**ABSTRACT**

Child malnutrition has been a public health concern particularly in low-income countries like Malawi. While maternal empowerment has been recognized as a critical factor in child nutrition outcomes, the need to examine other multifaceted influences on child malnutrition cannot be overstated. Using the 2015-16 Malawi Demographic Health Survey, a Multiple Indicator Multiple Causal Model was used to assess multifactual influences on child malnutrition in terms of stunting, wasting and underweight followed by a decomposition approach in this study. The variables of interest in this study were categorized into maternal factors, child factors, household factors and community factors as show in table 1:

Table 1: Variables used in the study

Dependent variable: Child malnutrition in terms of stunting, wasting and underweight

| Independent variables | Description | Measure/coding |
|---|---|---|
| **Maternal factors** | | |
| 1.Maternal nutrition knowledge and practice | Whether the child was given colostrum three days after birth | Yes (1)/no (0) |
| | Whether the mother heard of the importance of family planning | Yes (1)/no (0) |
| | Whether the mother heard about the use of Oral Rehydration Salts to treat diarrhea | Yes (1)/no (0) |
| | Whether the child was given food belonging to six food groups using a 24hour recall period | Yes (1)/no (0) |
| | Under-five child feeding times | 1 if less than three, 2 if more than three times |
| | Exclusive breastfeeding | 1 if the child was exclusively breastfed, 2 if not exclusively breastfed |
| 2.Maternal social empowerment | who usually decides on visits to family or relatives | 1 if mother is involved, otherwise 2 |
| | who usually decides on respondent's health care | 1 if mother is involved, otherwise 2 |
| | Permission to seek medical help | 1 big problem, 2 not a big problem |
| **Maternal economic empowerment** | | |
| Productive asset ownership | Agricultural land | 0 if No ownership<br>1 if Single ownership<br>2 if Joint ownership<br>3 if both single and joint ownership |
| | House | 0 if No ownership<br>1 if Single ownership<br>2 if Joint ownership<br>3 if both single and joint ownership |

| | | |
|---|---|---|
| Savings account ownership | Own a savings account | Yes (1)/No (0) |
| Decision regarding | Large household purchases<br>Own income | Involved(1)/Not involved(0) |
| Medical financial support | Getting money for medication | Big problem/ Not a big problem |
| **Other maternal factors** | | |
| Age | 15-24 | 1 |
| | 25-34 | 2 |
| | 35-49 | 3 |
| Marital status | | |
| | Married | 1 |
| | Not married | 0 |
| Maternal occupation | None | 1 |
| | Non agricultural | 2 |
| | Agricultural | 3 |
| Maternal education | | |
| | None | 0 |
| | Primary | 1 |
| | Secondary | 2 |
| | Higher | 3 |
| Maternal BMI | | |
| | Normal BMI | 1 |
| | Underweight | 2 |
| | Overweight | 3 |
| **Child factors** | | |
| Child age | 0-23 months | 1 |
| | 24-35 months | 2 |
| | 36-59 months | 3 |
| Sex | Male | 1 |
| | Female | 2 |
| Birth order | 1 | 1 |
| | 2 or 3 | 2 |
| | 4 and above | 3 |
| Twin status | Yes | 1 |
| | No | 2 |
| **Household factors** | | |
| 1.Household size | Less than 4 | 1 |
| | 5 – 6 members | 2 |
| | 7 and above | 3 |
| 2.Age of household head | 16-24 years | 1 |
| | 25-34 years | 2 |
| | 35-54 years | 3 |
| | 55-98 years | 4 |
| 3.Gender of household head | Male | 1 |
| | Female | 2 |
| 4.Household wealth status | Poor | 1 |
| | Medium | 2 |
| | Rich | 3 |
| 5.Religion | Christians | 1 |
| | Muslims | 2 |
| | No religion | 3 |

| | | |
|---|---|---|
| **Community factors** | | |
| 1.Distance to the nearest health center | A big problem<br>Not a big problem | 1<br>2 |
| 2. Attended antenatal clinic | Never<br>Less than adequate<br>Adequate | 0<br>1<br>2 |
| 3.Place of residence | Urban<br>Rural | 1<br>2 |
| 4.Sanitation | Shared<br>Private | 0<br>1 |
| 5.Watersource | Unsafe<br>Safe | 0<br>1 |

Following a multivariate analysis, the study found no full effect of maternal empowerment factors on under-five child malnutrition across all indicators. However, increasing maternal nutritional knowledge of colostrum, feeding times and economic empowerment was observed to have a potential of reducing stunting and underweight in under-children. Other factors that had a partial effect on child malnutrition indicators were maternal education, child twin status, child age, maternal Body Mass Index as well as household wealth status.

A further analysis through decomposition found that child stunting was dominantly affected by maternal education which had high contribution coefficient as shown in table 2, child age had a dominant contribution to wasting (as shown in table 3) and that maternal nutritional knowledge which had a dominant contribution to child underweight in Malawi as shown in table 4.

Table 2: Variable contribution to stunting

| variable | Mean | Marginal effects | CI | contr | contr% | Rank |
|---|---|---|---|---|---|---|
| Maternal education | 0.1217808 | -0.0785447 | -0.2057 | 0.003017367 | 38.77949 | 1 |
| Maternal age | 0.36155 | -0.0541899 | -0.06795 | 0.002041498 | 26.23754 | 2 |
| Maternal BMI | 0.7534438 | 0.029209824 | 0.02921 | 0.000985838 | 12.67009 | 3 |

As shown in table 2, Maternal education is the most influential factor, contributing 38.78% to the variability in haz.

### 4.5.2.2 Contribution to wasting

For wasting in table 3, Child age is identified as the most influential factor contributing to wasting, with a contribution of 93.12%. This indicates that younger children are 93.12% likely to be wasted, emphasizing the critical importance of addressing wasting during early childhood and implementing timely interventions to support healthy growth and development.

Table 3: Variable contribution to wasting

| variable | Mean | Marginal effects | CI | contr | contr % | Rank |
|---|---|---|---|---|---|---|
| Child age | 0.89459 | -0.0170249 | -0.01022 | 0.004874967 | 93.12306 | 1 |
| Maternal economic empowerment | 0.36115 | -0.005427 | -0.04869 | 0.00298875 | 7.092 | 2 |
| household size | 0.36155 | -0.0068273 | 0.034004 | -0.00262874 | 0.2151 | 3 |

### 4.5.2.3 Contribution to underweight

Referring to underweight in table 4, maternal nutritional knowledge of feeding times had a highest contribution percentage,84.5% indicating its significant influence on waz.

Table 4. 1: Variable contribution to underweight

| variable | Mean | Marginal effects | CI | contr | contr% | |
|---|---|---|---|---|---|---|
| Maternal nutritional knowledge of feeding times | 0.8945897 | 0.034169 | -0.20570056 | -0.00713 | 84.5289 | 1 |
| Maternal nutritional knowledge of colostrum | 0.3611499 | 0.024883 | -0.06794639 | -0.00069 | 8.208537 | 2 |
| Child Sex | 0.4965063 | 0.019738 | -0.06794639 | -0.00076 | 8.951846 | 3 |

The study recommends that it is important to promote maternal formal education and maternal nutritional knowledge when considering programs to reduce child malnutrition. These can be through implementing a community-based nutrition education program that offers workshops and training sessions for expectant and new mothers on optimal feeding practices, early childhood nutrition, and health-promoting behaviors. It is also important to consider targeted interventions considering that children below 2 are likely to suffer from malnutrition compared to the other age brackets.