Assessing the Prevalence and Associated Determinants of Prematurity and Pediatric Malnutrition in Lesotho

Samantha Marosio and Denice Arnold, Columbia University VP&S, Class of 2023
Mentors: Lawrence Stanberry, MD, PhD, Kim Hekimian, PhD, Richard Polin, PhD

Research Question: What is the prevalence of premature birth and pediatric malnutrition in Queen 'Mamohato Memorial Hospital in Lesotho and what are the associated environmental and pathological factors?

BACKGROUND

Preterm birth, defined as birth before 37 weeks gestation, and pediatric malnutrition are major contributors of neonatal and infant morbidity and mortality worldwide. In 2017, Lesotho's leading cause of neonatal death was preterm birth complications and the country's preterm birth rate is 12% (1). Stunting rates (one measure of malnutrition) of children under 5 years of age in Lesotho are also high at 33% (2), and contribute to the poor health outcomes of many of the children hospitalized at Queen 'Mamohato Memorial Hospital.

QUEEN 'MAMOHATO HOSPITAL

Queen 'Mamohato Memorial Hospital, recently opened in 2011, primarily serves the patients from the Maseru district of Lesotho and surrounding areas. Although the hospital has been recording medical data electronically since its inception, there has been no formal analysis of the associated determinants of prematurity and pediatric malnutrition at this hospital. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho.

Inception, there has been no formal analysis of the associated determinants of prematurity and pediatric malnutrition at this hospital. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho. The goal is to provide informed recommendations for how this facility can appropriately address and potentially reduce these outcomes and their associated determinants of prematurity and pediatric malnutrition in Lesotho.

METHODS

A review of the literature was performed and experts in the field were consulted to determine the variables needed to assess both prevalence and potential risk factors for malnutrition and preterm birth. We aim to conduct facility-based cross sectional studies that include a retrospective chart review of births and children under 5 admitted at this hospital from 2015 to 2020. For the nutritional assessment, proposed variables for the study include anthropometric measures, biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data. For the prematurity assessment, variables include fetal factors (e.g. intraventricular hemorrhage, retinopathy of prematurity), maternal factors (age, number of antenatal visits, parity, COVID-19 status), and environmental factors (environmental temperature, newborn thermal care practices).

RESULTS

IRB protocols were prepared and submitted and the survey tools that identify pertinent data to be collected were sent to stakeholders in Lesotho for review. Due to the COVID-19 pandemic, data collection has not yet begun.

DISCUSSION

Assessing the prevalence of acute/chronic malnutrition and preterm birth and its determinants may inform future quality improvement programs. One possible program could be the implementation of screening tests for malnutrition at Queen Mamohato Memorial Hospital which may help assess a patient’s risk of malnutrition, guide hospital treatments, and plan for follow-up after discharge.

REFERENCES

6. Olusanya BO, Ofovwe GE. Predictors of preterm births and low birthweight in an inner-city hospital in sub-Saharan Africa [published online August 2020].

Table 1. Measures and factors contributing to nutritional status in children under 5 years of age

<table>
<thead>
<tr>
<th>City, Country of Hospital</th>
<th>Study Type</th>
<th>Total N</th>
<th>Prevalence of Preterm Birth</th>
<th>Significant Associated Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kageri and Addi, Ethiopia³</td>
<td>Cross sectional</td>
<td>472</td>
<td>13.3%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Togo, Nigeria⁴</td>
<td>Retrospective review</td>
<td>1,750</td>
<td>16.9%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Gonder town, Ethiopia⁴</td>
<td>Cross sectional</td>
<td>540</td>
<td>4.4%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Tori, Nigeria⁵</td>
<td>Cohort study</td>
<td>2,485</td>
<td>12.0%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Lagos, Nigeria⁶</td>
<td>Cross sectional</td>
<td>6,314</td>
<td>19.9%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Lagos, Nigeria⁶</td>
<td>Cross sectional</td>
<td>5,263</td>
<td>16.8%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Majaw,⁷</td>
<td>Cross sectional</td>
<td>2,149</td>
<td>16.3%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
<tr>
<td>Navi, Kenya⁸</td>
<td>Cross sectional</td>
<td>322</td>
<td>18.3%</td>
<td>Birth weight, gestational age, maternal age, parity, maternal education, maternal health, maternal history of preterm birth, maternal history of preeclampsia, maternal smoking, maternal drinking, maternal malnutrition, maternal anemia, maternal blood pressure, maternal body mass index, maternal age, maternal education, maternal employment, maternal income, maternal health care utilization, maternal socio-economic status, maternal nutritional status, maternal anthropometric measures, maternal biomarkers for blood (e.g. anemia) and stool (parasites), nutrition screening questions, and demographic data.</td>
</tr>
</tbody>
</table>

Table 2. Prevalence and associated factors of preterm birth as determined by similar, previous studies