Food Security as Determinant of Anemia at Household Level in Nepal

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Abstract This study investigates to assess the validity of household food security through its association between anemia and food insecurity by using a data set of Demographic Household Survey (DHS) 2011 in Nepal. About 32.3% households were not anemic, 19.9 % moderate, 12.1 % mild while 2.8 % households resulted as severe anemic based on the organized indexed appraisal of food security. Moreover, based on the Chi-square (5.06) value it is demonstrated that food security and anemia has no strong association. The result of the multinomial logit model reveals that woman education, media awareness, households from middle and rich class has significant while food poverty has insignificant impact of anemia. It is concluded that food security may not be a sufficient on its own to impact anemia.

Keywords: anemia, poverty, food security

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1. Introduction

Throughout out the man history food insecurity afflicted him acrimoniously. It is confirmed to be a crucial element of the general welfare (Kennedy, 2002) [9] and a fundamental part of development (Busch, 1997) [6]. Food security has a relation with the supply of food at a certain time and at a certain place. Household food insecurity has a depressing impact on food consumption and eventually it has an adverse impact on the health (Miller *et al.,* 2009) [11], Anemia is one of it.

Anemia is a global health problem (Bentley and Griffiths, 2003) [3] is also defined as hemoglobin (HB) < 11.5 gm/dl and severe anemia is defined as hemoglobin (HB) < 8.0 gm/dl (WHO, 2001) [18]. Due to reduction in the required hemoglobin level it causes to affect the mental as well as physical health of a person. Anemia causes to decrease the efficiency of a person and it is considered more in the women but in fact it is more harm in men as in women. Women with even mild anemia may experience exhaustion and have condensed work capability (Gillespie, 1998) [7]. Lower standard of living had high a probability to being anemic while socio- economic and demographic factors had a high association with mild or moderate anemia (Bentley & Griffiths, 2003) [3]. Arena and Anyaeji

(2010) [1] used binary logit model to show that people with high income and also in higher age groups were found to be more food secured than the others. Knowledge of rural women was found to be very poor in regard of nutritional anemia. Moreover, as educational level increases among the rural hill woman probability of anemia can also be decreased at household level (Upadhyay *et al.,* 2011) [17]. Skalicky *et al.,* (2006) [15] accomplished by the use of hospital based hematological cross sectional data that there was no relationship between child food insecurity and anemia in both cases of iron deficiency and without iron deficiency. Severity of anemia was higher among the boys belonged to lower social class as compared to boys with higher socioeconomic status. Anemia was more prevalent among boys who had meals twice a day than the boys had meals thrice a day (Jain *et al.,* 2011) [8].

Nepal is a developing country, facing numerous challenges of undernourishment and food insecurity as well (Ward and Shively, 2011) [19]. The Global Hunger Index (IFPRI 2009) is also ranked Nepal extremely stumpy among twenty foods deprived countries. This study is focused to assess the association between anemia and food security, with the determination of the factors affecting anemia at household level in Nepal.

2. Materials and Methods

Table 2.1. Percentage of households that experienced specific food security and insecurity conditions in the last 12 months

Responses of households	Not able to eat preferred food	Ate a limited variety	Ate a smaller variety	Ate fewer meals	No food to eat	Sleep hungry
Never	22.7	23.2	31.9	34.1	35.3	37.2
Rarely	4.0	4.3	3.8	3.2	2.9	2.0
Sometimes	8.4	8.2	4.0	2.8	2.1	1.2
Often	5.6	4.9	0.9	0.6	0.4	0.2

Demographic Household Survey data of country Nepal for the year 2011-12 is used to find the relation between food security and health diseases anemia. The availability of food is determined by the specific range of households by adding the response for different conditions that have been experienced by the households.

The sum up of all these categories gives a response range from 0 to 21. On the basis of this raw score, food security is categorized as.

1. Households with 0 score is considered as the food secure.
2. Households with a score of 1-7 are labeled as moderated or averaged food secure.
3. Households with scores of 8-14 are categorized as mild food insecure.
4. Households with 15-21 are severe food insecure.

Table 2.2. Percentage of households with anemia by different levels of food security

Anemia classification	Food secure Households	Moderately food insecure households	Mild food insecure households	Food insecure Households
Severe	1.7	1.1	0.5	0.2
Moderate	2.6	1.5	0.9	0.2
Mild	11.6	7.3	4.4	1.0
Not Anemic	32.3	19.9	12.1	2.8
Chi-square (p-value)	5.08 (0.82)			

Chi-square analysis compared different levels of food security relating to the possibility of households are being anemic or not. Food security only is not a matter to have prerequisite level but different types of dietary intakes are also necessary to be healthier. The same results are verified by the (Miller *et al.* 2009 & Says *et al.*, 2011) [11,14] that the logical anticipation of a significant association between iron deficiency anemia and food insecurity was undocumented.

3 Results and Discussion

Table 3.1. Determinants of Anemia at household level in Nepal

Independent Variables	Severe anemic	Odd Ratio's	Moderate anemic	Odd Ratio's	Mild anemic	Odd Ratio's
Intercept	-.3911	-	-.5.409	-	.217	-
Wealth index						
Poor	-1.283*	.277	.143	1.154	-.064	.938
Middle	-.994*	.370	.022	1.022	-.122	.885
Rich	0b	-	-	-	-	-
Woman education						
No education	.825	2.28	2.417*	11.21	-.538*	.584
Primary	1.412**	4.10	0.574	1.77	-1.718*	.179
Secondary	1.787**	5.97	1.783*	5.94	-.1.034*	.356
Higher	0b	-	-	-	-	-
Woman decision						
No decision	.111	1.11	.632**	1.88	-.140	.869
Shared decision	0b	-	-	-	-	-
Media awareness						
No	-.701*	.403	-.709*	.492	-.190*	.827
Yes	0b	-	-	-	-	-
Sex of household head						
Male	-.221**	.521	.158**	1.17	-.020**	.980
Female	0b	-	-	-	-	-
Place of residence						
Urban	-.625*	1.24	.233**	1.26	-.096	.908
Rural	0b	-	-	-	-	-
Food poverty						
Non_ poor	-.578	.561	.5.187	1.20	-.079	.924
Mild	-.527	.591	.164	1.17	-.024	.977
Moderately	-.415	.660	.122	1.13	-.030	.971
Chronic	0b	-	-	-	-	-

*signifient level at 1% and** 5%. Not anemic is taken as the reference category

It is shown that wealth index, woman education, sex of household head, and residence of households are statistically significant factors of anemia at different levels. Households from the middle class have the highest odds of facing severe anemia on the other hand poor households are observed to be significantly more likely to be severe and moderate anemic when compared to the rich households. There will be less chances of iron deficiency anemia when the households are in better living condition (Zang et al., 2008) [20].

While comparing the male head of female head households severe anemic to non anemic there are 52 times less chances to be severely anemic. The same is the case when comparing not anemic to the moderate anemic this chance is reduced by 1.17 times while in case of mild anemic there is 0.98 times less chances. It means as compared to female households if the head of the house is male there will be fewer chances for the members to be anemic. As compared to the rural households in urban households have significantly lower odds of being

severely anemic. This supports the fact that poor health is the most probably found in the rural households (Rossi-Espagnet, 1984) [13].

From the woman's point of view, most of houses in the world they decided what to cook and how to, they better understand the position and condition of all household members (Khasnobis & Hazarika, 2006) [10] so their educational level is one of the important factors in both severe and moderate cases of anemia.

While in the case of the mild anemia the risk is also high in the woman having a higher educational level. Brabin et al., (1999) [5] also defined that a woman can better decide and change their life if they are willing and ready to change. If the women are the decision maker about the earnings they causes to be significantly controlled the anemia by allocating most of the family sources to food (Bruce et al. 1995) [4] than the other household decision maker. There are 11 chances to be severely anemic when it is compared to not anemic that woman decides about the purchasing. While 88 chances are there in case of moderate anemia and 0.86 chances there that households are mildly anemic when it is compared to not anemic households. Food poverty has no statistically significant impact on the different levels of anemia. It may be due to the inadequate dietary intake of iron, low level of absorption and increased physiological condition. Batool *et al.,* (2010) & Osei *et al.,* (2010) [2,16] also explored by the use of cross sectional data that food and anemia also does not have a direct significant association.

Index of media awareness has a significant impact on the way households use their diet here watching television, reading newspaper, and listening radio is considered as this proxy, households whose have no media awareness have 1.56 percent more chances to be severe, 1.21 percent to be moderate and 0.98 percent to be mildly anemic than the others who have some extent of awareness.

4. Conclusion

In the conclusion, the real picture about food insecurity in Nepal is gloomy by itself. Anemia is a one of the dark side of food insecurity. Different households effect by it in different ways. Its effect may be for a long term but policies should be there to ensure food security for all households.

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