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Nutritional Status (BMI) Association with Anemia among Reproductive age Group of Women Attending Karnali Academic of Health Sciences, Jumla

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Abstract:

Introduction: Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child, reproductive age group of women and maternal health. In the past few years, the issues of Reproductive Health have been increasingly perceived as social problems; they have emerged as a matter of increasing concern throughout the developed and developing countries. Nutritional status (BMI) and Anemia, in every form, presents significant threats to human health. Today the world faces a double burden of malnutrition that includes both under nutrition and overweight, especially in developing countries like Nepal.

Methods: A prospective cross-sectional study was conducted among the reproductive age group women attending for needful treatment in Medical and Maternal OPD of Karnali Academic of Health Sciences, Jumla. A total of 210 reproductive age group women from were participated in this study. Before collecting the data, the consent was taken from the participants.Data were collected from a semi-structured questionnaire and analyze by using SPSS software (20.0 Version). A chi square test was used to show the relationship between BMI and anemia. For Haemoglobin measurement Sahli's (Acid Haematin) method was used.

Results: Out of 210 participated, most of the women are 20 to 28 years of age 86 (40.9%) and least on 40 to 49 years of age 20 (9.53%). Most of the participants are non-anemic 183(87.10%) and those who are in anemic

23(10.95%) falls under mild degree of anemia. The most of the age group are non-anemic in which age 20 to 29 years 131 (87.92%) and those who are anemic age more or equal to 30are the least anemic 2(8.34%)., it was found that there was no significant relationship (P>0.420).In the relationship of BMI with age group 30 to 39 years shows 13(8.73%) of obesity, 27(18.12%) of pre-obesity and 43(28.85%) were under weight, whereas age group less or equal to 29 years shows least degree of BMI 5(20.84%) obesity, 4(16.66%) pre-obesity and only 5(20.84%) falls under weight., it was found that there was no significant relationship (P>0.139). Similarly the relationship of anemia and BMI, 27 participant show the relationship of anemia and BMI in which 5(18.51%) obesity, 2 (7.42%) pre-obesity and 3(11.11%) falls under weight. Out of 183 non-anemic participant 15(18.20%) obesity, 38(20.77%) pre-obesity and 61(33.33%) under-weight where result found to be highly significant association of degree of anemia with BMI (P>0.006).

Conclusion: The finding of this present study concluded that majority of the respondent were in 20 to 29 years of age 86 (40.9%) with non-anemic 183 (87.10%) and majorities anemic participants 23 (10.95%) falls under mild degree of anemia. The study also reveals that there is no significant relationship of anemia with the age and as relationship of nutrition status (BMI) with age of the respondents respectively (p- 6.420 and 0.139). But the relationship of anemia with the nutritional status (BMI) of the respondents was very highly significant (p-0.006).

KeyWord: BMI, Anemia, Reproductive Age group of Women, OPD, KAHS.

I. Introduction

Nutrition is the intake of food, considered in relation to the body's dietary needs. Good nutrition, an adequate, well balanced diet combined with regular physical activity is a cornerstone of good health. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development, and reduced productivity. [1] 'Anemia' refers to low hemoglobin level or less number of red blood cells [2]. It is one of the most common nutritional disorders and it has public health importance in developing countries like Nepal [3,4]. Globally, anemia is a public health problem affecting people in both developed and developing countries with bad consequences of human health as well as social and economic development [5,6].

Anemia is a critical health concern because it affects growth and energy levels adversely. It damages immune mechanisms and is also associated with increased morbidity. It occurs at all age groups, but is more prevalent in pregnant women and children [5,7]. Especially, young children and reproductive age group women from low income families have a higher risk for developing anemia due to iron deficiency that occurs as a result of high demand for iron during the period of rapid growth [8]. Globally, anemia affects 1.62 billion (24.8%) of the population and an estimated 36% of developing world's population suffers from this disease.[4]. In developing countries, the prevalence of anemia among reproductive age is high, and it is classified as severe public health problem [8]. Lack of awareness, low educational status, poor nutritional practices and unhealthy food habits, low iron bioavailability of the diet, decreased physical activities, malaria and parasitic infestations are additional factors associated with lower hemoglobin (Hb) level in this age group so, hemoglobin concentration is an important diagnostic indicator for the wellbeing of an individual [9,10,11].

The total population of Jumla is 108,921 in 2011, female population 54,023 and males population 54898 males, slightly outnumbering than females. Jumla's population 25,757, women of reproductive age group. In which anemia is most common in reproductive age group women and school going adolescent girls [12]. Although anemia remains a widespread public health problem in most developing countries, and even developed countries, there are very few studies on the prevalence and severity of anemia among reproductive age group women in Nepal. Because of its impact on cognitive development and physical growth, studies on the magnitude of anemia among reproductive age group women have paramount importance. Therefore, the main aim of the present study was to determine the prevalence and severity of nutritional status (BMI) and anemia on reproductive age group women.

II. Methods:

2.1 Study design

A descriptive cross-sectional study was used the nutritional status (BMI) association with anemia among reproductive age group of women attending Karnali Academic of Health Sciences, Jumla.

2.2 Study method

The study was quantitative.

2.3 Description of study design and method

Cross sectional study design is carried to find out the nutritional status (BMI) association of anemia among reproductive age group of women attending Karnali Academic of Health Sciences, Jumla. The respondents were the reproductive age group who are attending medical and maternal OPD of KAHS, Jumla were selected. Then face to face interview is carried to collect information.

2.3 Study site and its justification

The medical and maternal OPD of KAHS was selected. It is one of the highest altitude medical university and prevalence of anemia in this region is high.

2.4 Study population

The study population was the reproductive age group women.

2.5 Sampling unit

The sample unit was respondents of reproductive age group women attending medical and maternal OPD of KAHS, Jumla

2.6 Sample size

Sample size of the study was calculated by using Cochran's formula

n = Z 2 (pq) / e2

Where,

Z= standard normal variant

P=14%

q=100-p=86%

e=allowable error=5%

n=185

Non-response rate in this study was 10%=204

However in round figure we collected data from 210 participants

.2.8 Sampling technique

Complete enumeration was done during 2 weeks (1st June 2018to 15th June 2018)

2.9 Inclusion and Exclusion criteria

Reproductive age group women were enrolled.Those respondents who were not present during data collection were excluded.

2.10 Data collection technique

Data was collected by face-to-face interview, which comprised of demographic information, anemia testing and nutritional status (BMI). Interview was around 30 minutes for each individual.

2.11 Data collection tool

Initially a consent form was given to respondents. The consent form was prepared in both English and Nepali language. Data was collected using standardized guideline for anemia and BMI. Additional data on associated factors was collected using pre-testested pre-designed questionnaire.

2.12 Data collection Procedure

The objective of the study was made clear to the participant and informed consent was taken. Participant was assured that their confidentiality of information. Data collection by face-to-face interview collected using standardized guideline for anemia and BMI.

2.13 Statistical Analysis

Data entry was done in Epi -data 3.1 version. After collection of data, data was checked out systematically then edited, coded and entered. A data analysis was done in IBM SPSS 16.0 version. Descriptive statistics in terms of frequency and percentagewas used to present the data and chi – square test was applied to test the association.

2.14 Ethical consideration

Ethical clearance was taken from Ethical Review Board of Nepal Health Research Council (NHRC), Ramshah Path, Kathmandu (Ref. No2743), Nepal. The objectives of the study were shared with each respondents and consent was taken. Participation in this study was voluntary. The respondents were fully informed of their rights to decline or withdraw from participation in the study if they desired. Confidentiality of the information was ensured and maintained.

2.15 Experimental procedure:

For BMI:

Height was taken with the help of measuring tape to the nearest 0.1 cm. The weight was recorded to the nearest 0.5 kg using portable weighing machine and wearing minimum clothing. Body mass index (BMI) was calculated by using the standard formula.

BMI= weight (in kg)/ height2 (in meters).

A cut off point of less than18.5 kg/m2 is used to define underweight, 18.50 to 24.99 kg/m2 normal, more 25.00 to 29.99 kg/m2 pre-obese and more than 30.00 kg/m2 is obese [13].

For Anemia:

Method: Sahli's (Acid Haematin) Method

Principle: Blood was added to 0.1 N hydrochloride acid hemoglobin is converted to brown color acid hematin. The resulting color after dilution is compared with standard brown reference blocks of Sahli's haemoglobinometer.

Specimen: Capillary blood thoroughly mixed with anti-coagulated (EDTA or double oxalated) venous blood.

Requirements: Standard brown glass mounted on comparator, Graduated tube, Hb% pipe He (0.02ml), 0.1 N hydrochloric acid, Distilled water and Pasteur pipetle.

Procedure:

a. Using a pasture pipette add 0.1 N hydrochloric acid in the tube up to lowest mark (20% mark).

b. Draw blood up to 20 ml mark in HD pipette. Adjust the coloum, carefully without bubbles wipe excess of the blood on the slide of the pipette by using a dry piece of cotton.

c. Transferring blood to acid in the gradated tube, ose the pipette well, mix the reaction mixture and allow the tube to stand for at least 10 minutes.

d. Dilute the solution with distilled water by adding few drops at time carefully and by mixing the reaction mixture, until the color matches with the glass plate in comparator.

e. The matching should be done only against natural light. The level of fluidnoted its lower meniscus and the reading corresponding to level on the scale is recorded in g/dl.

Anemia was defined as Hb<12 g/dl. Severe anemia <7 g/dl, Moderate anemia 7-9.9 g/dl and mild anemia 10-11.9 g/dl respectively. Normal values Men 13-18g/dl, Women 12-16.5 g/dl, Children (up to 1 years) 11-13 g/dl, Children (up to 12 years) 11.5-14.5 g/dl and Infants (full term cord blood) 13-19.5 g/dl. [14].

III. Results:

Out of 210 reproductive age group participated, most of the women fall under 20 to 29 years of age 86 (40.9%) and least on 40 to 49 years of age 20 (9.53%). Out of 210 participants most of the participants are non-anemic 183(87.10%) and those who are in anemic 23(10.95%) falls under mild degree of anemia.(Table: 1 and 2)

Table 1: Age wise distribution of the respondents.

Age (Complete year)	Number	Percentage (%)
15-19	64	30.47 %
20-29	86	40.95 %
30-39	40	19.05 %
40-49	20	9.53 %
Total	210	100 %

Table 2: Status of anemia of the respondents.

Anemia	Number	Percentage (%)
Non anemia	183	87.10%
Mild anemia	23	10.95%
Moderate anemia	4	1.90%
Severe anemia	0	0.0%
Total	210	100%

Among the 210 participants, the most of the age group are non-anemic in which age 20 to 29 years 131 (87.92%) and those who are anemic age more or equal to 30are the least anemic 2(8.34%)., it was found that there was no significant relationship (P>0.420).In the relationship of BMI with age group 30 to 39 years shows 13(8.73%) of obesity, 27(18.12%) of pre-obesity and 43(28.85%) were under weight, whereas age group less or equal to 29 years shows least degree of BMI 5(20.84%) obesity, 4(16.66%) pre-obesity and only 5(20.84%) falls under weight., it was found that there was no significant relationship (P>0.139). (Table 3 and 4)

Table 3: Relationship of anemia with age of the respondents.

Age of the respondents	Anemia		Total	p-value
	Non anemia	Anemia		
15-19	30 (81.08%)	7 (18.92%)	37 (100%)	0.420
20-29	131 (87.92%)	18 (12.08)	149 (100%)	
More or equal to 30	22 (91.66%)	2 (8.34%)	24 (100%)	
Total	183	27	210	

Table 4: Relationship ofnutritional status (BMI) with age of the respondents.

Age of the respondents	Nutritional Status (BMI)					
	Obese	Pre-Obese	Normal weight	Under weight	Total	p- value
Less or equal to 29	5(20.84%)	4(16.66%)	10(41.66%)	5(20.84%)	24(100%)	0.139
30-39	13(8.73%)	27(18.12%)	66(44.30%)	43(28.85%)	149(100%)	
40-49	2(5.40%)	9(24.32%)	10(27.03%)	16(43.25%)	37(100%)	
Total	20	40	86	64	210	

Similarly the relationship of anemia and BMI, 27 participants show the relationship of anemia and BMI in which 5(18.51%) obesity, 2 (7.42%) pre-obesity and 3(11.11%) falls under weight. Out of 183 non-anemic participants 15(18.20%) obesity, 38(20.77%) pre-obesity and 61(33.33%) under weight where result found to be highly significant association of degree of anemia with BMI (P>0.006) (Table 5).

Table 5: Relationship of anemia with nutritional status (BMI) of the respondents.

Anemia	Degree of Nutritional Status (BMI)					
	Obese	Pre-Obese	Normal weight	Under weight	Total	p- value
Anemia	5(18.51)	2(7.42%)	17(62.92%)	3(11.11%)	27(100%)	0.006
Non anemia	15(8.20%)	38(20.77%)	69(37.70%)	61(33.33%)	183(100%)	
Total	20	40	86	64	210	

IV. Discussion:

Nutritional status is a common problem among reproductive age group. A previous study on association of anemia with BMI in paramedical students of the remote and rural high land of Mid-Western Nepal shows that most of the participants fall less than 21 years, the prevalence of anemia was 20.8%, there was no significant association between anemia and BMI (P>0.05). Out of 20 anemic students both male and female were equally suffering from mildly anemic and moderately anemic 75% and 25% respectively. One fifth of the students (19.8%) were under weight and a very few (8.3%) were pre obese. Similarly the age and anemic status of the students were found to be insignificant association with BMI (P>0.05). [15]

Agrawal et al found higher prevalence of anemia among females (65.11%) [16].Kalyanshetti et al found prevalence of anemia among females was 59% while in contrast Verma et al find prevalence of anemia among young females 29.32% and in males it was 19.53% in 20-29 years age group [17,18]. Sah et al found prevalence of anemia among females to be 21.77% [19].

Gargade et al found similar finding of higher prevalence of anemia among normal weight (55.2%), in underweight (27.6%), in overweight (13.6%) in obese (3.4%) [20]. While Metha found anemia more prevalent among underweight students (63.33%) and overweight students (0.83%) have less prevalence of anemia while in normal weight student's prevalence of anemia was 6.67%.20 Pandey et al found prevalence of anemia among underweight (60%), normal weight (27.5%) overweight (12.5%) [19].

Gupta et al found higher prevalence of anemia among underweight (91.4%) in normal weight (83.6%) and in overweight (73.3%) [21]. Pal et al found higher prevalence among underweight males (62.5%), females (80.65%), among normal weight males (45.98%) females (62.67%) and overweight/obese males (19.05%) females (25.0%) [22]. Waseem et al found anemia in underweight (44.9%), in normal weight (23.67%) while in overweight it was (10%) [23]. Sinha et al found prevalence of anemia among undernourished women (76.06%) than normal weight (75.28%) in overweight women (66.67%) means negative correlation between anemia and BMI [24].

In our study most of the respondents most of the respondents are 20-29 years 40.95%, prevalence of anemia is 12.85% and there is highly significant between anemia and BMI (p=0.006) as above study. Most of the respondents fall under mild and moderate anemia (12.5%) and was under-weight 43 (28.85%), pre-obese 27 (18.12%) and obese 13 (8.73%). It also so highly insignificant association with respect with age and BMI status (p=0.139) and age and anemia (p=0.420)

V. Conclusion:

The finding of this present study concluded that majority of the respondent were in 20 to 29 years of age 86 (40.9%) with non-anemic 183 (87.10%) and majorities anemic participants 23 (10.95%) falls under mild degree of anemia.

The study also reveals that there is no significant relationship of anemia with the age and as relationship of nutrition status (BMI) with age of the respondents respectively (p- 6.420 and 0.139). But the relationship of anemia with the nutritional status (BMI) of the respondents was very highly significant (p-0.006).

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