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Nutritional Status of Pregnant Mother (Women)

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ABSTRACT

Maternal nutrition plays a critical role in ensuring optimal health outcomes for both mother and fetus. This study investigates the relationship between the nutritional status of pregnant women and associated maternal and fetal health outcomes. Using a cohort of 400 pregnant women from diverse backgrounds, we assessed dietary intake, micronutrient levels, body mass index (BMI), and gestational weight gain. Our findings indicate a significant association between maternal malnutrition, including both undernutrition and overnutrition, and adverse outcomes such as gestational hypertension, preeclampsia, low birth weight, and preterm delivery. Addressing nutritional needs during pregnancy is essential to reduce maternal morbidity and improve neonatal outcomes.

Keywords: *Maternal nutrition, pregnancy, fetal health, malnutrition*

INTRODUCTION

Pregnancy is the period of dynamic change for a mother requiring a lot of care because fetus is nourished directly by the mother through placenta, and baby totally relies upon its mother for nutrition, the pregnant woman is to be delivered with an adequate and well-balanced diet, to ensure that she attains an satisfactory weight. Correct dietary balance is necessary to ensure sufficient energy intake for adequate growth of fetus without drawing on mother's own tissues to maintain her pregnancy. In pregnancy, good nutrition is crucial to ensure upright maternal health and lessen the risk of birth defects, suboptimal fetal growth and development as well as chronic health problems in their children. Monitoring gestational nutritional status by taking anthropometric measurements is a promising means of enhancing fetal growth. It is found that nutritional intervention focused on woman's health during the reproductive stage, not only in the preconception period but also during the prenatal period, helps achieve adequate newborn nutritional status and is reflected in childhood health and nutritional conditions. However, babies born less than 2500 g are considered low in birth weight. Most low birth weight in developing countries is due to intrauterine growth retardation which is caused predominately by maternal malnutrition, either before conception or during pregnancy. The effects of malnutrition during childhood or adolescence and during pregnancy probably have an additive negative influence on birth weight. Birth weight is crucial to the survival of the infant. It has been found that normal infants in industrial countries have a mortality rate of 2/1,000 while low birth weight infants have a mortality rate of 86/1,000.

Well balanced diet has an important role in health throughout the lifecycle and affects the functioning of all body systems. Increased nutritional and energy needs in pregnancy are due to the physiologic changes of mother and metabolic demands of fetus. These are met through numerous physiologic adaptations including changes in nutrient metabolism orchestrated by placental hormones. Still, if the nutritional and energy needs are not met (especially under severe deprivation), evidence indicates that this will result in unfavorable changes of infant weight, size and body composition, and even in an apparently healthy infant, in alteration of metabolic competence that might emerge as a disease in later life. Healthy diet in pregnancy should ensure proper fetal growth, good maternal health and lactation. Good fetal supply is also achieved through increased intestinal absorption or reduced excretion via the kidney or gastrointestinal tract. Nutritional counselling and interventions need to be an integral part of antenatal and pregnancy care.

If low birth weight babies survive, they have greater rates of morbidity and poorer neurological development (poor vision, decreased educational attainment, and more cerebral palsy, deafness and autism). Impairment to the nervous system upsurges as birth weight falls. Babies with weights greater than 3.5 kg have 6.8 cases of neurological problems per 1,000 live births compared to babies with weights less than 1.5 kg who have 200 cases of neurological problems per 1,000 live births. For weight, an indicator used to measure protein-energy status, women in both developing and industrial countries who are heavier before pregnancy deliver heavier babies. Pre-pregnancy weight can thus be used to predict low birth weight. In a US study, women with a pre-pregnancy weight below 130 lbs or 59 kg were more than twice as likely to have low birth weight infants when compared to women with pregnancy weights >130 lbs or 59 kg.

Exclusive breastfeeding were practiced in Bangladesh about 36% and percentage of malnutrition in children (birth to 59 months) including wasting, stunting, underweight and low birth weight were found 17.4, 43.2, 41 and 36 respectfully. In Bangladesh, Females giving birth by age 20 was found 63% and children who are exclusively breastfed at ages less than 6 months was found 45%. It was found that the rest of the populations did not follow the proper guidelines of pregnancy and lactation period. Micronutrient deficiencies especially iron and folic acid deficiencies that result in nutritional anemia in children and women and neural tube defects in newborns remain a public health problem in Bangladesh. Poor intake of foods rich in iron and folic acid and multiple infections have resulted in high rates of anemia among pregnant women.

Coverage of pre and postnatal iron and folic acid supplements is very low (only 15% of pregnant women in rural areas take at least 100 tablets during pregnancy) due, in part, to low compliance rates and low coverage of antenatal services. Coverage of multiple micronutrient supplements formulated to address iron and other micronutrient deficiencies is also very low. The aim of this study was to elucidate the authentic and real situation of the nutritional status of pregnant women and their new born baby in case of hospitalized facilities in Bangladesh. It would be supportive for peoples as well as the authority to know the present situation of pregnancy at hospitalized care system in Bangladesh and also useful for policy makers to reform their hospitals.

OBJECTIVE OF THE STUDY

The objectives of the study are as follows:

1. To identify the real scenario of pregnant women nutritional status in Bangladesh.
2. To identify the challenges and find out necessary solution about pregnant women nutritional status in Bangladesh.
3. To find out necessary developments of pregnant women nutritional status in Bangladesh.

METHODOLOGY OF THE STUDY

Study design: The design of the study was cross sectional study.

Study Area: The study was conducted in Department of Obstetrics and Gynecology at Dhaka Medical College Hospital in Bangladesh.

Study Period: The study was conducted from July 2018 to June 2020.

Sampling Method: Random sampling method was used for the study.

Sample Size: Total 400 respondents were selected for the study. Data were collected from the patients.

Sources of Data: Data were collected from primary and secondary sources.

Sources of Primary Data: Primary Data were collected from the respondents of the study area.

Sources of Secondary Data: Secondary Data were collected from Books, Research Report, Journal, Thesis, Internet etc.

Tools for Data Collection: Questionnaire was used for data collection.

Method of Data Collection: Data were collected by face to face interview with the respondents.

Inclusion Criteria: Pregnant Patients admitted in Gynaecology words and patients who came Gynaecology OPD at Dhaka Medical College Hospital.

Exclusion Criteria: Other patients except Pregnant. Other gynaecological complexities except nutritional problems.

Data Processing and Analysis: In qualitative study the researcher has the freedom to marshal gathered data to meet the desired objectives of the study (Creswell 2009). Partial data of questionnaire survey were processed using simple statistics. The rest of the data were explained carefully to meet the aim of the study and research question and also attempted to establish relation among the variables. Some important and strong statements were referred in the analysis part to add value to the findings. Computer Program Statistical Packages for the Social Sciences were used for data analysis. Data were analyzed according to the objectives of the study. Tables, graphs and statistical analysis were done by Computer Program Statistical Package for the Social Sciences.

RESULTS AND DISCUSSION

Table 1: Age and monthly family income standard deviation or SD is given in bracket

Low income group					High income group				
Sub groups	N	%	Age (years)	*MFI (USD)	Sub groups	N	%	Age (years)	*MFI (USD)
L1	36	35.6	28(5)	19(4)	H1	30	33.3	29(6)	373(230)
L2	30	29.7	23(5)	31(18)	H2	30	33.3	27(4)	374(328)
L3	35	34.6	23(4)	16(4)	H3	30	33.3	26(5)	393(250)

Source: Field survey, 2020

The mean monthly income of the families was USD 22 and 358 for respondents in groups L and H, respectively. The mean age and monthly family income of the respondents in subgroups of these two groups are presented in Table 1. Of the respondents 21% were between 16−20 years, 65% were 21−30 years and the remaining 14% were 31−40 years old. The mean parity of the respondents in low and high socio-economic groups was 3.0 and 1.7, respectively.

Table 2: Distribution of pregnant women by family size and income

Variable		Pregnant women	% of pregnant women
Level of family size (number of person)	<3 person	27	6.75
	3-4 person	171	42.75
	>4 person	202	50.50
Range of family income (Taka)	<5000 Taka	240	60.00
	5000-8000 Taka	80	20.00
	8000-10000 Taka	53	13.25
	>10000Taka	27	6.75

Source: Field survey, 2020

From the result it was found that 6.75% of pregnant women has family size <3, 42.75% pregnant were family size 3-4, 50.50%were family size >4. The majority family size were>4 and 60 % of pregnant women were family income <5000 TK., 20% pregnant women were family income 5000-8000 TK. and 13.25% were family income 8000-10000 TK. while only six percent were family income >10000. The majority of pregnant women were family income less than 5000 as presented in Table 2.

Table 3: Educational qualification of the Respondents

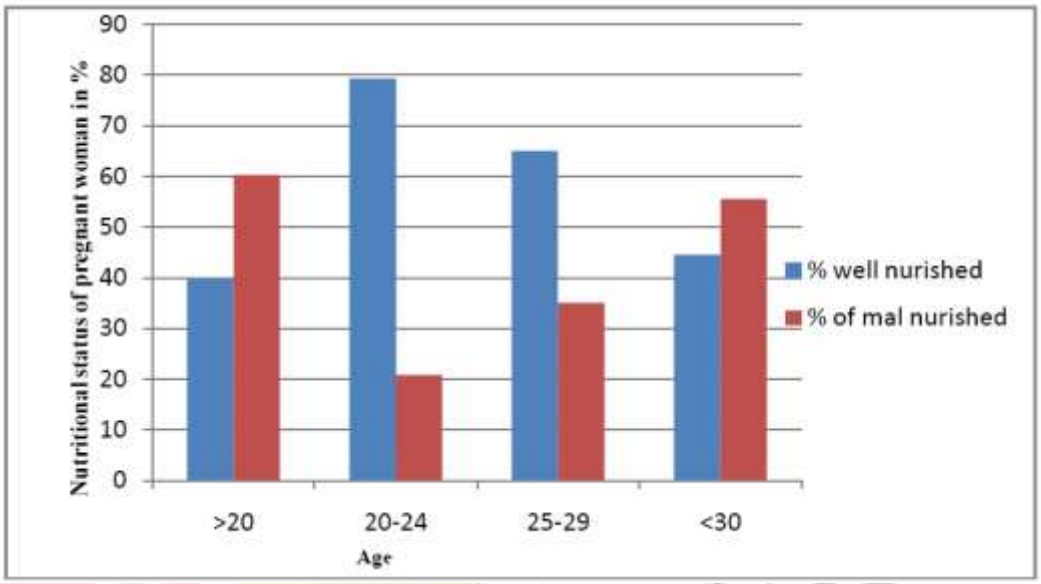
Level of education	Group L	Group H	% of the total subjects
Illiterate	90	-	47
Can read and write	3	-	1.6
Attended primary school	4	2	3.1
Attended class VI-X	2	12	7.3
*SSC to **HSC	2	41	22.5
Graduation and above	-	35	18.3

Source: Field survey, 2020

*Secondary School Certificate
**Higher Secondary Certificate

Nearly 90% of the respondents were housewives who were engaged in household activities only. About 90% of the respondents in group L were illiterate, whereas all the individuals in group H were literate. Five levels of education were distinguishable (Table 3).

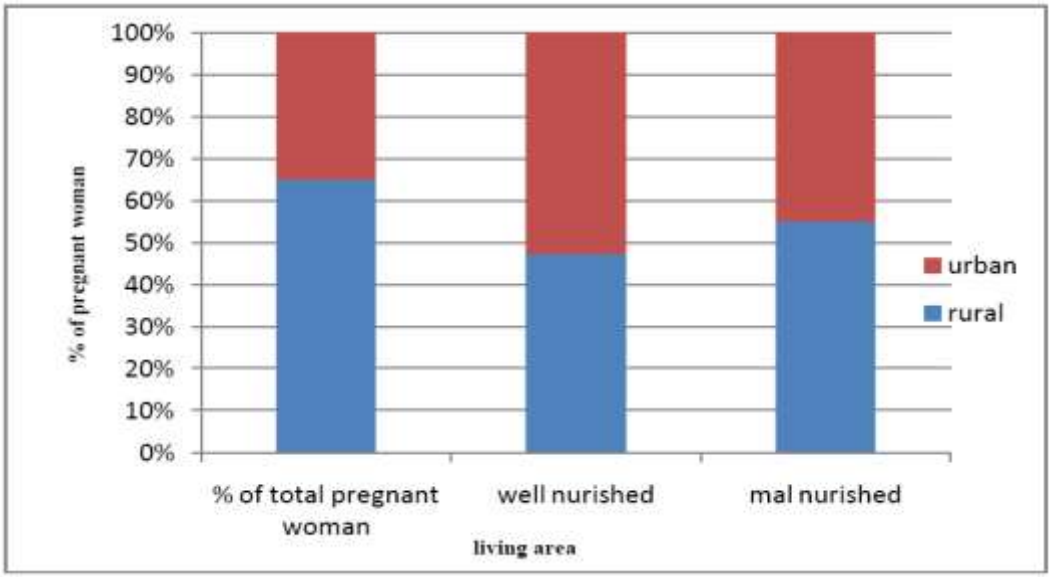
Figure 1: Distribution of age of pregnant women by their nutritional status



Source: Field survey, 2020

About 39.75 % pregnant women below 20 years of age were well nourished and rest of mal nourished, 79.25% of age 20-24 years were well nourished and rest of mal nourished, 25-29 years age group were 65.00% well nourished and rest of mal nourished ,above 30 years age group were 44.50% well nourished and 55.50% mal nourished (Figure 1).

Figure 2: Distribution of pregnant women by living area and nutritional status.



Source: Field survey, 2020

However a very good result has been come out about the distribution of pregnant women based on living area 65% pregnant women are living in rural area where as 35% are living in urban area, data are presented in figure 2. Among the pregnant women in rural area 61.54% are well nourished and 38.46% are mal nourished. On the hand pregnant women in urban area about 68.57% are well nourished and 31.43% are mal nourished, data are presented in figure 2. Therefore very small percentages (7%) of pregnant women are suitably living in urban area.

Table 4: Food intake (per capita per day) of pregnant women

Food groups (gm)	Food intake (Mean± Standard Deviation)
Cereal	342.0±74.0
Root and tubers	451.0±36.0
Pulse and Nut	12.0±4.5
Vegetables	89.9±260
Fruits	15.0±5.0
Meats	9.0±4.0
Fish	28.0±8.0
Milk and milk product	12.0±4.0
Fats and Oils	6.2±2.3

Source: Field survey, 2020

Per capita food intake of the studied population and comparison with the national intake (95 – 96) is presented in Table 4. Cereal intake was found to be lesser, intake of protein containing foods like pulse & nuts, meat, egg, fish, milk & milk products were very much close to the national intake.

Table 5: Pattern of intake of selected food items by pregnant women

Food item	Frequency of intake/week				
	0%	1-2%	3-4%	5-6%	≥7%
Meat	9.4	28.2	39.3	11.4	19.7
Fish	12.7	24.1	31.7	17.8	18.7
Eggs	17.0	30.2	30.2	16.4	11.2
Milk	47.1	24.1	13.3	14.3	7.2
Liver	65.6	28.8	5.6	2.5	2.5
Leafy vegetables	27.7	44.6	15.4	4.6	7.7
Other vegetables	10.2	19.6	24.1	19.5	31.6
Fruits		8.5	17.4	12.9	68.2

Source: Field survey, 2020

Results are expressed as the percentage (%) of the participants consuming different frequencies of each food items in the week preceding the interview. A large proportion of the participants consumed meat (62.5%), fish (53.8%) and eggs (58.4%) 3 to 4 times or less in the week preceding the interview (Table-5). A substantial proportion of the girls did not take milk (46.1%) and liver (64.6%) at all in the week. About 27.7% did not take leafy vegetables; while substantial proportions of the participants had other vegetables (72.2%) 3 to 4 times or more in the week. Fruits were highly popular among the girls, being consumed at least 3 times in the week by an overwhelming majority of the participants (93.5%). Most of the fruits consumed were mango, jackfruit, pineapple, banana, lemon and guava.

Table 6: Body Mass Index (BMI) values and distribution of respondents (%) in the investigated subgroups of the two socio-economic groups mean value is given in parentheses

	Subgroups of the group L			Subgroups of the group H		
BMI	L1 (17.1)	L2 (19.4)	L3(17.1)	H1 (22.9)	H2 (23.0)	H3(21.8)
<16	25.0	-	25.7	3.3	-	3.3
16-17	22.2	10.0	31.4	-	-	3.3
17-18.5	44.4	26.6	22.8	6.6	6.6	6.6
18.5-25	8.3	60.0	20.0	66.6	70.0	73.4
>25	-	3.3	-	23.4	23.4	13.4

Source: Field survey, 2020

From the result it was found that about 77% of pregnant respondents in the low income group and 13% in the high income group were classified as underweight.11 In the pregnant respondents of the low income group, BMI values showed a higher prevalence of underweight even when pregnancy was ignored and normal classification of BMI was applied. Using these criteria, 36% of respondents in this subgroup had a BMI <18.5kg/m^2. More than 66% of respondents in subgroup H2 were within the normal range of BMI for pregnant women, and 20% had a BMI higher than 26 kg/m^2. In subgroup L3, about 80% of the respondents were underweight. The BMI values and distribution of respondents in different subgroups are presented in Table 6.

CONCLUSION

In conclusion, it can be said that the higher prevalence of short stature in Respondents of the low socio-economic group indicates nutritional deficiencies in the past. Nutritional problems were predominantly present in women of the low income group, and the high prevalence of both low BMI and low energy intake emphasize the vulnerability of this group to malnutrition. The study defined several differences in the nutritional states of the two main groups which have a potential influence on the well-being of the respondents as well as their offspring. Intervention programmes of the Public Health Department in developing countries should target these women at risk and attempt to eliminate these differences for the sake of future generations.

RECOMMENDATION

The recommendations of the study are as follows:

1. Folic acid should be eaten during pregnant

Also known as folate when the nutrient is found in foods, folic acid is a B vitamin that is crucial in helping to prevent birth defects in the baby's brain and spinal cord, known as neural tube defects. It may be hard to get the recommended amount of folic acid from diet alone. For that reason the March of Dimes, an organization dedicated to preventing birth defects, recommends that women who are trying to have a baby take a daily vitamin supplement containing 400 micrograms of folic acid per day for at least one month before becoming pregnant. During pregnancy, they advise women to increase the amount of folic acid to 600 micrograms a day, an amount commonly found in a daily prenatal vitamin.

Food sources: leafy green vegetables fortified or enriched cereals, breads and pastas, beans, citrus fruits.

2. Calcium should be eaten during pregnant

This mineral is used to build a baby's bones and teeth. If a pregnant woman does not consume enough calcium, the mineral will be drawn from the mother's stores in her bones and given to the baby to meet the extra demands of pregnancy, according to the Academy of Nutrition and Dietetics. Many dairy products are also fortified with vitamin D, another nutrient that works with calcium to develop a baby's bones and teeth. Pregnant women age 19 and over need 1,000 milligrams of calcium a day; pregnant teens, ages 14 to 18, need 1,300 milligrams daily, according to ACOG.

Foods such as milk, yogurt, cheese, calcium-fortified juices and foods, sardines or salmon with bones, some leafy greens (kale, bok choy) should be eaten regularly

3. Iron should be eaten during pregnant

Pregnant women need 27 milligrams of iron a day, which is double the amount needed by women who are not expecting, according to ACOG. Additional amounts of the mineral are needed to make more blood to supply the baby with oxygen. Getting too little iron during pregnancy can lead to anemia, a condition resulting in fatigue and an increased risk of infections. To increase the absorption of iron, include a good source of vitamin C at the same meal when eating iron-rich foods, ACOG recommends. For example, have a glass of orange juice at breakfast with an iron-fortified cereal.

Foods such as meat, poultry, fish, dried beans and peas, iron-fortified cereal should be eaten regularly.

4. Protein should be eaten during pregnancy

More protein is needed during pregnancy, but most women don't have problems getting enough protein-rich foods in their diets, said Sarah Krieger, a registered dietitian and spokeswoman on prenatal nutrition for the Academy of Nutrition and Dietetics in St. Petersburg, Florida. She described protein as "a builder nutrient," because it helps to build important organs for the baby, such as the brain and heart.

Foods such as meat, poultry, fish, dried beans and peas, eggs, nuts, tofu should be eaten regularly.

5. Good Foods should be eaten during pregnancy

During pregnancy, the goal is to be eating nutritious foods most of the time, Krieger told Live Science. To maximize prenatal nutrition, she suggests emphasizing the following five food groups: fruits, vegetables, lean protein, whole grains and dairy products.

When counseling pregnant women, Krieger recommends they fill half their plates with fruits and vegetables, a quarter of it with whole grains and a quarter of it with a source of lean protein, and to also have a dairy product at every meal.

6. Fruits and vegetables should be eaten during pregnancy

Pregnant women should focus on fruits and vegetables, particularly during the second and third trimesters, Krieger said. Get between five and 10 tennis ball-size servings of produce every day, she said. These colorful foods are low in calories and filled with fiber, vitamins and minerals.

7. Lean protein should be eaten during pregnancy

Pregnant women should include good protein sources at every meal to support the baby's growth, Krieger said. Protein-rich foods include meat, poultry, fish, eggs, beans, tofu, cheese, milk, nuts and seeds.

8. Whole grains should be eaten during pregnancy

These foods are an important source of energy in the diet, and they also provide fiber, iron and B-vitamins. At least half of a pregnant woman's carbohydrate choices each day should come from whole grains, such as oatmeal, whole-wheat pasta or breads and brown rice, Krieger said.

9. Dairy foods should be eaten during pregnancy

Aim for 3 to 4 servings of dairy foods a day, Krieger suggested. Dairy foods, such as milk, yogurt and cheese are good dietary sources of calcium, protein and vitamin D.

In addition to a healthy diet, pregnant women also need to take a daily prenatal vitamin to obtain some of the nutrients that are hard to get from foods alone, such as folic acid and iron, according to ACOG.

For women who take chewable prenatal vitamins, Krieger advised checking the product labels, because chewables might not have sufficient iron levels in them. Detailed information on healthy food choices and quantities to include at meals can also be found in the pregnancy section of the USDA's choosemyplate.gov.

10. Fish should be eaten during pregnancy

Fish is a good source of lean protein, and some fish, including salmon and sardines, also contain omega-3 fatty acids, a healthy fat that's good for the heart. It is safe for pregnant women to eat 8 to 12 ounces of cooked fish and seafood a week, according to ACOG. However, they should limit albacore or "white" tuna, which has high levels of mercury, to no more than 6 ounces a week, according to ACOG. Mercury is a metal that can be harmful to a baby's developing brain. Canned light tuna has less mercury than albacore "white" tuna and is safer to eat during pregnancy.

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11. Caffeine should not be eaten during pregnancy

Consuming fewer than 200 mg of caffeine a day, which is the amount found in one 12-ounce cup of coffee, is generally considered safe during pregnancy, according to a 2010 ACOG committee opinion, which was reaffirmed in 2013. The committee report said moderate caffeine consumption during pregnancy does not appear to contribute to miscarriage or premature birth.

12. Alcohol should not be eaten during pregnancy

Avoid alcohol during pregnancy, Krieger advised. Alcohol in the mother's blood can pass directly to the baby through the umbilical cord. Heavy use of alcohol during pregnancy has been linked with fetal alcohol spectrum disorders, a group of conditions that can include physical problems, as well as learning and behavioral difficulties in babies and children, according to the Centers for Disease Control and Prevention (CDC).

13. Fish with high levels of mercury should not be eaten during pregnancy

Seafood such as swordfish, shark, king mackerel, marlin, orange roughly and tilefish are high in levels of methyl mercury, according to the Academy of Nutrition and Dietetics, and should be avoided during pregnancy. Methyl mercury is a toxic chemical that can pass through the placenta and can be harmful to an unborn baby's developing brain, kidneys and nervous system.

Unpasteurized food should not be eaten during pregnancy

According to the USDA, pregnant women are at high risk for getting sick from two different types of food poisoning: listeriosis, caused by the Listeria bacteria, and toxoplasmosis, an infection caused by a parasite.

The CDC says that Listeria infection may cause miscarriage, stillbirth, preterm labor, and illness or death in newborns. To avoid listeriosis, the USDA recommends avoiding the following foods during pregnancy:

- Unpasteurized (raw) milk and foods made from it, such as feta, Brie, Camembert, blue-veined cheeses, queso blanco and queso fresco. Pasteurization involves heating a product to a high temperature to kill harmful bacteria.
- Unpasteurized refrigerated meat spreads or pates.

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