (NICU) of Mubende Regional Referral Hospital, spoke with the ward in charge about the study topic, and used a simple random sampling technique to create a list of all mothers with preterm babies in the ward. From this list, a sample size of 73 participants was selected by assigning each participant a number and having them choose numbers until the desired number of participants was reached.

Data Collection Method.

The researcher utilized a self-administered questionnaire method and examined the records of premature infants. The questionnaires contained brief multiple-choice inquiries, requiring participants to choose the correct response from predetermined options presented in a structured format.

Data Collection Tools.

Data collection entailed the use of semi-structured self-administered questionnaires containing closed-ended questions specifically aligned with the study's goals. The questionnaires were carefully crafted in simple and understandable language for literate mothers. Participants who have difficulty reading and writing will receive assistance through a researcher-guided questionnaire interview.

Data Collection Procedure.

The researcher received an introductory letter from the research committee of Mildmay Institute of Health Sciences to present to the hospital director at Mubende Regional Referral Hospital, seeking permission to access the NICU under the pediatric ward. Through the director's assistance, the head of the NICU will help identify preterm babies and

their mothers or caretakers for the study. All volunteers will be approached for informed consent, allowing them to sign consent forms voluntarily and withdraw from the research at any point. To maintain confidentiality, unique codes will be assigned to participants' information, known only to the researcher, respondents, and the medical team involved in their care.

The data gathering procedure consisted of distributing self-administered questionnaires that must be completed in full. Participants who are unable to read or write will receive assistance from research assistants to mark their responses. Following the completion of the questionnaires, participants will be able to ask any pertinent questions about the study, and researchers will provide answers. Researchers have the option to withdraw from the study if desired. This methodical approach is designed to collect valuable data while upholding participants' rights and maintaining confidentiality throughout the research.

Quality control.

Piloting the study.

Before commencing the actual research, the researcher conducted a preliminary study at Mubende Regional Referral Hospital to secure permission from the hospital administration and ensure that the conditions within the facility had remained unchanged. Additionally, this pilot study will help to eliminate any concerns regarding the presence of highly contagious diseases that could impede the research process.

Pre-testing of the study tool.

A small percentage of my estimated study population of 10 people at Mubende Regional Referral Hospital will use the questionnaires before actual data collection and modify them before actual data collection so as to determine if the information collected will be reliable and valid.

All caretakers of children below five years who have consented and who have picked the cardboard X were included in the study.

Inclusion criterion

All mothers or caretakers of preterm babies have consented and are willing to participate in the study.

Exclusion criterion

Mothers or caretakers of preterm babies who were not available during the data collection

Data Analysis and Presentation.

The data analysis involved manual entry on statistical tally sheets, followed by input into a computer using Microsoft Excel software. The findings will be presented in a quantitative format, utilizing pie charts, bar graphs, and frequency distribution tables, accompanied by explanations for clear interpretation.

Data Management.

The data was recorded in notebooks using a pen and transferred to a computer for safe storage. Furthermore, a copy of the data will be saved on a flash drive to prevent any possible loss, and questionnaires were securely stored under lock and key to uphold confidentiality and privacy.

Ethical Consideration.

The Dean of the School of Clinical Officers provided a letter of introduction to the medical superintendent at Mubende Regional Referral Hospital, who will then facilitate my introduction to the head of the Neonatal Intensive Care Unit (NICU) in the pediatric ward.

The person in charge of NICU introduced the mothers or caretakers of the preterm babies and briefed them about the consent form, and also substantiated the privacy and confidentiality of their information to them. I then hand them questionnaires where they will be required to answer them at ease.

Results

There was a total of 90 mothers, all of whom took part in the study. A total of 90 questionnaires were distributed, and the same number were received and analyzed.

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Maternal/caretaker factors associated with the preterm births.

Table 1: Showing factors associated with preterm births

VARIABLE	FREQUENCY (N)	PERCENTAGE (%)
AGE DURING PREGNANCY		
a) 1. Under 20	45	50
b) 2. 20-34	35	38.9
c) 3. 35-49	6	6.7
d) 4. 50 and older	4	4.4
TOTAL	**90**	**100**
NUTRITION DURING PREGNANCY		
a) 1. Very good (balanced diet)	4	4.4
b) 2. Good (mostly balanced)	6	6.7
c) 3. Poor (unbalanced)	30	33.3
d) 4. Very poor (minimal food)	50	55.6
TOTAL	**90**	**100**
PROBLEMS DURING PREGNANCY		
a) 1. Previous preterm birth	14	15.6
b) 2. Shortened cervix	48	53.3
c) 3. Other problems	16	17.8
d) 4. No problems	12	13.3
TOTAL	90	100
EXPOSURE TO RISK FACTORS		
a) 1. Secondhand smoke	49	54.4
b) 2. Alcohol	26	28.9
c) 3. Illegal drugs	9	10
d) 4. None of these	6	6.7
TOTAL	90	100

Table 1, regarding Age during Pregnancy, about half of the respondents, 45 (50%), were under 20 years old, while the least number of respondents, 4 (4.4%), were aged 50 and older. Regarding Nutrition during Pregnancy, most of the respondents, 50 (55.6%), had very poor (minimal) food intake, while the least number, 4 (4.4%), reported having a very good (balanced) diet.

In terms of Problems during Pregnancy, more than half of the respondents, 48 (53.3%), reported having a shortened cervix, while the least, 12 (13.3%), had no pregnancy-related problems.

With respect to Exposure to Risk Factors, most of the respondents, 49 (54.4%), were exposed to secondhand smoke, while the least, 6 (6.7%), reported having no exposure to risk factors such as alcohol or drugs.

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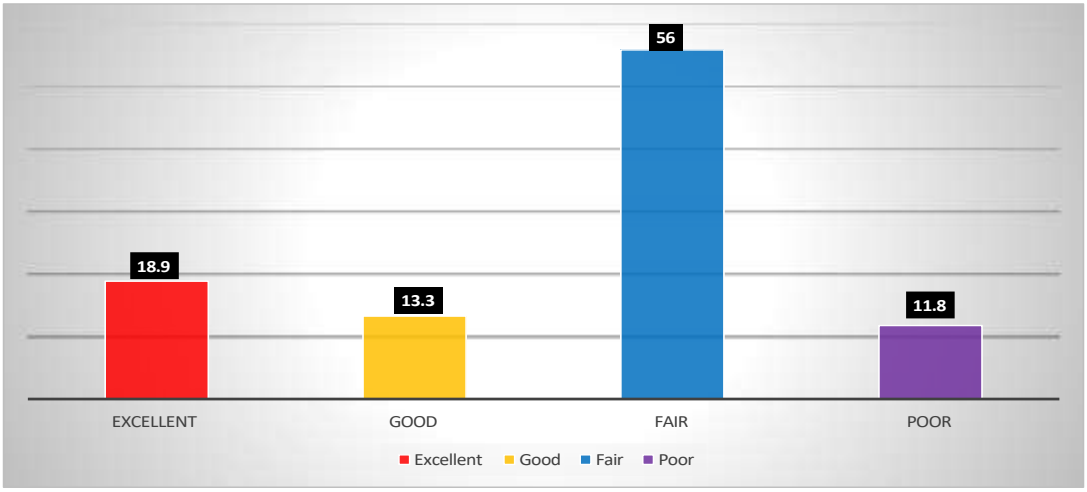
Figure 1: How was your health before and during your pregnancy

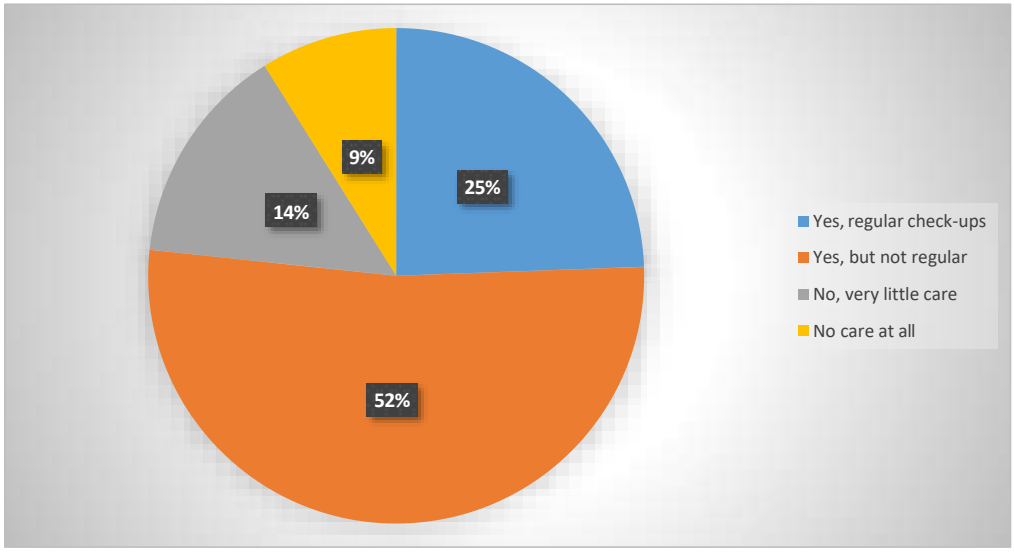
(n=90)



In Figure 1, half of the respondents' health 50(56%) was fair, while the least 11(11%) of the respondents' health was poor

Figure 2: Did you get enough prenatal care during your pregnancy

(n=90)



In Figure 2, more than half of respondents, 47(52%), got prenatal care but not regularly, while the least, 810(9%), received no care at all.

Discussion

Maternal/caretaker-associated factors associated with preterm births

Age has long been recognized as a key determinant in preterm birth risk, with the study revealing that 50% of respondents were under the age of 20, while 4.4% were aged 50 and older. Maternal age is often divided into two high-risk groups: younger women (under 20) and older women (over 35). The younger age group, especially teenagers, faces higher risks due to factors such as physical immaturity, inadequate prenatal care, and a higher likelihood of unhealthy behaviors (such as smoking or poor nutrition) that

increase the risk of preterm labor. This aligns with previous studies, including that of Morukileng (2021), which found that young maternal age is a significant risk factor for preterm births.

In terms of nutrition, a significant portion of the participants (55.6%) reported very poor nutritional intake during pregnancy. This finding is consistent with studies like those by Nsereko et al. (2020), which indicate that poor maternal nutrition, including insufficient dietary diversity and caloric intake, increases the likelihood of preterm birth. Inadequate nutrition during pregnancy is linked to poor fetal development, low birth weight, and preterm labor. Given that maternal malnutrition compromises both the mother's health and fetal growth, the study calls for urgent interventions to ensure that women, especially those from lower socio-economic backgrounds, receive proper dietary guidance and supplementation during pregnancy.

The study also revealed that a substantial proportion of respondents (53.3%) experienced problems such as a shortened cervix, a well-established risk factor for preterm birth. Previous preterm birth, identified in 15.6% of the cases, is another significant risk factor that has been supported in the literature (ACOG, 2024). Women with a history of preterm birth are at higher risk of experiencing the same outcome in subsequent pregnancies due to cervical insufficiency, uterine abnormalities, or other complications. These findings highlight the need for targeted care and close monitoring of women with a history of preterm births or cervical insufficiency to prevent recurrence.

Exposure to environmental and lifestyle factors, including secondhand smoke (54.4%) and alcohol use (28.9%), also emerged as significant contributors to preterm birth in this study. This aligns with the findings of Morukileng (2021), who noted that maternal smoking and alcohol consumption during pregnancy are associated with higher rates of preterm labor due to the negative effects these substances have on placental function, fetal oxygenation, and uterine contractility. These results suggest the necessity of public health interventions aimed at reducing smoking and alcohol consumption among pregnant women, as well as increasing awareness of the associated risks of preterm birth.

Other factors, such as income and education, also influenced healthcare access and the likelihood of preterm birth. More than half (53%) of the respondents were aware that social factors impacted their healthcare during pregnancy. This awareness aligns with the findings of the March of Dimes (2022), which emphasized the role of social determinants such as income, education, and access to healthcare in shaping maternal health outcomes. Women with lower income and education levels are less likely to receive adequate prenatal care, which can lead to higher risks of complications such as preterm birth. The study's findings support the need for social interventions to address these disparities and ensure that all women have access to the resources they need for a healthy pregnancy.

Additionally, lifestyle factors such as exposure to secondhand smoke and alcohol were prevalent in the study. More than half of the respondents (54.4%) were exposed to secondhand smoke, and 28.9% used alcohol during pregnancy. These factors are widely recognized as contributing to preterm birth, as smoking and alcohol consumption can impair placental function, reduce fetal oxygen supply, and increase the likelihood of premature labor (Morukileng, 2021). The study highlights the need for public health campaigns that target these behaviors and promote healthier lifestyles during pregnancy.

Despite the clear association between these maternal and caretaker factors and preterm birth, the study also found that a significant proportion of respondents (52.2%) did not receive adequate prenatal care, with 51.1% starting care after 12 weeks of pregnancy. Inadequate early prenatal care has been identified as a major determinant of preterm birth (UNIPH, 2024). Early and regular antenatal visits are essential for detecting risk factors such as hypertension, infections, or preeclampsia that could lead to preterm birth. The findings underscore the need to prioritize early initiation of antenatal care and consistent monitoring of pregnant women, especially those with identified risk factors.

Additionally, the findings indicate a poor nutritional status, with 55.6% of respondents reporting very poor food intake, which supports the conclusions of previous studies that link maternal malnutrition with increased rates of preterm birth (Tibaijuka et al., 2021). Addressing this issue requires a multifaceted approach, including public health campaigns to educate expectant mothers on the importance of a balanced diet, access to nutritional supplements, and improved food security in rural areas. This could significantly reduce the risk of preterm birth and associated complications.

Conclusion

The study identified several maternal and caretaker factors associated with preterm births among women at Mubende Regional Referral Hospital. A large proportion of respondents were young mothers below 20 years, indicating that maternal age may contribute to the risk of preterm delivery. Poor maternal nutrition was also common, with more than half of the respondents reporting very poor food intake during pregnancy, which can negatively affect fetal growth and pregnancy outcomes. In addition, many mothers experienced pregnancy-related complications such as a shortened cervix and were exposed to risk factors like secondhand smoke. Although most mothers attended prenatal care, many did not do so regularly, which may reduce the effectiveness of antenatal interventions aimed at preventing preterm births. These findings highlight the importance of addressing maternal health behaviors and improving access to consistent antenatal care to reduce the incidence of preterm births.

Recommendations

Strengthen antenatal care services: Health workers at Mubende Regional Referral Hospital should encourage pregnant women to attend antenatal care regularly to enable early detection and management of pregnancy complications associated with preterm births.

Promote maternal nutrition education: The hospital and community health workers should provide continuous education on proper nutrition during pregnancy to improve maternal health and reduce the risk of premature delivery.

Community awareness on risk factors: Public health programs should educate families and communities about the dangers of secondhand smoke, alcohol, and drug exposure during pregnancy.

Support for adolescent mothers: Special maternal health programs should be developed to support young mothers, particularly those under 20 years, through counseling, reproductive health education, and closer antenatal follow-up.

Acknowledgement

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Lastly, I appreciate my family, classmates, and friends for their support, encouragement, and understanding throughout this journey.

List of Abbreviations

MOH:	Ministry of Health
NGO:	Non-Governmental Organization
OR:	Odds Ratio
WHO:	World Health Organization
NICU:	Neonatal Intensive Care Unit
LBW:	Low Birth Weight
BMI:	Body Mass Index

Source of funding

The study did not receive any external funding.

Conflict of interest

The author did not declare any conflict of interest.

Author contributions:

Malcolm Batte was the principal investigator
James Kizito supervised the research project
Hasifa Nansereko supervised the research project
Jane Frank Nalubega supervised the research project
Francisco Ssemuwemba supervised the research project

Data availability

The data is available upon request.

Informed consent

All the respondents consented to this study.

Author Biography

Malcolm Batte holds a Diploma in Clinical Medicine and Community Health from Mildmay Institute of Health Sciences.

James Kizito is a tutor at Mildmay Institute of Health Sciences.

Francisco Ssemuwemba is the dean of the School of Allied Health at Mildmay Institute of Health Sciences.

Hasifah Nansereko is the chairperson of the Institutional Review Council (IRC) at Mildmay Institute of Health Sciences.

Jane Frank Nalubega is a tutor at Mildmay Institute of Health Sciences.

Immaculate Prsoperia Naggulu is a tutor at Mildmay Institute of Health Sciences.

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