

# Factors Associated to Abnormal Nutritional Status of Children: A Survey from Clinics in Ho Chi Minh City, Vietnam

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## ABSTRACT

**Background:** In Vietnam, the horror and mortality of mother and child, whether legitimately or through the back door, is represented by traditions that predominate in the general public. Practices for supporting and educating infants fluctuate according to networks, depending on social tradition. The main objectives of this study were to investigate the situation when rearing and nurturing children and to explore the associated factors that affected to nutritional status of the children.

**Methods:** A cross-sectional survey-based study conducted between September 2018 to April 2019 in ten obstetrics and gynecology clinics located in Ho Chi Minh City. Mothers were chosen if they have at least one child that at the age of 36 months or higher. Children body mass index (BMI) was calculated and assessed by using BMI-for-age-and-gender quantile. Logistic regression was performed where dependent variable was a discrete variable including normal and abnormal nutrition status.

**Results:** The average age of the mothers was 29.4±4.6 years and the average age of the child was 24.1±5.7 months. Over half of the mothers maintain breastfeeding (50.6%). Child whose mothers lived in the rural area had 3.76 times higher risks to be under- or overweight, compared to those lived in rural regions (p=0.009). Child whose mother were well-

educated was had a lower risk of abnormal nutritional status. Compared to those who earned high income, mothers earned low income had higher risks to have abnormal-nutritional-status children. Children who were breast-fed till 36 months old had the lower risks to be under- or overweight than the counterparts.

**Conclusion:** The risks of children to be under- or overweight was positively affected by rural area, lower educated, low monthly income and was negative affected by the middle expenditure for child and breastfeeding till 36 months old.

**Keywords:** Breastfeeding, Childcare, Neonatal rearing, Practice, Vietnam.

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## INTRODUCTION

What and how the newborns are fed plays important role for their health, evenly causing long-term consequence. The mothers who do not breastfeed are more likely to develop unhealthy conditions, including breast cancer.<sup>1</sup> Well-evaluated clinical trials conducted in industrial countries proved the negative outcomes on children without being breastfed. They are more likely to get gastrointestinal infection, otitis media, lower respiratory tract infection, and necrotizing enterocolitis.<sup>2-8</sup>

To be considered as a most natural food for newborns, the benefits of breastfeeding continuously appear from neonates to the early stage of childhood, and even to the adulthood. Breastfeeding promotes children's safety, wellness, and growth. From 2009, there has been a recommendation from World Health Organization (WHO) and United Nations Children's Fund (UNICEF) that newborns should get exclusive breastfeeding during the first 6 months of life and continued breastfeeding until two years old.<sup>9</sup>

Despite the importance of breastfeeding on babies, the breastfeeding level generally remains low worldwide recently. Just 43 percent of the world's newborns breastfeed within one hour of conception and 40 percent of children aged six months or younger breastfeed.<sup>10</sup> During the 20<sup>th</sup> century, breastfeeding became less common not only in high income countries,<sup>11</sup> but in low- and middle-income countries on urban mothers with higher education and socioeconomic status.<sup>12, 13</sup> Breast milk replacements were viewed as new and glamorous, and breastfeeding was related to bad and unskilled breastfeeding.<sup>14</sup>

The downward trend of breastfeeding affects negatively on infant health. Including excessive weight gain correlated with the possibility of subsequent obesity during infancy and early childhood and also early deaths.<sup>15</sup> In particular, kids from low socioeconomic households are more likely to gain excessive weight and therefore maintain their poor health outcomes during their adulthood.<sup>16, 17</sup> On the other hand, breastfeeding have been proved to an intervention that could protect the children from developing overweight or obese (24–29).<sup>18-23</sup> Yet, the very children that need this protection the most are also the least likely to be breastfed. However, it is disappointed that the children who are the most in need are also the least likely to get breast-feeding. Breastfeeding and other safe baby feeding habits are therefore a possible source of action to help reduce the likelihood of obesity as well as other abnormal nutritional status in early childhood. The main objectives of this study were to investigate the situation when rearing and nurturing children and to explore the associated factors that affected to nutritional status of the children.

## METHODS

### Study design and Study site

This is a cross-sectional survey-based study conducted between September 2018 to April 2019. Data was collected from ten obstetrics and gynecology clinics located in Ho Chi Minh City. These clinics was randomly chosen from the list granted from the authorities.

**Sampling and Measurement**

The interviewers went to the clinic and invited mothers to participated in the study. Mothers were chosen if they have at least one child that at the age of 36 months or higher. Demographical and clinical characteristics of the mothers and the children was collected, including age, gender, height and weight of the children. Based on this information, we calculated their body mass index (BMI) and assessed by using BMI-for-age-and-gender quantile. Children had been categorized as underweight, normal, overweight and obese if their BMI were at <5<sup>th</sup>, 5<sup>th</sup> - 85<sup>th</sup>, 85<sup>th</sup> - 95<sup>th</sup>, and ≥95<sup>th</sup>, respectively on the percentile graph.

**Data analysis**

Data was then entered into Microsoft Excel for Window 2010 for management. Data analysis was performed by SPSS software version 23.0 (SPSS Inc., Chicago, IL, USA). Categorized variables were presented as frequency and percentage. Continuous variables were presented as mean, standard deviation (SD), median and quartile. Logistic regression was performed. Dependent variable was a discrete variable including normal and abnormal nutrition status. Underweight, overweight and obese was combined as abnormality. Independent variables were living area, education level, monthly income, monthly expenditure for childcare, living status and breastfeeding till 36 months.

**Ethical consideration**

The research complied with ethical standards by obtaining informed consent, ensuring respondent autonomy, and guaranteeing anonymity and confidentiality. Explanations provided to the respondents included information regarding the voluntary nature and safety of participation in the study. The participants were informed of their right to refuse participation or withdraw from the survey at any time without consequences. No details that could point to the participants' identities were reflected on the questionnaires, and only members of the research team were authorized to collect information on the participants.

**RESULTS**

Table 1 shows that the average age of the mothers was 29.4±4.6 years and the average age of the child was 24.1±5.7 months. The majority lived in urban area (60.1%), well-educated (83.5%). About half of the mothers earned at the middle interval income but about one-third (28.1%) spent at the high interval expenditure for their child. Most of the mothers had under three children.

**Table 1.** Characteristics of included mother (N=975)

Characteristics	n
Age of mothers (years)	
Mean±SD	29.4±4.6
Median (Q1-Q3)	27 (23-30)
Min-Max	18-36
Age of child (months)	
Mean±SD	24.1±5.7
Median (Q1-Q3)	25 (18-31)
Min-Max	1-36

Living area	
Rural	389 (39.9)
Urban	586 (60.1)
Education level	
Illiterate	9 (0.9)
Primary and secondary school	152 (15.6)
High school and higher	814 (83.5)
Monthly income	
Low	384 (39.4)
Middle	396 (49.8)
High	105 (10.8)
Monthly expenditure for childcare	
Low	305 (31.3)
Middle	396 (40.6)
High	274 (28.1)
Number of children	
1	402 (41.2)
2	452 (46.4)
≥3	121 (12.4)
Living status	
Single mom	174 (17.8)
Live with partner	801 (82.2)

*Note: Data was presented as n (%) unless state otherwise. Abbreviation: Q1, 25<sup>th</sup> quartile; Q3, 75<sup>th</sup> quartile; SD, standard deviation.*

**Table 2.** Feeding practices in neonates (N=975)

Variable	n	%
Kind of feeding		
Animal milk feeding	295	30.3
Exclusive breastfeeding	493	50.6
Mixed feeding	148	15.2
Formula feeding	42	4.3
Breastfeeding Interval After Birth (minutes)		
<30	165	16.9
30-60	586	60.1
60-120	184	18.9
≥120	31	3.2
Pre-lacteals		
Tea	11	1.1
Honey	619	63.5
Janamghutti	292	29.9
Others	49	5.0

**Table 3.** Logistic regression of the associated factors on newborn nutritional status (N=975)

Characteristic	OR	p-value
Living area		
Rural	3.76 (1.74-4.84)	0.009
Urban	1	
Education level		
Illiterate	2.91 (1.87-3.02)	0.025
Primary & Secondary school	1.72 (1.01-2.74)	0.013
High school and higher	1	
Monthly income		
Low	1.22 (1.07-2.21)	0.008
Middle	0.76 (0.02-1.79)	0.543
High	1	

Monthly expenditure for childcare		
Low	1.23 (0.97-1.73)	0.576
Middle	0.12 (0.01-0.72)	0.023
High	1	
Living status		
Single mom	0.72 (0.69-1.93)	0.345
Live with partner	1	
Breastfeeding till 36 months		
Yes	0.89 (0.76-0.92)	0.003
No	1	

Note: Data was presented as n (%) unless state otherwise.  
Abbreviation: Q1, 25<sup>th</sup> quartile; Q3, 75<sup>th</sup> quartile; SD, standard deviation.

In the Table 2, we can see the feeding practices of mothers to their child. Fortunately, over half of the mothers maintain breastfeeding (50.6%), others added animal milk or formula food for their child. Honey was the most preferred pre-lacteals (63.5%).

The result of logistic regression was shown in the Table 3. Thereby, child whose mothers lived in the rural area had 3.76 times higher risks to be under- or overweight, compared to those lived in rural regions ( $p=0.009$ ). Child whose mother were well-educated was had a lower risk of abnormal nutritional status. Compared to those who earned high income, mothers earned low income had higher risks to have abnormal-nutritional-status children. Obviously, children who were breast-fed till 36 months old had the lower risks to be under- or overweight than the counterparts.

## DISCUSSION

The main objectives of this study were to investigate the situation when rearing and nurturing children. This study found that over half of the mothers maintain their breastfeeding till 36 months old of the child. Rural area, lower educated, low monthly income was positively affected to the risks of children to be abnormal nutrition status. Oppositely, middle expenditure for child and breastfeeding was negative affected to the risk.

Generally, results from this study agreed with previous ones regarding socioeconomic factors that affect to the rate of under- or overweight children. Some studies found that children from poor families have the tendency to get obesity due to their overweight mothers.<sup>24-27</sup> Moreover, poverty and maternal obesity play negative role on breastfeeding practices.<sup>28, 29</sup> Thus, socioeconomically disadvantaged children are particularly at risk of obesity in early childhood.<sup>18</sup> In this study, rural, low-educated, and low-income mothers are more likely to have under- or overweight children, which consistent with previous findings.

Moreover, our findings add additional support to the literature to prove the important role of breastfeeding to children nutritional status. There are various pathways by which breast milk can affect weight gain for infants. Latest studies indicate that the biologically active ingredients in breast milk aid the development of babies and body mass.<sup>30</sup> Some research have shown that breastfeeding babies are

more likely to control the feeding themselves or be more sensitive to satiety rather than bottle-fed infants.<sup>31-34</sup> Previous studies has also suggested that breastfeeding mothers show feeding habits that are less aggressive and use lower control thresholds consistent with stable baby weight.<sup>35, 36</sup> Breast milk also includes compounds correlated with normal nutrition, and breastfeeding will promote baby self-regulation of eating and decrease maternal influence of feeding, both correlated with decreased early childhood overweight.

Other infant feeding patterns associated with an increased risk of obesity include the early introduction of solid foods. The introduction of solid foods before 4 months of age is associated with greater weight gain in infancy and early childhood.<sup>37, 38</sup> Analysis has also shown that repeated bottle feeding and having an infant in bed with a bottle is correlated with excess weight or overweight in infancy.<sup>39, 40</sup> The finding of this study was only applied for the restricted sample, which reduced the generalizability of the study..

## CONCLUSION

The risks of children to be under- or overweight was positively affected by rural area, lower educated, low monthly income and was negative affected by the middle expenditure for child and breastfeeding till 36 months old.

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## CONFLICT OF INTEREST

The authors have no conflicts of interests to declare.

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