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MALNUTRITION STATUS AND RELATED FACTORS WITHIN ETHNIC MINORITY CHILDREN UNDER 5 YEARS OLD IN NORTH TRA MY DISTRICT, QUANG NAM PROVINCE IN 2010

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SUMMARY

The number of malnourished children in Vietnam has reduced remarkably in recent years, but in mountainous and ethnic minority areas, the children malnutrition rate is still very high. We conducted this study in 9 poor communes where about 90% of the population belong to the ethnic minorities of North Tra My district, Quang Nam province with the following objectives: (1) to determine the malnutrition rate in ethnic minority children under 5 years old in North Tra My; (2) to describe factors related to the malnutrition rate in children under 5 years old at this location; (3) to propose solutions for feasible and sustainable interventions to improve the level of malnutrition in children under 5 years old. ***Methods****: Using a cross-sectional descriptive study, combining quantitative and qualitative methods in January, 2010, with a random sample including 1200 ethnic minority children under 5-year-old and their mothers; by weighing and measuring children's height, interviewing mothers.* ***Results****: The malnourished prevalence rate of underweight was 36.5%, in which 28.3% level I, 6.8% level II, and 1.4% level III; the stunting 62.9% and the wasting 8.6%; In-depth interviews show that many mothers don't let their children at eat protein-rich, available and fat- rich food because of they are afraid of it causing them abdominal pain and diarrhea.* ***Conclusion****: Some factors as child's age, weight at birth, exclusive breastfeeding within 6 months, time of the first additional feeding, child's acute respiratory infection, the child feeding practices that mother's lack knowledge about: using protein-rich and fat-rich food, using protein-rich, available food locally, mother's low educational level, poor economic conditions of families; dieting during pregnancy, going to work soon after birth, the limited capacity of health officials, a lack of interest of local leaders are the related factors to the child's malnourished status.*

Key words*: ethnic minority children malnutrition.*

1. Introduction

The national program for preventing and controlling child malnutrition has been deployed in Vietnam for many years and has achieved remarkable results. However the malnutrition rate amongst children is still very high in mountainous areas, within ethnic minorities and the rate is different among regions. Scientific evidence is needed for feasible solutions which are selected by the communities themselves. This is an effective and sustainable approach. North Tra My, a high mountainous district of Quang Nam province, has 9 poor communes in which about 90% of people belong to ethnic minorities. Priority health issues such as child malnutrition require attention. Therefore, we conducted this research to determine the malnutrition rate of ethnic minority children under 5 years old in North Tra My district; describe factors related to malnourished children under 5 years old at this location; and propose feasible and sustainable interventions to improve malnutrition in children under 5 in this location.

2. Methodology

2.1. Subject and setting:

- *Subject research:*

+ Ethnic minority children under 5 years old and their mothers

+ The commune leaders, village leaders, other officials of departments such as women, youth, the village elders.

- *Setting:* 9 poor communes of North Tra My district, Quang Nam province.

2.2. Research Method:

- *Study Design:* A cross-sectional descriptive design was used, combining quantitative and qualitative methods

- *Sample size and sampling.*

+ Sample size: The formula calculating sample size for a rate was used:

$$n = Z^2_{(1-\alpha/2)} \frac{p(1-p)}{d^2}$$

- With a 95% CI (confidence interval), Z (1 - α / 2) =1.96, estimated p = 0.35; accepted d = 0.04;
- Counts n = 546. Using two - stage sampling so a reasonable sample size is: 2n = 1092
- Estimated 5% drop out and rounding off, sample size required is 1200

+ Sampling:

✓ For children: a two - stage sampling strategy was used:

Stage 1: Randomization was used to select 6 out of 9 poor communes**:** *Trà Giáp, Trà Giác, Trà Đốc, Trà Tân, Trà sơn và Trà Kót.*

Stage 2: A random sampling method was used to choose children

✓ For mothers: All the mothers of selected children were included.

***- For qualitative research*:** intentionally selected in accordance with the component mass and standard sampling

- Methods and data collection tools:

+ Nutritional Status: Using anthropometric measurements, children were weighted and their height was measured using a specialized tool. The children's age was calculated according to the children's standard of the Vietnam Nutrition Institute. Nutritional Status Grading was calculated using a new WHO classification in 2006, the Vietnam Nutrition Institute has been deployed and applied in the community since June 2008. Children with weight/age (W/A), height/age (H/A) and weight/height (W/H) under -2SD (standard deviation) were considered to be malnourished by the classifications of underweight, stunting and wasting, respectively.

+ Relevant factors: Interviews based on the "survey list" were prepared. In-depth interviews and group discussions were organized at each commune

2.3. Handling and analyzing data: The software Epi Info 6.04a was used to analyze data. $\chi 2$ test (chi - squares test), P-values (probability-value) and OR (odds ratio) were used to analyze the relative factors

2.4. Research period: January, 2010.

3. Results

3.1. Rate of child malnutrition

Table 3.1. Prevalence of malnourished children according to form (n = 1200)

Malnutrition form	Normal	Malnutrition number	Malnutrition Percent (%)	95% CI
Underweight	762	438	36.5	33.8 – 39.2
Stunting	445	755	62.9	60.2 – 65.6
wasting	1097	103	8.6	7.1 – 10.2

Table 3.1. Shows the prevalence of wasting is the highest (62.9%)

Table 3.2. *The prevalence of underweight based on level*

Level	Level I	Level II	Level III	Total
Frequency	339	82	17	438
%	28.3	6.8	1.4	36.5

Table 3.2. Shows the prevalence rate of underweight is mainly at level I; but still 1.4% at level III.

3.2. Some factors related to the malnutrition status of children

Table 3.3. *Relationships between the survey factors with the malnutrition Status of children*

No.	**Factor**		***n***	***Malnutrition***	***%***	***P***
1.	Age (month)	0 - 12	246	62	25.2	p < 0.001
		13 - 24	257	89	34.6	
		25 - 36	239	102	42.7	
		37 - 48	226	98	43.4	
		49 - 60	232	87	37.5	
2.	Gender	Male	637	245	38.5	p > 0.05
		Female	563	193	34.3	
3.	Weight at birth (grams)	≥ 2500	986	345	35.0	p < 0.05 OR= 1.5 (1.1<OR<1.9)
		< 2500	214	93	43.5	
4.	Location (commune)	Trà Đốc	237	81	34.2	p > 0.05
		Trà Giáp	243	105	43.2	
		Trà Tân	120	37	30.8	
		Trà Kót	145	44	30.3	
		Trà Giác	258	107	41.8	
		Trà Sơn	197	64	32.5	
5.	Breastfeeding in the first hours after birth	Yes	1083	393	36.3	p > 0.05
		No	117	45	38.5	

6.	breastfeeding completely within the first six months	Yes No	370 830	113 325	30.5 39.2	p < 0.01 OR=1.3 (1.0<OR<1.6)
7.	The first time for children to eat food	Right Wrong	374 826	114 324	30.5 39.2	p < 0.01 OR = 1.5 (1.1<OR<1.9)
8.	Time to wean (months)	< 18 ≥ 18	203 997	75 363	36.9 36.4	p > 0.05
9.	Acute respiratory infection (last 2 weeks)	Yes No	748 452	341 97	45.6 21.5	p < 0.001 OR=3.1 (2.3<OR<4.0)
10.	Diarrhea (last 2 weeks)	Yes No	352 848	138 300	39.2 35.4	p > 0.05
11.	Using protein-rich food daily	Yes No	531 669	137 301	25.8 45.0	p < 0.001 OR= 2.4 (1.8<OR<3.0)
12.	Using protein-rich, available food daily	Yes No	237 963	62 376	26.2 39.0	p < 0.01 OR = 1.8 (1.3<OR<2.5)
13.	Eat fat - rich food daily	Yes No	389 811	93 345	23.9 42.5	p < 0.001 OR = 2.4 (1.8<OR<3.1)
14.	Ethnicity of mother	Cadong Cor Other	842 275 83	313 97 28	37.2 35.3 33.7	p > 0.05
15.	Education of mother	Illiteracy Primary ≥ Junior	256 354 590	112 135 191	43.8 38.1 32.4	p < 0.01

16.	Level of family economics	Enough to eat, comfortable, poor	446 754	120 318	26.9 42.2	p < 0.001 OR=2.5 (1.9<OR<3.2)

- Table 3.3 show that child's age (p<0.001), weight at birth (p<0.05, OR=1.5), breastfeeding completely feeding within 6 months (p<0.01, OR=1.3), time of first additional feeding (p<0.01, OR= 1.5), child's acute respiratory infection (p<0.001, OR=3.1), a lack of protein-rich and fat- rich food (p<0.001, OR=2.4), using protein-rich, available food at its local (p<0.01, OR=1.8), mother's low educational level (P<0.01), and poor economic conditions of families (p<0.001, OR=2.5) are factors related to the child's malnourished status.

- An association between the malnutrition status of children and other factors was not found: gender, place of residence, ethnicity of mother, breastfeeding in the first hour after birth, time of weaning, and children with diarrhea in past two weeks.

3.3. Results deep interviews and workshops in the communes

3.3.1. In-depth interviews of mothers show that

- Many mothers don’t let their children eat protein-rich, available and fat- rich food because they are afraid of their children suffering abdominal pain and diarrhea,

- Nutritional collaborators practice the nutritional model only once per year; using expensive food and not transferring the practices to participating mothers (mothers could not imitate),

- None of the communes have markets. Local people do not know how to preserve and store food.

- Self dug toilets and a lack of toilet is still common. Therefore hygiene is poor.

- All mothers believe in the advice of village elders and village leaders

- In each village there are also poor mothers, but their children are still healthy. They don’t put their children on a diet. They feed their children protein and fat rich foods that are available regularly, and are easy to access daily.

3.3.2. In-depth interviews of commune and village officials and locals show:

- Pregnant women don’t eat much, do not eat nutrients, and have to work hard because they believe that those activities will make their baby smaller, and consequently be easy to deliver.

- Pregnant women have the habit of drinking alcohol, and returning to work soon after birth. These practices are bad for both the mother and child.

- Festivals are often organized, but many fathers do not have the habit of saving food for shortage months, and do not try to find protein-rich foods for their child which are available locally.

- Local organizations showed a lack of interest. They did not focus on giving nutritional information to the population monthly and the study area had difficult economics. The poor health of children could be due to the fact that nutritious food is not readily available and environmental sanitation is limited.

3.3.3. Results of the workshops in the communes: At the workshops in the communes, the solutions are highly unified about the content and course of action as follows:

- Strengthening the role of the leadership of Party, the administration of local government, the coordination of agencies and organizations in each commune and each village.

- Establishing steering committees for preventing and controlling child malnutrition in each commune, as well as a village self-management team at each village with each member being assigned specific tasks.

- Unifying the activity plan of preventing and controlling child malnutrition in 2010, including:

+ Group *Discussion about typically poor mothers feeding healthy children*" protein-rich and available food at their local";

+ Organizing *monthly nutritional practices* in each village;

+ Training in *communication skills* for the network of nutritional collaborators;

+ Training of *supervisor and evaluation skills* for commune officials, village elders and village leaders;

+ Integrating media to educate feeding behavior every month in order to change mothers' behavior;

+ worming every 6 months for children up to two-years-old;

+ Supplying iron, folic acid, and zinc for children up to six-months-old;

+ *Organizing competitions* for mothers feeding healthy children;

+ *Organizing competitions* for good nutritional collaborators;

+ *Mobilizing all people to participate in the movement: "the cultural village, food security, food safety for the development of children*" by the village leaders and village elders, under the direction and administration of the commune People's committees.

Criteria

Cultural village: the birth of no more than two children; clean and hygienic villages; the use of sanitary latrines; not abstain from food, and not drinking alcohol whilst pregnant;

Food security: encourage parents to save food for the months between crop periods; encourage parents to feed their children daily with foods containing protein, fat, fruits and vegetables from locally available food.

Food safety: Help each other to learn how to preserve animal fat and protein for use over many days; maintain hygiene whilst eating by wash hands with soap before eating and after using the toilet.

Holding final workshops about activities to prevent and control malnutrition children and self-management model.

4. Discussion

4.1. Prevalence rate of malnutrition

- *Based on the weight for age index:* Weight is the picture of the child's nutritional status at the time of measurement. Research results show that the underweight prevalence rate of ethnic minority children under five-years-old in poor communes of North Tra My district is 36.5% (95% CI: 33.8% - 39.2%). According to the WHO classification this is very high. The underweight rate of malnourished children in this study is equivalent ($p>0.05$) with the percentage of underweight malnourished children under age 5 in Tra Linh highland commune, south Tra My district in 2008 (39.4%). This percentage (36.5%) is higher ($p<0.05$) than the rate of underweight children under 5 years old in Hai Chanh commune, Hai Lang district (Quang Tri province) in 2003 (29.2%), as well as in Cam Thuy district, Thanh Hoa province in 2007 (30.8%) and much higher than the national rate in 2008 (19.9%) ($p < 0.001$). The National prevention and control program for malnourished children is effective in many regions in the country, but of which impact is limited to these communes. This percentage (36.5%) is a measure of the true socio-economic level of research locals.

- *Based on the height for age index:* Height is a measure of the historical development of child. A child with low height (compared with age) demonstrates children who were previously frequently malnourished children and often occurs in populations which lack food for long periods, which causes chronic malnutrition. According to the WHO, the rate of 62.9% (95% CI: 60.2% - 65.6%) of stunting in children under five years old is very high. It is higher than in other areas such as in South Tra My (49.6%); in Cam Thuy, Thanh Hoa (24.6%); 29.9% of Soc Son in Ha Noi; 29.6% of the nation in 2005. It shows that stunting malnutrition is still a common situation in our country's children now.

- *Based on the weight for height index:* This indicator shows children with acute malnutrition but if a baby lacks of both weight and height for age, the index can be still normal. The wasting rate in these communes is 8.6% (95% CI: 7.1% - 10.2%). This is similar to the national rate (8.6%) and lower than nearby Tra Linh (12.3%); because the stunting rate in these communes (62.9%) is much higher than the rate of underweight itself (36.5%), the wasting rate here is low as shown.

4.2. Factors related to malnourished children

- Age and malnutrition: Table 3. Shows that a change in the rate of malnutrition in children increases quickly from 1 year old (25.2%) to 2 years old (34.6%), and reaches the top at age 4 (43.4%). This is a consequence of rearing children. Around 2 years old is the most difficult period in the life of a child because they gradually stop breastfeeding and begin to eat the solid food. They are threatened by external environmental factors, especially microorganisms that cause respiratory and digestion diseases, etc..., that are reason for children of the 4-year-old group having the highest rate of malnutrition. At the age of 5, the malnutrition rate is lower (37.5%), maybe this is the result of the national program to prevent and control children malnutrition and other socio-economic programs (such as Program 134 and 135).

- The other elements that remain in relation to the malnutrition status of children are identified in this study (Table 3) essentially as the malnutrition risk factors for children; these factors have been raised by WHO. Particularly, small children are vulnerable because their development is rapid, requiring a lot of energy, and having nearly no energy reserves, they must undergo a period of gradual adaptation to the food of adults and they are also influenced by frequent infections, parasites, viruses, etc.... Those risks occur mainly in developing world countries, especially because of poverty, high birth rates per family, environmental pollution, etc...; leading to the existence of a high rate of infectious diseases and malnutrition. This situation repeats through generations, creating a cycle which is difficult to solve. This is clearer in research setting.

4.3. The interventional solution

Many intervention solutions are based on related factors and are found in areas that that community may have deployed effectively for many years such as " the interventional model basing on community participating together" of Dam Khai Hoan; "interventional model basing on specific contexts and gender-sensitive" by the authors Vo Van Thang, Dao Van Dung and “diversifying the forms of communications, and health education” of Nguyen Thi Kim Lien...

In the North Tra My mountainous district, when we organized workshops, reported research results, learned about the related factors of malnutrition of ethnic minority children, the majority of delegates attending the meeting are supportive of the

“interventional model basing on village elders, village leaders" under the direction of commune leaders; the coordination of the health departments, organizations and local residents to make a better plan as agreed.

Thanks to innovation in recent years, our country has become one of the leading rice exporters in the world. Vietnam is no longer a poor country, but we need to have time to raise the education level of the people. Health education in general, and guiding mothers on how to bring up and take care of children in particular need to be further strengthened, especially for ethnic minorities who have been living in mountainous, border and island areas.

5. Conclusion

5.1. Prevalence of malnutrition

The malnutrition prevalence rate of underweight was 36.5%, in which 28.3% was level I, level II was 6.8% and 1.4% was level III; stunting was 62.9% and wasting was 8.6%.

5.2. Some relevant factors

The child's age, weight at birth, exclusive breastfeeding within 6 months, time of the first additional feed, child's acute respiratory infection, mother’s practices regarding feeding their child protein-rich and fat-rich food every day, using protein-rich, available food that is locally available, mother’s low educational level, poor economic conditions of families; dieting during pregnancy, returning to work soon after birth, the limited capacity of health officials, and a lack in interest of local leaders are all factors related to the child's malnutrition status.

6. Recommendation

These problems can be addressed through building an "interventional model of preventing and controlling malnourished children based on village elders and village leaders" under the directions of commune leaders; and the coordination of the health departments, organizations and local residents.

REFERENCES

1. Nguyen Van Cam and associates. *Research status of malnourished children under 5 years old and some related factors in Tra Linh, Nam Tra My district in 2008*. First Proceedings of scientific meeting, in 2008; Nam Tra My Hospital, 48-52.
2. Khai Hoan Dam. *Research to build a model community to join in the activities of health care for people in northern mountainous regions*. PhD thesis medicine, Hanoi. 1998; 126 – 127.

3. Nguyen Thi Kim Lien. *Assessment of the status and efficient solutions of a communicational intervention, health education in children's health care system at medical facilities*. PhD thesis medicine. 2006; 87.

4. Public health Department - Hanoi Medical College , "*Choosing sample, sampling size in epidemiological study", " Technique and tool collecting information*", Methods of scientific research in medicine and public health, Medicine Publisher. 2004; 58-95.

5. Ministry of Health, National Institute of Nutrition. *Guide to assess nutritional status and food in a community*, Hanoi Medical Publishing Houses. 1998; 13-16, 59-72,

6. Dinh Thanh Hue. *Status of malnourished children under 5 years old Hai Chanh commune, Hai Lang, Quang Tri in 2003*. Journal of preventive medicine, group XIV, No. 4. 2004; (68), 70-74.

7. Ministry of Health, National Institute of Nutrition . "*Summary Report of the health works in 2008 and plan in 2009"*, Journal of Practical Medicine No. 1 / 2009 (641-642), 40-10.

8. UNICEF. The state of the world's children 1998, Published for UNICEF by Oxford University press. 1998; 11, 24.

9. Vo Van Thang, Dao Van Dung. "*Interventional Model basing on Advancing reproductive health care service and family planning using in 7 poor communes, Nam Dong district, Thua Thien Hue"*, Journal of Practical Medicine No. 8 (517). 2005; 70-73.

10. WHO. *Child Growth standards Methods and Development*. XVII. 2006; 226.