Effect of Nutrition Education on Hemoglobin Level in Pregnant Women: A Quasi Experimental Study

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Introduction

- Nutrition education focus on increasing the diet diversity and consumption of adequate amounts of balanced nutrients[1]
- Nutritional knowledge during pregnancy is crucial for the well being of both mother and fetus[2].
- Inadequate diet during pregnancy can lead to various consequences such as anemia. Adequate nutrition is crucial part of pregnancy that should not be neglected[3].
- Prevalence of anemia among pregnant women has been stagnant in the past decade (48% in NDHS 2011 vs 46% in 2016) in spite of the provides iron and folic acid which are the essential nutrients lacking in their diet[4].

Objectives

- The primary objective of the study was to assess the effect of nutrition education and iron rich food based diet plan on Hb levels of anemic pregnant women.
- The secondary objectives of the study was to assess the effect of nutrition education and iron rich food based diet plan on maternal nutritional knowledge, dietary intake and nutritional status in pregnant women.

Methods

- A quasi-experimental study design was conducted in Tribhuvan University Teaching Hospital, Kathmandu, Nepal.
- Pregnant women who are within 2nd trimester(gestational age from 13 to 28 weeks), attending during ANC visits who were willing to participate and with mild and moderate anemic were included in the study
- Sample size was 115 (58 participants in Intervention group and 57 participants in control group respectively) at 5% level of significance and 90% power.

Tools and procedure

- The baseline data collection technique was interview using semi-structured questionnaire for socio-demographic information, dietary intake and maternal nutritional knowledge.
- Anthropometric measurements like height, weight and body mass index (BMI), and biochemical assessment such as hemoglobin level estimation were done.
- After base line data collection was completed, participants were assigned to either the control or intervention group purposively.
- End line data collection was done after ten weeks of nutrition education intervention
- Chi-square test and Independent sample t-test was used. Data was analyzed with StataSE version 13.0.

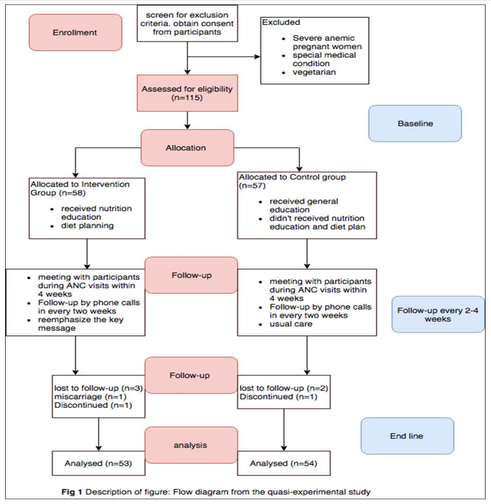


Fig 1 Description of figure: Flow diagram from the quasi-experimental study

Results

Table 1.Comparison of outcome variables for base line and end line in control and intervention groups

Variables	Control group (n=54)	Intervention group(n=53)	
	Mean ± SD	Mean ± SD	p value[1]
Blood Hb level gm/dl			
Baseline	10.18±0.62	9.99 ±0.87	0.209
End line	10.35 ±0.64	10.55 ±0.79	0.144
Change	0.16 ±0.82	0.56 ±0.40	0.002*
Maternal nutritional Knowledge score			
Baseline	10.31±5.17	9.24±4.67	0.200
End line	11.37±5.17	17±3.325	<0.001
Change	1.05±6.59	8.26±4.57	<0.001*
Weight, kg			
Baseline	54.87 ±8.81	52.68 ±7.43	0.167
End line	56.01 ±8.25	56.01 ±7.14	0.702
Change	1.79 ±9.84	3.28 ±8.31	0.401
Height, cm	154.11±5.20	153.46±5.75	0.541
BMI, kg/m2			
Baseline	22.87 ±3.86	22.18 ±3.15	0.322
End line	23.83 ±3.27	23.77 ±2.62	0.921
Change	0.95 ±4.92	1.58 ±2.80	0.419

[1] Independent sample t-test. BMI=Body mass index (kg/m^2)
*statistically significant is at p<0.05

Picture 1 & 2. Nutrition education to pregnant women.

Figure 2. Comparison of BMI in pregnant women at base line and end line intervention

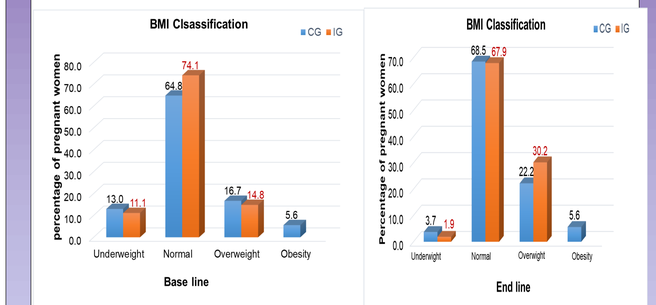


Figure 3. Comparison of maternal nutritional knowledge in pregnant women at base line and end line.

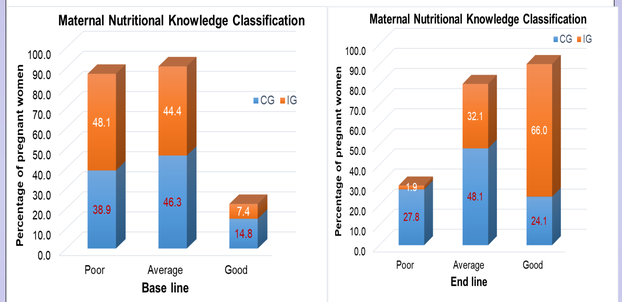
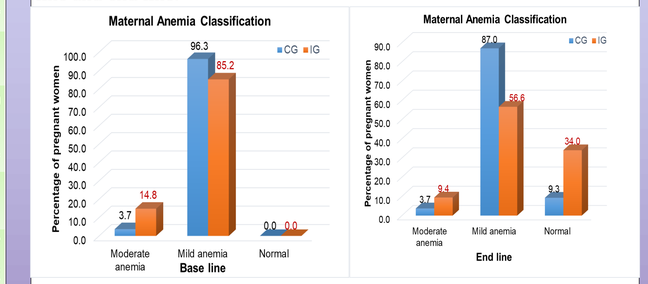


Figure 4. Comparison of maternal anemia in pregnant women at base line and end line.



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Key findings

- Majority of pregnant women in both intervention and control groups had mild anemia (9-10.9 gm/dl) at baseline (85.2% and 96.3% respectively).
- After intervention, one third (34%) of pregnant women in intervention group and 9.3% in control group had normal level of hemoglobin (>11gm/dl).
- At the end of 10 weeks, the change in hemoglobin concentration was significantly higher in the intervention group compared to control group.
- There was significance difference in the nutritional knowledge score of pregnant women in the intervention group over control group (p<0.001)
- There was significantly higher intake of red meat, fish and liver (p<0.001), vitamin C rich fruits (p=0.006), dairy products (p=0.013), eggs (p=0.016) and dark green vegetables (p<0.001) in the intervention compared to control group.

Conclusions

- The provision of nutrition education and iron rich food based diet plan for pregnant women was found to be associated with improved hemoglobin level.
- Provision of nutrition education and iron rich food based diet plan was significantly associated with improved nutritional knowledge score and improved dietary intake.

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