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Research Article

KNOWLEDGE OF MICRONUTRIENT AMONG PREGNANT WOMEN IN PUNARWAS MUNICIPALITY, KANCHANPUR DISTRICT, NEPAL

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ABSTRACT

Background: Micronutrient deficiencies are a major global health problem. The majorities of affected populations are from developing countries.

Objective: To assess knowledge of micronutrients and associated socio-demographic factors among pregnant women in Punarwas Municipality, Kanchanpur district, Nepal.

Methods: A Cross sectional descriptive survey using a structured questionnaire was implemented to assess the knowledge of micronutrients among 380 pregnant women in Punarwas Municipality, Kanchanpur, Nepal. Multi stage sampling was used to collect data. SPSS Version 21 was used to analyze the data.

Results: Majority 71.3 % of the respondents were between 20 to 30 years, followed by 8.9 percent 30 to 40 years, Out of 380 respondents, 45.3% knew about the vitamin A rich foods, 42.6% iron, 41.3% folic acid, 43.9% zinc, 82.4% iodine and 25.3% calcium respectively. More than half of study population had poor knowledge (54.7%) about micronutrients. Age, type of family, education, monthly income and occupation were found significantly associated with level of knowledge.

Conclusion: More than half of the pregnant women had poor level of knowledge and awareness about micronutrients. Pregnant women should be given nutrition education to improve the knowledge of nutrition.

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INTRODUCTION

Micronutrients are the nutrients needed by the body in very small quantities usually less than 1 gram per day which consists of vitamins and minerals. Micronutrients are essential for healthy brains, bones and bodies including normal metabolism, growth and physical well-being. Micronutrient rich foods are those foods that contain high proportion of micronutrients in it in comparison to other foods. Consumption of variety of micronutrient rich foods is necessary for good health especially for people with special needs like pregnant and lactating women, infants and young children, and the elderly people. Micronutrient deficiencies are major global health problem worldwide. The majorities of the people affected are from developing countries and are typically with one or more than one micronutrient deficiency¹. Micronutrient deficiencies in pregnant women give rise to the risk of death during childbirth, or low birth weight delivery or intellectually-impaired baby. Pregnant women are particularly susceptible to nutritional deficiencies due to the increased metabolic demands imposed

during pregnancy. Micronutrient deficiencies exist in poor settings particularly due to the low consumption of micronutrients rich foods uniformly². Micronutrient deficiencies are associated with increased incidence of infections and mortality from diarrhea, pneumonia and measles¹.

Healthy nutritional status of reproductive aged women is crucial for lowering susceptibility for reproductive complications and illness. Pregnancy is one of the most important periods in life when increased micronutrients along with macronutrients are most needed by the body for the health and well-being of the mother and for growing fetus and newborn child³. Iodine deficiency is the most prevalent cause of brain damage and can result in adverse effects on growth and human development including cognitive impairment. Approximately 1.88 billion people worldwide have an inadequate iodine intake⁴. Inadequate dietary intake is the underlying cause for maternal under nutrition. The lack of awareness about dietary requirements, especially during

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adolescence and pregnancy, poor dietary diversity and inequitable household food distribution results in inadequate dietary intake⁵. The Government of Nepal has prioritized good nutrition as a fundamental right of its citizens. The Government of Nepal has been focusing on Vitamin A, Iron and Iodine along with others, still overall prevalence of micronutrient deficiencies ranges from 6.2% to 59% in pregnant women⁶. Micro nutrient deficiencies and its consequences in pregnancy are often preventable through proper knowledge and awareness about micro nutrients and its importance.

The study was conducted to assess the knowledge of micronutrients and associated socio-demographic factors among pregnant women in Punarwas Municipality, Kanchanpur district, Nepal.

METHODOLOGY

A descriptive institution based cross sectional study was carried out among pregnant women in Punarwas Municipality, Kanchanpur district, Nepal in between February to August, 2017 using interview method. Samples size was collected using formula, $n = \frac{NZ^2p(1-p)}{[d^2(N-1) + Z^2p(1-p)]}$, where, n= required sample size, N = Population= 6,890, p = Estimated proportion=0.5, d= precision=5%=0.05, Z = standard normal deviation at 95% level of confidence =1.96. Adding 5% non-response rate, the final sample size was 380. Only pregnant women who were receiving services from FCHVs of the study site and willing to participate in the study were included and those who were identified medically as mentally retarded were excluded. Pre testing was done among 5% of the sample size in Punarwas Municipality, Kanchanpur district, Nepal. Pretested samples were excluded from the final study. Data was entered and analyzed using SPSS version 21. Knowledge level was calculated to find out the association between knowledge and socio demographic factors. Awareness level was calculated using awareness in 5 micronutrients- Vitamin A, Iron and folic acid, Iodine, Zinc and Calcium. Likewise knowledge level was determined using 32 questions related with micronutrients.

Approval for conducting study was taken from Akal College of Health and Allied Sciences, Eternal University, India. Informed consent was also taken from pregnant women and health posts authorities.

RESULTS

General Background

Majority of the respondents (71.3 %) were of 20-30 years of age, followed by 8.9% of 30 to 40 years, and only 3.9% of the respondents were below 20 years of age. Less than half, 42.9% of the respondents were from the nuclear family, 33.9 percent from joint family and 23.2 percent from extended family. Among the pregnant women, 40.3% were literate, 25.3% illiterate and rest had formal level of education. Regarding family monthly income, 48.4% were having less than NRs.5000. Regarding occupation, 34.5% pregnant women were housewife, 31.6% labor, and 21.1% business women, 8.9% had services and 3.9% were students. Nearly half (47.4%) were with gravida 2, 45.8% with gravida 1 and 6.8% with gravida three or more. Majority (60.8%) of respondents had zero abortion, 23.2% one abortion, 16% had two or more abortions. Nearly half, (47.4%) had pregnancy gap of less than two years

and 52.6% had pregnancy gap of 2 years or more. More than half of the decision makers (54.5%) for health seeking behavior were husband, 44.2% were father, 45% were self while rest (14.7%) were others.

Knowledge about Micronutrients

The table 1 illustrates the knowledge regarding Vitamin A and Iron/Folic acid among pregnant women. Only 45.3% of the respondents had knowledge about Vitamin A rich foods of which most of them knew from family members (91.3%) and medical personnel/FCHVs (91.3). Concerning Vitamin A deficiency, 52.3% knew about night blindness, 2.3% Xerophthalmia, 18.6% Keratomalacia, 22.1% bitots spots and, 4.7 % had no knowledge about the consequences. The known sources of Vitamin A were fruits (86.6%), eggs, meat/fish (71.5%), milk (70.3%) from milk, vegetables (69.2%). Only 42.6 % of the respondents had knowledge about the iron rich foods of which information source were family member (70.4%), medical personnel/FCHV (66%), school (57.4%), radio (56.8%), and television (52.5%). The known sources of Iron were green leafy vegetables (97.5%), eggs (75.9%), meat (67.9%), fish (66.7%) and soyabean (43.2%). Majority of the respondents, 64.2% had knowledge about anemia. The major known causes of anemia were excessive blood loss(66.4%), lack of iron intake (66.4%). Regarding folic acid, 41.3% had knowledge about it.

Table 1 Knowledge Regarding Vitamin A and Iron/Folic Acid

Characteristics	Frequency	Percentage
Heard about Vitamin A rich food	(n=380)	
Yes	172	45.3
No	208	54.7
Sources of Information About Vitamin A	(n=172)	(Multiple Response)
Family Member	157	91.3
Medical Practitioner/FCHV	157	91.3
Television	64	37.2
Radio	72	41.9
School	73	42.4
Do not know	8	4.7
Importance of Vitamin A rich foods	(n=172)	(Multiple Response)
Yes	150	87.2
No	22	12.8
Deficiency of Vitamin A	(n=172)	(Multiple Response)
Night blindness	90	52.3
Xerophthalmia	4	2.3
Keratomalacia	32	18.6
Bitots Spot	38	22.1
Do not Know	8	4.7
Sources of Vitamin A	(n=172)	(Multiple Response)
Fruits	149	86.6
Vegetables	119	69.2
Meat/Fish	123	71.5
Egg	123	71.5
Milk	121	70.3
Do not know	11	6.4
Heard about Iron rich foods	(n=380)	
Yes	162	42.6
No	218	57.4
Sources of Information About Iron rich food	(n=162)	(Multiple Response)
Family Member	114	70.4
Medical Personnel/FCHV	107	66.0
Television	85	52.5
Radio	92	56.8
School	93	57.4
Do not Know	23	14.2
Importance of Iron rich food	(n=162)	(Multiple Response)

Yes	134	82.7
No	28	17.3
Heard about anemia (n=380)		
Yes	244	64.2
No	136	35.8
Causes of anemia (n=244) (Multiple Response)		
Excessive loss of blood	162	66.4
Lack of Iron intake	162	66.4
Insufficient nutrition	60	24.6
Do not know	31	12.7
Deficiency of Iron (n=162) (Multiple Response)		
Iron deficiency anemia	150	92.6
Colon cancer	150	92.6
Pale skin	130	80.2
Hair loss	130	80.2
Heard about Folic Acid (n=380)		
Yes	157	41.3
No	223	58.6
Intake of Folic Acid during 1st trimester (n=380)		
Yes	110	28.9
No	62	16.3
Do not know	208	54.3
Sources of Iron (n=162) (Multiple Response)		
Meat	110	67.9
Fish	108	66.7
Eggs	123	75.9
Soya beans	70	43.2
Green leafy vegetables	158	97.5
Do not know	113	69.7

Table 2 reveals the knowledge regarding Zinc. Only 43.9 % of the respondents had knowledge about Zinc of which 89.2% knew from medical personnel/ FCHV, 82.6% family members, 8.4% television, 4.8% school, 3% from radio. Nearly half (47.9%) had knowledge about importance of Zinc. Regarding consequence of Zinc deficiency, 41.9% knew that it caused loss of appetite, 26.3% diarrhoea, 13.7 % growth retardation, 8.9% hair loss. The known sources of Zinc were fortified cereals (70.1%), grains (60.5%), beans (54.5%), dairy products (41.3%) and red meat (40.7%).

Table 2 Knowledge Regarding Zinc

Characteristics	Frequency (n=380)	Percentage
Heard about Zinc		
Yes	167	43.9
No	213	56.05
Sources of Information about Zinc (n=167) (Multiple Response)		
Family member	138	82.6
Medical personnel/FCHV	149	89.2
Television	14	8.4
Radio	5	3.0
School	8	4.8
Do not know	11	6.6
Importance of Zinc (n=167) (Multiple Response)		
Yes	80	47.9
No	87	52.1
Deficiency of Zinc (n=167) (Multiple Response)		
Diarrhoea	44	26.3
Loss of appetite	70	41.9
Growth retardation	23	13.7
Hair loss	15	8.9
Do not know	14	8.4
Source of Zinc (n=167) (Multiple Response)		
Red meat	68	40.7
Fortified cereals	117	70.1
Beans	91	54.5
Grains	101	60.5
Dairy products	69	41.3
Do not know	23	13.8

Majority of respondents (82.4%) had knowledge about iodine of which 76.4 % of respondents knew from medical personnel/FCHV, 64.2% school, 28.8% radio, 28.1% television, 13.7% from family member. Regarding consequences of Iodine deficiency, 85.6 % knew it could cause goitre, 12.1% hypothyroidism, 28.1% mental retardation and 21.4% dry skin. Majority of the women (82.4%) responded using iodized salt in their food. The known sources of iodine were milk (96.2%), eggs (93.9%), beans (77.3%), yogurt (71.2%) and vegetables (68.7%). Only one fourth (25.3%) had knowledge about the Calcium of which 94.8% knew from medical personnel/ FCHV, 90.6% family members, 43.8% school, 16.7% radio, 10.4% television. Majority of the respondents knew the effect of Calcium, 95.8 % knew that it caused muscles cramps, 49.0 % easy fracturing of bone, 96.9 % numbness and 2.1 % did not know. The known sources of calcium were green vegetables (78.1%), milk (69.8%), orange (29.2%) orange and sardines (13.5%).

Table 3 Knowledge Regarding Iodine and Calcium

Characteristics	Frequency	Percentage
Heard about Iodine (n=380)		
Yes	313	82.4
No	67	17.6
Source of Information about Iodine (n=313) (Multiple Response)		
Family member	43	13.7
Medical personnel/FCHV	239	76.4
Television	88	28.1
Radio	90	28.8
School	201	64.2
Do not know	18	5.8
Heard about the importance of Iodine rich food (n=313) (Multiple Response)		
Yes	298	95.2
No	15	4.7
Deficiency of Iodine (n=313) (Multiple Response)		
Goitre	268	85.6
Hypothyroidism	38	12.1
Mental retardation	88	28.1
Dry skin	67	21.4
Do not know	39	12.5
Use of Iodized Salt (n=380)		
Yes	313	82.4
No	67	17.6
Reason for using Iodized Salt (n=313) (Multiple Response)		
Help to prevent goiter	274	87.5
Good taste	67	21.4
Available in market	252	80.5
Other	5	1.6
Source of Iodine (n=313) (Multiple Response)		
Milk	301	96.2
Yogurt	225	71.2
Egg	294	93.9
Vegetable	215	68.7
Beans	242	77.3
Do not know	11	3.5
Heard about Calcium (n=380)		
Yes	96	25.3
No	284	74.7
Source of Information about Calcium (n=96) (Multiple Response)		
Family member	87	90.6
Medical personnel/FCHV	91	94.8
Television	10	10.4
Radio	16	16.7
School	42	43.8
Other	1	1.0
Heard about Importance of Calcium rich food (n=96) (Multiple Response)		
Yes	57	59.4
No	39	40.6

Deficiency of Calcium	(n=96)	(Multiple Response)
Muscle cramp	92	95.8
Easy fracturing of bone	47	49.0
Numbness	93	96.9
Late sign of puberty	7	7.3
Do not know	2	2.1
Source of Calcium	(n=96)	(Multiple Response)
Milk	67	69.8
Orange	28	29.2
Sardine	9	9.4
Green vegetables	75	78.1
Do not know	13	13.5

Table 5 shows the awareness and knowledge level of respondents. More than half of study population had poor awareness level (54.7%) about micronutrients followed by good (42.6%) and average (2.6%). More than half of study population had poor knowledge level (54.7%) about micronutrients followed by good (31.3%) and average (13.9%).

Table 4 Status of knowledge and awareness among respondents about nutrients

Characteristics	Score	Frequency (n=380)
Awareness level		
Poor	0-1	208(54.7)
Average	2-3	10(2.6)
Good	4-5	162(42.6)
Knowledge level		
Poor	0 – 10	208(54.7)
Average	11 – 21	53(13.9)
Good	22 – 32	119(31.3)

#Figures in parentheses indicate percentage

Association between Socio-demographic factors and knowledge level

Table 5 reveals the association between different socio-demographic factors. Age, type of family, educational status, monthly family income, occupation were found associated with level of knowledge on pregnant women at p-value<0.001.

Table 5 Knowledge of pregnant women according to their demographic profile

Profile	Level of Knowledge			χ ²	p-value
	Poor	Average	Good		
Age(years)					
≤ 20	0(0.0)	0(0.0)	15(100.0)	51.604	<0.001*
21 – 30	157(57.9)	28(10.3)	86(31.7)		
31 – 40	41(56.9)	21(29.2)	10(13.9)		
>40	7(31.8)	8(36.3)	7(31.8)		
Type of family					
Nuclear	68(41.7)	52(31.9)	43(26.4)	263.1	<0.001*
Joint	127(98.4)	1(0.8)	1(0.8)		
Extended	13(14.8)	0(0.0)	75(85.2)		
Education					
Illiterate	96(100.0)	0(0.0)	0(0.0)	314.49	<0.001*
Literate	73(47.7)	52(34.0)	28(18.3)		
Primary	10(15.4)	1(1.5)	54(83.1)		
Secondary	0(0.0)	0(0.0)	36(100.0)		
Above SLC	29(96.7)	0(0.0)	1(3.3)		
Monthly income (NRs.)					
≤5000	88(47.8)	22(12.0)	74(40.2)	220.4	<0.001*
5001 – 10000	44(58.7)	30(40.0)	1(1.3)		
10001 – 20000	0(0.0)	1(2.2)	44(97.8)		
> 20000	76(100.0)	0(0.0)	0(0.0)		
Occupation					
Service	17(50.0)	0(0.0)	17(50.0)	124.8	<0.001*
Business	40(50.0)	1(1.2)	39(48.8)		
Labor	41(34.2)	17(14.2)	62(51.7)		
Housewife	95(72.5)	35(26.7)	1(0.8)		
Student	15(100.0)	0(0.0)	0(0.0)		

#Figures in parentheses indicate percentage*Statistically significant at p<0.05

DISCUSSION

In view of the fact that micro deficiency in pregnant women is associated with increased risk infection and death or deficient baby, and the present study was conducted in 380 pregnant women Punarwas Municipality, Kanchanpur, Nepal. The literacy rate of pregnant women is almost found to that of Nepal⁷. A similar study conducted by GamedaDaba *et al* in Ethiopia⁸ in 2013 found 21% had knowledge on food source of Vitamin A, 29.4% Iron and 19.4% Iodine which is much lower than that of present study. This shows that there were more differences in knowledge on Nepalese and Ethiopian pregnant women.

A study conducted by Ghimire *et al* in 2013 in Nepal⁹ found that known sources of iron were green leafy vegetables (67.5%) followed by meat, fish, egg (49.2%) which is quite similar to the findings of present study. The awareness of folic acid among pregnant women in the present study is similar to the study conducted by Venkatramana *et al* in India¹⁰ in 2017 where only 40% of women were found aware of folic acid.

In the present study, 43.9% of the respondents had knowledge about Zinc whereas more than half (56.1%) had no knowledge. 89.2 % respondents knew about the sources of zinc from Medical personnel/ FCHV, 82.6 % family members, 8.4 % Television, 4.8 % School, 3 percent from Radio and 6.6% did not know about it. 70.1 % of respondents knew about sources of Zinc from Fortified cereals, 60.5 % Grains, 54.5 % Beans, 41.3 % Dairy products, 40.7 percent from Red meat and 13.8 % did not know. 82.4% of respondents have heard about Iodine whereas 17.6 % of the respondents did not hear about Iodine. A study done by Sakhile *et al* in Tibet¹¹ in 2014 found the association between educational level (p= 0.002), monthly income (p= 0.008) were significantly associated with knowledge level which are similar to the findings of present study. In contrast to the findings of present study, a study done by Ghimire *et al* in 2013 in Nepal⁹ found no significant association between socio-demographic characteristics: family income, occupation and type of family and knowledge.

CONCLUSION

More than half of the pregnant women had poor level of knowledge and awareness about micronutrients. Level of knowledge was significantly associated with socio-demographic characteristics. Nutrition intervention such as nutrition education should be given for the community particularly for the pregnant mothers concerning nutrition during pregnancy to increase the nutritional knowledge. School Health program should be prioritized and implemented in the district and local level to improve the nutritional knowledge and status of pregnant women. Further studies in field of micronutrients are recommended at local and national level to assess the knowledge and practice for better nutrition of the mother.

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