

Prevalence and factors associated with double and triple burden of malnutrition among mothers and children in Nepal: evidence from 2016 Nepal Demographic and Health Survey

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Background

- The different forms of malnutrition among children and mothers are major public health challenges in low and middle-income countries [1]. Multiple forms of malnutrition consist of double and triple burden of malnutrition.
- The double burden of malnutrition (DBM) is defined as the coexistence of maternal overweight/ obesity along with child undernutrition within the same household level [2, 3].
- In previous studies, the triple burden of malnutrition referred to the coexistence of overnutrition, undernutrition and micronutrient deficiencies [4, 5]
- Although undernutrition among children has been gradually decreasing, the coexistence of different forms of malnutrition among mothers and children has continued to rise globally.
- To our knowledge, overnutrition, undernutrition and micronutrient deficiencies in mother-child pairs within the same household has not been explored using nationally representative data in Nepal so far.

Aims

To explore the prevalence and factors associated with the double and triple burden of malnutrition among mother-child pairs in Nepal.

Methods

- A total sample of 2,261 mother-child pairs from the Nepal Demographic and Health Survey (NDHS) 2016, a nationally representative cross-sectional survey was included in the study.
- Anthropometric and biochemical indices such as height-for-age, weight-for-height, and weight-for-age and hemoglobin levels to evaluate the nutritional status of 0-59 months child.
- We used body mass index (BMI) classification according to WHO for mothers aged 15-49 years
- We dichotomized all dependent variables into presence (coded 1) versus absence (coded 0).
- Overweight/obesity mother and undernourished child (stunting or wasting or underweight) which was considered as the double burden of malnutrition (DBM)
- Double burden of malnutrition plus anemic child (DBM + anemia) was regarded as the triple burden of malnutrition (TBM).
- The bivariate and multivariable logistic regression were performed to assess the factors associated with the double burden of malnutrition (DBM) and the triple burden of malnutrition (TBM).
- Data were analyzed using STATA/MP version 14.1 (StataCorp LP, College Station, Texas)
- The presence of multicollinearity was checked among independent variables using variance inflation factor (VIF) at cut off value of 10.

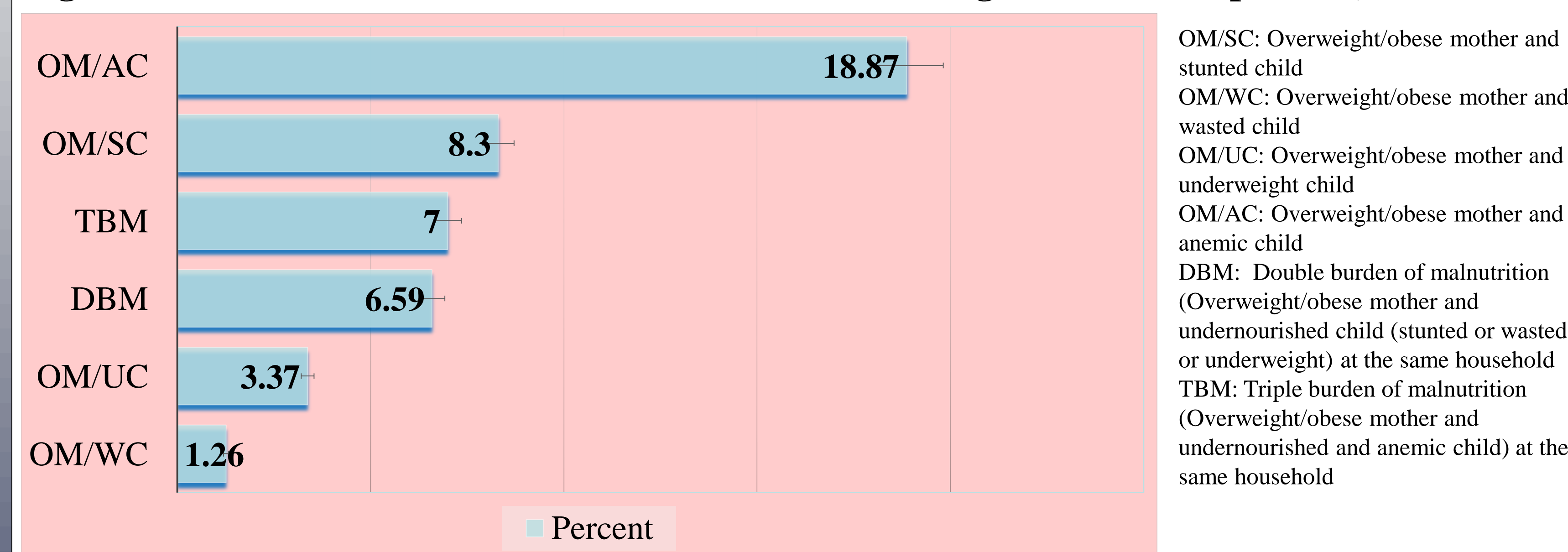
Results

Table 1 Bivariate and multivariable analysis of double and triple burden of malnutrition among mother-child pairs and its associated factors (n=2,261).

Variables	DBM		TBM	
	cOR(95% CI)	aOR(95% CI)	cOR(95% CI)	aOR(95% CI)
Maternal factors				
Age group				
15-24	1	1	1	1
25-34	1.61(0.87-2.98)	1.59(0.83-3.03)	1.64(0.88-3.08)	1.96(1.04-3.71)*
≥35	2.59(1.13-5.94)**	3.08(1.20-7.86)**	3.11(1.34-7.22)**	3.41(1.26-9.17)**
Province				
Province 1	0.89(0.40-2.00)	1.20(0.50-2.85)	0.89(0.38-2.03)	1.08(0.47-2.49)
Province 2	0.08(0.02-0.29)***	0.13(0.03-0.47)***	0.10(0.03-0.33)***	0.11(0.03-0.41)***
Province 3	1	1	1	1
Province 4	0.73(0.31-1.71)	0.97(0.36-2.61)	0.71(0.29-1.70)	0.85(0.31-2.32)
Province 5	0.51(0.21-1.22)	0.65(0.25-1.72)	0.57(0.23-1.38)	0.65(0.27-1.59)
Province 6	0.24(0.07-.75)*	0.47(0.14-1.58)	0.28(0.09-0.87)*	0.50(0.15-1.67)
Province 7	0.13(0.04-0.41)***	0.24(0.07-0.86)*	0.14(0.04-0.45)***	0.23(0.06-0.82)*
Education				
No education	1	1	1	1
Primary	1.14(0.55-2.34)	1.04(0.49-2.22)	1.09(0.53-2.27)	1.06(0.46-2.41)
Secondary	2.43(1.24-4.76)*	2.05(1.03-4.07)*	2.09(1.05-4.16)*	2.05(1.00-4.18)*
higher	1.83(0.81-4.10)	1.04(0.43-2.49)	1.57(0.67-3.71)	1.43(0.53-3.84)
Wealth status				
Poor	1	1	1	1
Middle	1.15(0.48-2.75)	1.42(0.54-3.71)	0.98(0.38-2.49)	1.61(0.58-4.40)
Rich	2.89(1.50-5.54)***	2.46(1.17-5.15)**	2.61(1.36-5.02)***	2.66(1.28-5.54)***
Height				
Normal height	1	1	1	1
Short stature	3.19(1.59-6.39)***	4.18(2.04-8.52)***	4.38(2.17-8.86)***	5.01(2.45-10.24)***

DBM: Double burden of malnutrition (Overweight/obese mother and undernourished child at the same household), TBM: Triple burden of malnutrition (Overweight/obese mother and undernourished and anemic child at the same household), 1: reference category, COR: crude odds ratio, AOR: adjusted odds ratio, *p < 0.05, **p < 0.02, ***p < 0.001

Fig. 1 Prevalence of different forms of malnutrition among mother-child pairs (2,261)



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Key findings

- Prevalence of DBM and TBM was 6.60(5.13-8.84) % and 7(5.42-8.99) % respectively in the same household.
- In the adjusted multivariable logistic regression, mothers with short stature compared to normal height (AOR=4.18, 95% CI: 2.04-8.52), from the richest wealth status compared to poor wealth status (AOR=2.46, 95% CI= 1.17-5.15), from age group of above 35 years compared to 15-24 years (AOR=3.08, 95% CI:1.20-7.86), and those who had attended at least a secondary level of education compared to no education (AOR=2.05, 95% CI: 1.03-4.07) were more likely to suffer from the DBM.
- Similarly, mothers with short stature compared to normal height (AOR=5.01, 95% CI:2.45-10.24), from the richest wealth status compared to poor wealth status (AOR=2.66, 95% CI=1.28-5.54), age groups of above 35 years compared to 15-24 years (AOR=3.41, 95% CI:1.26-9.17), and those who had attended at least a secondary level of education compared to no education (AOR=2.05, 95% CI: 1.00-4.18) were more likely to suffer from the TBM.

Conclusions

There is a low prevalence of double and triple burden of malnutrition among mother-child pairs in Nepal. Mothers with short stature, belonging to the richest family and in older age were more prone to double and triple burden of malnutrition

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Acknowledgments

We would like to thank the DHS program, ICF international for providing us the NDHS 2016 data set for analysis.