

1 **Comparativestudy to assess the placental weight in normal mothers and anaemic**
2 **mothers during intranatal period in selected hospitals.**

3
4
5 **ABSTRACT**

6 **Background:**Despite the fact that anaemia during pregnancy is the most prevalent and
7 significant health problem in impoverished nations, anaemia has a negative impact on the
8 placenta and foetal development. The placenta is a growing organ that provides nutrition,
9 oxygen, and eliminates excretory wastes for the foetus while also acting as a protective
10 barrier throughout pregnancy.If the placenta is compromised by anaemia, it has a negative
11 impact on the foetus's growth.

12 **Methods and material:** Quantitative Research Approach was used and Non-Experimental,
13 correlational research design was used.

14 **Result:** The result of the study shows that 93% normal mothers had average condition of
15 placental weight, 2% normal mothers had good condition of placental weight while in
16 anaemic mothers it was found that 30 percent had average condition of placental weight,
17 73.3% normal mothers had average condition of fetal outcome, 26.7% normal mothers had
18 good condition of fetal outcome while in anaemic mothers it was found that 93.3% percent
19 had average condition of fetal outcome, 06.7% had good condition of fetal outcome.

20 **Conclusion:** The study concludes that there is lack generalization number of sample.
21 Therefore, study with more samples might be useful to find out the findings. Proper health
22 education should be given to mothers to improve their knowledge regarding proper
23 nutritional care which will prevent from anaemia.

24 (Key words: anaemia, placental outcome, fetal outcome, intranatal)

25
26 **BACKGROUND**

27 The placenta is a feto-maternal organ made up of a maternal component, an endometrium-
28 derived decidua basalis, and a foetal component, chorion frondosum develops from
29 chorionicsac¹.At full term the human placenta consists of: - 1. Fetal surfaces which is shiny,

30 gray and translucent enough, due to the color of the underlying maroon villous tissue; 2.
31 Maternal surface which is, finely granular, mapped into 15-20 cotyledons limited by placental
32 septum. 3. Umbilical cord; insertion is usually central but may vary in some specimens
33 like battledore/marginal, velamentous or eccentric.^(2, 3)

34 In different types of hypoxic stress, such as high altitude and maternal iron deficiency
35 anaemia, the foetal vasculature of the human placenta adapts uniformly. Hypoxic conditions,
36 such as maternal iron deficiency anaemia, cause increased capillarization of term villi. The
37 main adaptation to hypoxia is dilatation of the capillary sinusoid, which is accompanied by
38 thinning of the villous membrane. There is a relative hypoxia in maternal anaemia, which
39 could be the main reason in syncytia trophoblast proliferation and syncytium thickness
40 growth.⁴ Anemia is a medical disorder characterised by a low level of haemoglobin in the
41 blood. It is a condition in which a person's haemoglobin concentration is lower than normal
42 for his or her age, gender, and environment, resulting in a reduction in the blood's oxygen
43 carrying capability.⁵ Anemia during pregnancy is defined as a haemoglobin concentration of
44 less than 11 g/dl, according to the World Health Organization (WHO), which ranges from
45 mild to severe. WHO classifies anemia in pregnancy based on hemoglobin level as 10.0-
46 10.9g/dl (mild anemia), 7-9.9g/dl (moderate anemia) and <7g/dl (severe
47 anemia)⁽¹⁴⁾. Pregnancy causes an increase in iron requirement, which climbs from 2.5 mg per
48 day in the first trimester to 6.6 mg per day in the third trimester. Women will get anaemia if
49 demand and supply are not balanced.⁶

50 Anemia is caused by a variety of factors, but iron deficiency is regarded to be the primary
51 cause in poorer nations. The incidence of anaemia has often been utilised as an alternative for
52 iron deficiency anaemia in Sub-Saharan Africa, where iron deficiency anaemia
53 (IDA)⁷. Anemia in pregnancy is most usually caused by a lack of iron or folic acid in the diet;
54 other kinds include chronic illness anaemia, hemoglobinopathies, inherited spherocytosis or
55 paroxysmal nocturnal hemoglobinuria, drug-induced anaemia, and aplastic
56 anaemia.⁶ Pregnancy anaemia can be asymptomatic, and it can be detected with regular
57 testing. The signs and symptoms are frequently nonspecific, with the most prevalent being
58 weariness. Women may also complain of lethargy, reduced mental alertness, pallor, dyspnea,
59 weakness, headaches, palpitations, and dizziness^(6,8).

60

61 **METHODS**

62 A non-experimental research design was used in this study. 60(30 normal mothers and 30
63 anemic mothers) purposively selected intranatal mothers in Wardha district, and in this study
64 the purposive sampling technique was used. At the month of June 2020, data was collected
65 by using structured questionnaire. During the intranatal time of a designated area, the
66 investigator approached normal and anaemic mothers and described the goal of the study as
67 well as how it would benefit them. Her questioned about their desire to take part in the study
68 and obtained their consent. Soon after the delivery the placenta was collected. The weight of
69 the placenta was checked as well as the fetal outcome, each sample required mean time of 30
70 minutes to complete the placenta and fetal assessment.
71 The tool was validated by experts from obstetrics and gynaecological nursing, the tool was
72 developed after the investigator updated theoretical risk about anaemia. The investigator's
73 own experience, theoretical knowledge, and guidance from specialists, as well as a review of
74 literature, all contributed to the development of the tool needed for the study. A structured
75 questionnaire was developed to determine the condition of placenta and baby's weight among
76 normal as well as mother with anemia. English expert has revised the tools and later it is
77 translated in Marathi language without changing any meaning.

78

79 **STATISTICAL ANALYSIS**

80 The study was analyzed by using descriptive and inferential statistics both. The percentage-
81 wise distribution of the intranatal mothers' demographic characteristics was estimated using
82 descriptive statistics to describe the basic elements of the data in a study and inferential
83 statistics to make conclusions from our data to more general conditions. Students unpaired t-
84 test, one-way ANOVA, Pearson' correlation coefficient, and reliability analysis were the
85 statistical tests utilised to analyse the results.

86 Anadequate sample was selected from the study population of 60 (30 normal and 30 anemic
87 mothers) subjects who were in AVBRH labour room. The information was gathered in order
88 to classify sample characteristics such as age, parity, family, education, religion, HB%, and
89 diet.

90

91

92 **RESULTS**

93 **SECTION I:PERCENTAGE WISE DISTRIBUTION OF PRIMIGRAVIDA** 94 **MOTHERS ACCORDING TO THEIR DEMOGRAPHIC CHARACTERISTICS**

95 **Table.no.1 Percentage wise distribution of primigravida mothers according to their**
 96 **demographic characteristics.**

97

n=60

Demographic variables	Normal mothers		Anemic mothers	
	Frequency	Percentage	Frequency	Percentage
Age				
18-22 years	08	26.7%	08	26.7%
23-27 years	10	33.3%	08	26.7%
28-32 years	10	33.3%	08	26.7%
33- 37 years	02	06.7%	06	20.0%
Parity				
Primigravida	10	33.3%	08	26.7%
Multipara	20	66.7%	22	73.3%
Family				
Joint	12	40%	08	26.7%
Nuclear	18	60%	22	26.7%
Education				
Primary school	02	06.7%	00	00.0%
Middle school	14	46.7%	12	40.0%
High school	08	26.7%	10	33.3%
Higher secondary school	04	13.3%	08	26.7%
Graduate	02	06.7%	00	00%
Religion				
Hindu	26	86.7%	28	93.3%
Muslim	04	13.3%	02	06.7%
Christian	00	00%	00	00%
Buddhist	00	00%	00	00%
HB%				
8-10%	00	00%	17	56.7%
11-13%	28	93.3%	13	43.3%

14 and above%	02	06.7%	00	00%
Diet				
Vegetarian	22	73.3%	28	93.3%
Mixed	08	26.7%	02	06.7%

98

99 The above table shows that, according to age group in normal mothers 26.7 percent belongs
100 to 18-22 years of age,33.3% belongs to 23-27 years, 33.3% belongs to 28-32 years and 6.7%
101 belongs to 33-37% years of age. While in anemicmothers 26.7 percent belongs to 18-22 years
102 of age,26.7% belongs to 23-27 years, 26.7% belongs to 28-32 years and 20% belongs to 33-
103 37% years of age.

104 According to parity in normal mothers, 33.3% belongs to primigravida, 66.7% belongs to
105 multipara. While in anemic mothers 26.7% belongs to primigravida, 73.3% belongs to
106 multipara.

107 According to family in normal mothers, 40% belongs to joint family, 60% belongs to nuclear
108 family. While in anemic mothers, 26.7% belongs to joint family, 26.7% belongs to nuclear
109 family.

110 According to education in normal mothers, 6.7% belongs to primary school,46.7% belongs to
111 middle school, 26.7% belongs to high school, 13.3% belongs to higher secondary school and
112 6.7% belongs to graduate. While in anemic mothers, 0% belongs to primary school,40%
113 belongs to middle school, 33.3% belongs to high school, 26.7% belongs to higher secondary
114 school and 0% belongs to graduate.

115 According to religion in normal mothers, 86.7% belongs to Hindu religion,13.3% belongs to
116 Muslim religion and none of them were from Christian and Buddhist religion. While in
117 anemic mothers, 93.3% belongs to Hindu religion,6.7% belongs to Muslim religion and none
118 of them were from Christian and Buddhist religion.

119 According to Hb in normal mothers, 0% were 8-10%, 93.3% were 11-13% and 6.7% were 14
120 and above %. While in anemic mothers, 56.7% were 8-10%, 43.3% were 11-13% and 0%
121 were 14 and above %.

122 According to diet in normal mothers, 73.3% were taking vegetarian diet, 26.7% were taking
123 mixed diet. While in anemic mothers, 93.3% were taking vegetarian diet, 6.7% were taking
124 mixed diet.

125

126 **SECTION-II: ASSESSMENT OF PLACENTAL WEIGHT AND FETAL OUTCOME**
 127 **IN NORMAL MOTHERS AND ANEMIC MOTHERS**

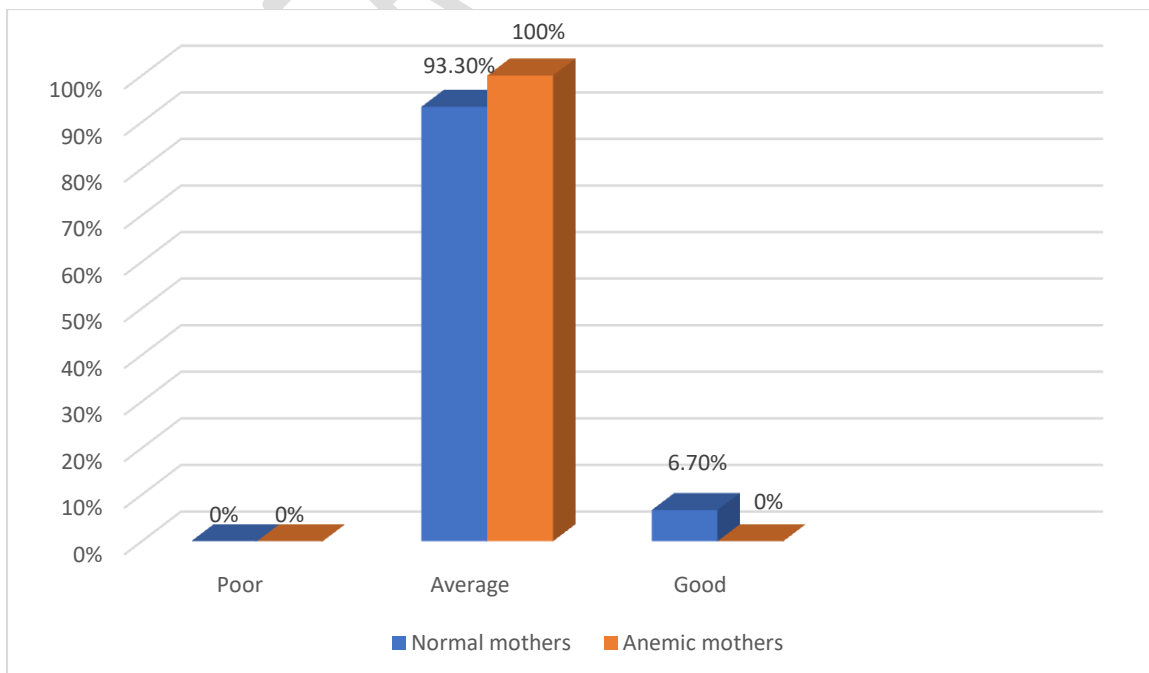
128 **Table no.2.1:Assessment of placental weight in normal mothers and anemic mothers.**

129 **n=60**

Condition of placental weight	Normal mothers		Anemic mothers	
	Frequency	Percentage	Frequency	Percentage
Poor	00	00%	00	00%
Average	28	93.3%	30	100%
Good	02	06.7%	00	00%
Minimum score	15		11	
Maximum score	21		20	
Mean score	17.80± 1.540		16.23± 2.661	

130

131 In assessment of placental weight it shows that the ninety three percent (93%) normal mothers
 132 had average condition of placental weight while 2 % normal mothers had good condition of
 133 placental weight. The score of the minimum was 15 and the maximum was 21, with a mean
 134 score of 17.80 while the standard deviation was 1.540 in normal mothers. While in
 135 anemic mothers it was found that 30 percent had average condition of placental weight. The
 136 minimum score found was 11 and the maximum score found was 20, the mean score was
 137 16.23 while the standard deviation was 2.661 in anemic mothers.



138

139 **Graph no.1. Assessment of placental weight in normal mothers and anemic mothers.**

140

141 **ASSESSMENT OF FETAL OUTCOME IN NORMAL MOTHERS AND ANEMIC**
142 **MOTHERS**

143 **Table.no.2.2 Assessment of fetal outcome in normal mothers and anemic mothers.**

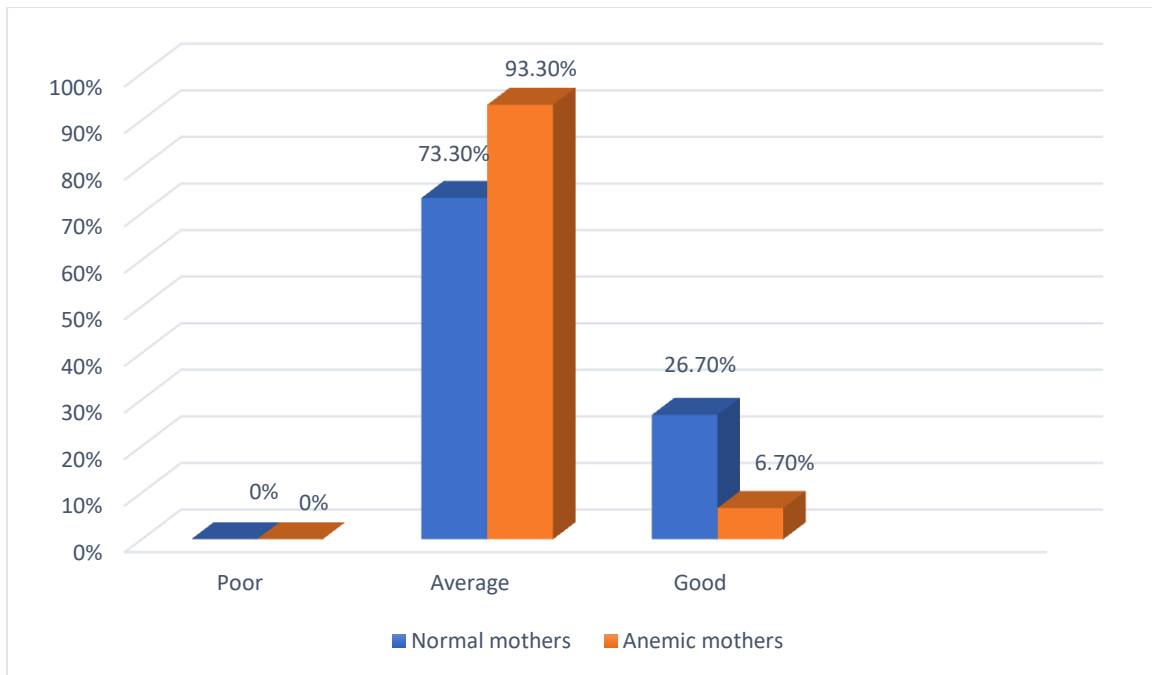
144

n=60

Condition of fetal outcome	Normal mothers		Anemic mothers	
	Frequency	Percentage	Frequency	Percentage
Weight of the baby				
Poor	00	00%	00	00%
Average	22	73.3%	28	93.3%
Good	08	26.7%	02	06.7%
Minimum score	06		06	
Maximum score	13		11	
Mean score	9.53±1.525		8.47±1.279	

145

146 In assessment of fetal weight it shows that the seventy three point three percent (73.3%)
147 normal mothers had average condition of fetal outcome while 26.7% normal mothers had
148 good condition of fetal outcome. The score of the minimum was 06 and the maximum was
149 13, with mean score of 9.53 while the standard deviation was 1.525 in normal mothers. While
150 in anemic mothers it was found that 93.3% percent had average condition of fetal outcome,
151 while, 06.7% had good condition of fetal outcome. The minimum score found was 06 and the
152 maximum score found was 11, the mean score was 8.47 while the standard deviation was
153 1.279 in anemic mothers.



154

155 **Graph no.2. Assessment of fetal outcome in normal mothers and anemic mothers.**

156

157 **SECTION-III: COMPARISON OF THE PLACENTAL WEIGHT AND FETAL**
 158 **OUTCOME IN NORMAL AND ANEMIC MOTHERS**

159 **Table.no.3.1. Comparison of the placental weight in normal and anemic mothers.**

160

n=60

	Mean	Frequency	Std. deviation	df	t value	p-value
Normal mothers	17.80	30	1.540	29	2.987	.006<
Anemic mothers	16.23	30	2.661			0.05 S

161

162 **Table.no.3.2. Comparison of the fetal outcome in normal and anemic mothers.**

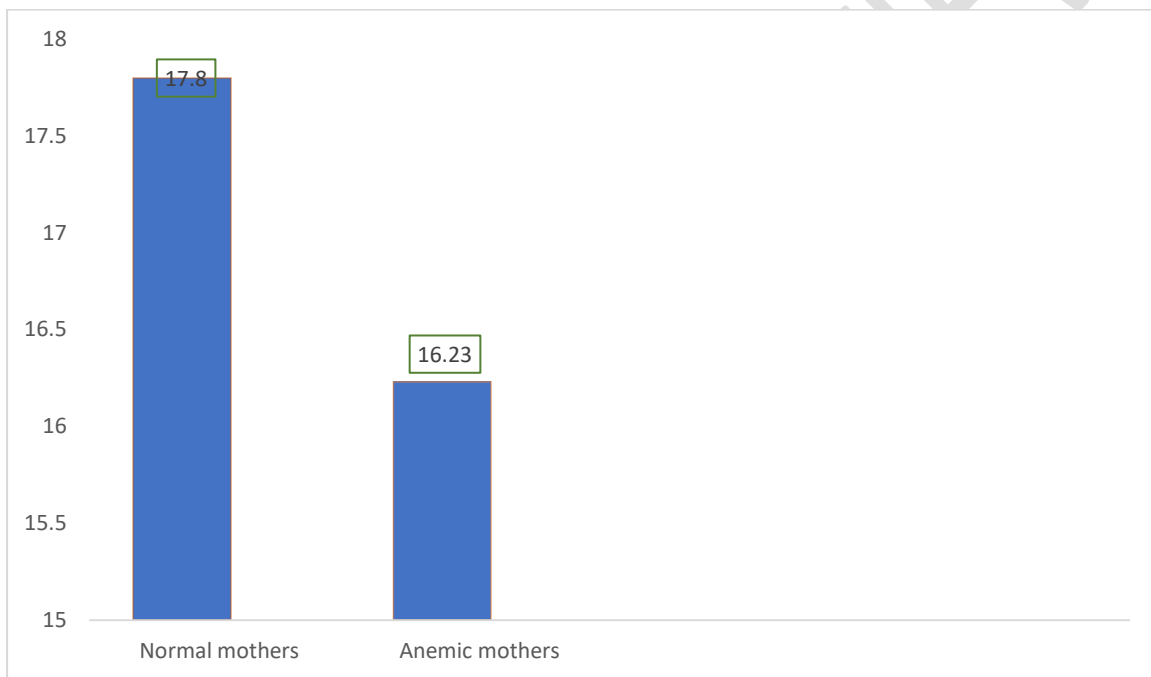
163

n=60

	Mean	Frequency	Std. deviation	df	t value	p-value
Normal mothers	9.53	30	1.525	29	2.605	.014<
Anemic mothers	8.47	30	1.279			0.05 S

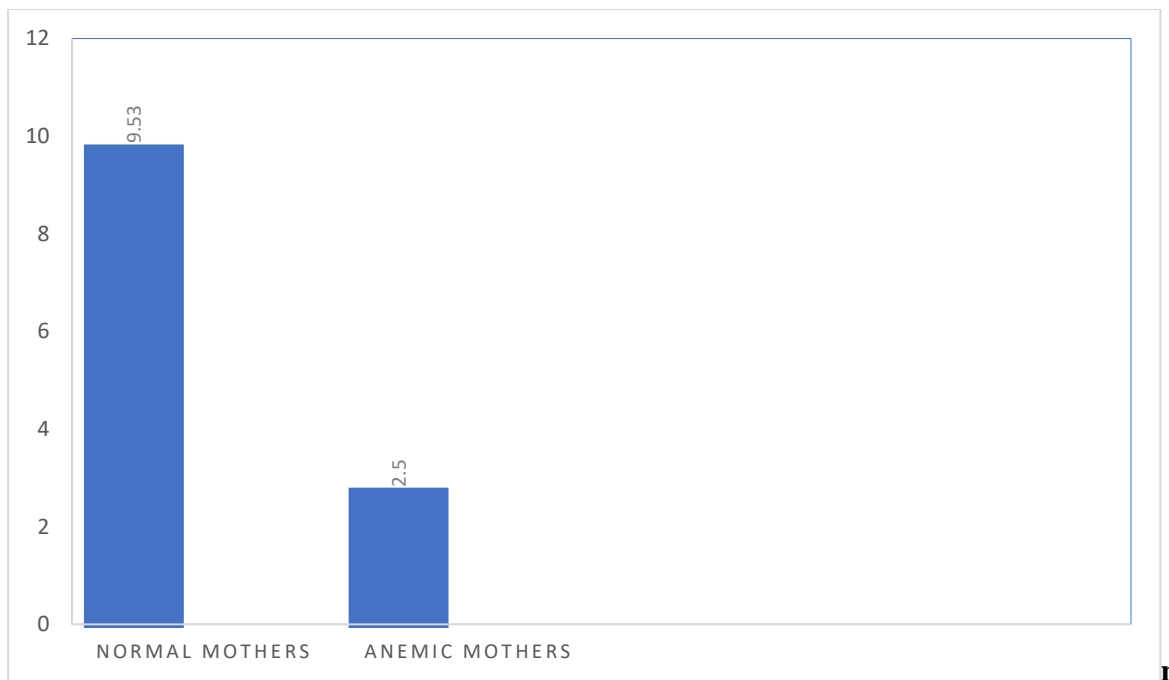
164

165 Table no. 3.1 shows that the mean score of normal mothers is 17.80 while the anemic
166 mothers is 16.23 and the standard deviation for normal mothers is 1.540 and anemicmothers
167 is 2.661. the degree of freedom found was 29 and the p value found is .006 which is less than
168 the p value 0.05 which is significant and also, table no. 3.2 states the comparison of the fetal
169 outcome in normal and anemic mothers, that the mean score of normal mothers is 9.53 while
170 the anemic mothers is 8.47 and the standard deviation for normal mothers is 1.525 and
171 anemicmothers is 1.279. the degree of freedom found was 29 and the p value found is .014
172 which is less than the p value 0.05 which is significant hence the alternative hypothesis (H1)
173 is accepted that, there may be a significant difference in placental weight and fetal outcome in
174 normal mothers and anaemic mothers.



175

176 **Graph no.3.1 Comparison of the placental weight in normal and anemic mothers.**



177

178 **Graph no.3.2 Comparison of the fetal outcome in normal and anemic mothers.**

179 **DISCUSSION**

180 In the present study, the assessment of placental weight shows that the ninety three percent
 181 (93%) normal mothers had average condition of placental weight while 2 % normal mothers
 182 had good condition of placental weight. The score of the minimum was 15 and the maximum
 183 was 21, with the mean score of 17.80 while the standard deviation was 1.540 in normal
 184 mothers. While in anemic mothers it was found that 30 percent had average condition of
 185 placental weight. The minimum score found was 11 and the maximum score found was 20,
 186 the mean score was 16.23 while the standard deviation was 2.661 in anemic mothers.

187 In assessment of fetal weight shows that the seventy three point three percent (73.3%) normal
 188 mothers had average condition of fetal outcome while 26.7% normal mothers had good
 189 condition of fetal outcome. The minimum was 06 and the maximum was 13, with the mean
 190 score of 9.53 while the standard deviation was 1.525 in normal mothers. While in anemic
 191 mothers it was found that 93.3% percent had average condition of fetal outcome, while,
 192 06.7% had good condition of fetal outcome. Thescore of the minimum was 06 and the
 193 maximum was 11, with the mean score of 8.47 while the standard deviation was 1.279 in
 194 anemic mothers.

195 Incomparision, the mean score of normal mothers is 17.80 while the anemic mothers is 16.23
 196 and the standard deviation for normal mothers is 1.540 and anemicmothers is 2.661. the

197 degree of freedom found was 29 and the p value found is .006 which is less than the p value
198 0.05 which is significant and also, table no. 3.2 states the comparison of the fetal outcome in
199 normal and anemic mothers, that the mean score of normal mothers is 9.53 while the anemic
200 mothers is 8.47 and the standard deviation for normal mothers is 1.525 and anemic mothers is
201 1.279. the degree of freedom found was 29 and the p value found is .014 which is less than
202 the p value 0.05 which is significant hence the alternative hypothesis (H1) is accepted that,
203 there may be a significant difference in placental weight and fetal outcome in normal mothers
204 and anaemic mothers.

205 Similar study was conducted to determine the effect of maternal anemia on placenta and
206 newborn. The sample of total 69 anemic mothers (<110g/L) and 16 mother without anemia
207 (>_110g/L) were studied fetal birth weight, placental morphometry. The result shows that the
208 birth weight, placental weight and number of cotyledons were significantly severely reduced
209 in severe anemic mother (Hb \leq 60 g/l) and had direct relationship with maternal hemoglobin
210 level However, placental volume and surface area showed no constant relation to maternal
211 hemoglobin. The hemoglobin and iron levels in the cord blood and placental tissue were
212 found to have linear correlations with the maternal hemoglobin levels. The low levels of
213 placental and cord serum iron in the severely anemic mothers suggest that iron supply to the
214 placenta and the fetus is affected in maternal anemia and the fetus takes iron in direct
215 proportion to the levels available in the mother. This study concluded that maternal anemia
216 affects placenta and newborn.⁹

217 A similar study was conducted on assessment of Placental Weight, Newborn Birth Weight in
218 Normal Pregnant Women and Anemic Pregnant Women: A Correlation and Comparative
219 Study. The study shows that The mean placental weight in 30 normal pregnant women was
220 521.00gms, Mean Placental weight in anemic pregnant women was 553.00gms. There is
221 statistically no difference in placental weight in both groups. The mean birth weight in 30
222 normal pregnant women was 3152gms, Mean Placental weight in mild, moderate, severe
223 anemic pregnant women was 3100 gms, 2800 gms, 2930gms. There was positive correlation
224 between placental weight and baby's weight at p value 0.05 level of significance.¹⁰

225 A similar study was conducted on a Comparative Study to Assess the Fetal and Placental
226 Outcome among Anaemic and Non-Anaemic Mothers of Selected Hospital of District
227 Mohali, Punjab, India. The study shows that out of 100 mothers majority of the anaemic
228 mothers 74% were in the age group of 21-30 years and in non-anaemic 86% were in age

229 group of 21-30 years, 66% anaemic mothers were from joint family and 52% nuclear family
230 and in non-anaemic 71% were from nuclear family, most of the anaemic mothers 48% of
231 mothers had 5001-10000 family income and in non-anaemic mothers 66% had 5001-10000,
232 maximum 44% anaemic mothers had Sikh religion and in non-anaemic 58% also from Sikh
233 religion, 46% of anaemic mothers had primary and 32% of non-anaemic mothers had
234 secondary education, 78% of anaemic mothers and 66% of non-anaemic mothers were home
235 maker, 54% of anaemic mothers were vegetarian and 66% of non-anaemic mothers were non-
236 vegetarian, 58% of anaemic mothers were from rural and 60% of non-anaemic mothers were
237 from urban area. Fetal outcome the 28.0% anaemic and 72.0% non-anaemic mothers had
238 good fetal outcome and 68.0% anaemic and 32.0% non-anaemic mothers had poor fetal
239 outcome. Placental outcome the 18.0% anaemic and 82.0% non-anaemic mothers had good
240 placental outcome and 46.0% anaemic and 54.0% non-anaemic mothers had poor placental
241 outcome. χ^2 value showed that there was statistically no significant association with
242 demographic variables of anaemic and non-anaemic mothers.¹¹

243 The present study revealed that proper health education should be given to mothers to
244 improve their knowledge regarding proper nutritional care which will prevent from anaemia.

245 **CONCLUSION**

246 The study concludes with the following result that placental weight shows there is ninety three
247 percent (93%) normal mothers had average condition of placental weight while 2 % normal
248 mothers had good condition of placental weight. While in anemic mothers it was found that
249 30 percent had average condition of placental weight. The fetal weight shows that the seventy
250 three point three percent (73.3%) normal mothers had average condition of fetal outcome
251 while 26.7% normal mothers had good condition of fetal outcome. While in anemic mothers it
252 was found that 93.3% percent had average condition of fetal outcome, while, 06.7% had good
253 condition of fetal outcome. The study concludes that there is lack generalization number of
254 sample. Therefore, study with more samples might be useful to find out the findings. Proper
255 health education should be given to mothers to improve their knowledge regarding proper
256 nutritional care which will prevent from anaemia.

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UNDER PEER REVIEW