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A Comparative Study of Nutrition Status of Working and Non-Working Pregnant Women in Sri Ganga Nagar District of Rajasthan

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Abstract

The main purpose of the present study was to compare the Nutritional status of Working and Non-Working Pregnant women in the Sri Ganga Nagar district of Rajasthan. The sample selections of 200 from working and 200 from a non-working total of 400 pregnant women have been selected for the Purposive Sampling Method. Parameters used for the study were a survey and predesigned structured questionnaire for the assessment of nutritional status, anthropometric measurements for Height, weight, and BMI, assessment of dietary intake, Biochemical assessment for hemoglobin. Data were analyzed using SPSS software and were tabulated statistically using percent, t-test, z-test was applied. The results conclude that the Quantities of all food groups consumed by working and non-working pregnant women were significantly (P<0.01) lower than the recommended levels. Quantities of all nutrients consumed by working and non-working pregnant women were significantly (P<0.01) lower than the recommended levels. There is a significant difference in the means of height and weight in the working and non-working pregnant women. The majority (68.5%) and (46.5%) of both the working and non-working pregnant women were in the category of normal BMI, respectively. There is a significant difference in the means of hemoglobin in working and non-working pregnant women.

Keywords: ***Nutrition Status, Working, and Non-Working, Pregnant Women.***

Introduction

Pregnancy is the period in the life of an adult woman for about nine months when the fetus i.e. the unborn baby grows inside her body. To support the growth of the fetus, certain physiological changes take all the nutrients required for its growth from the mother's baby by the placenta. Hence, pregnancy is a period of morphological, anatomical and physiological changes that is accompanied by high nutritional demands. Pregnancy is a period of morphological, anatomical and physiological changes that is accompanied by high nutritional demands. The nutritional status of the mother during pregnancy is believed to influence not only the course of pregnancy but also the nutritional status of the new born.

Nutritional status is the condition of health of the individual as influenced by utilization of the nutrients. It is determined through correlated responses obtained by a careful medical and dietary history and physical examination.

Methodology

Objectives of the Study

- To find out the background status of working and non-working pregnant women.
- To access and compare the dietary pattern by means of food and nutrients intake, percent adequacy of nutrientsof working and non-working pregnant women.
- To study the nutritional status of working and non- working pregnant women.

Sample Selection Method

The present study consisted of 400 pregnant women in all. Out of 400 samples, 200 were working pregnant and 200 were non-working pregnant women in Sri Ganga Nagar District of Rajasthan were selected by purposively sampling method.

Data Collection Method

Data Collection parameters used for the study were survey and predesigned structured questionnaire for assessment of nutritional status, anthropometric measurements for Height, weight and BMI, assessment of dietary intake, food consumption pattern and nutrient intake calculated from three day dietary record during pregnancy, Biochemical assessment for hemoglobin.

Statistical Analysis

Data was analyzed using SPSS software and was tabulated statistically using percent, t-test, z-test was applied.

Result and Discussion

The collected data was analyzed with descriptive and inferential statistical techniques.

Table-1: Background information of Working and Non - Working Pregnant Woman

Sr. No.	Particular	Working Pregnant Women		Non-Working Pregnant Women	
		N=200	100%	N=200	100%
01.	**Age Group**	**F**	**%**	**F**	**%**
	18-22	8	4	24	12
	22-26	32	16	96	48
	26-30	86	43	52	26
	30 and above	74	37	28	14
02.	**Education**				
	Primary	-	-	16	8
	High School	6	3	20	10
	Intermediate	24	12	58	29
	Graduate	26	13	64	32
	Post Graduate	44	22	32	16
	Higher Professional Degree	100	50	10	5
03.	**Type of Family**				
	Nuclear	117	58.5	73	36.5
	Joint	83	41.5	127	63.5
04.	**Monthly Family Income (Rs.)**				
	12,000 – 16,000 Rs.	32	16	24	12
	16,000 – 20,000 Rs.	70	35	116	58
	20,000 – 25,000 Rs.	98	49	60	30
05.	**Food Habits**				
	Vegetarian	120	60	130	65
	Non-vegetarian	80	40	70	35

From the above table, findings reveal that majority of the working pregnant women (43%) were between 26-30 years ofage where as majority of non-working pregnant women (48%)were between 22-26 years of age. In case of working class, pregnancy was high in the age group of 26-30 years. Career making was the main reason that delayed the onset of pregnancy. On the basis of educational classification, majority of the working pregnant women (50%) were having Higher Professional Degree and remaining

pregnant women were educated up to High School (3%), Intermediate (12%), Graduate (13%) and Post graduate (22%). On the contrary, in non-working pregnant women, majority (32%) of the women was educated up to Graduate and remaining pregnant women were educated up to Primary (8%), High School (10%), Intermediate (29%), Post Graduate (16%) and Higher Professional Degree (5%). Distribution of the pregnant women on the basis of type of family, majority (58.5%) of the working pregnant women were belongs to nuclear family where as on the contrary, a high percentage that is (63.5%) of non-working pregnant women belong to joint family. It clearly shows that joint family system is now disintegrating among working pregnant women which may be due to education, employment and higher cost of living where as joint family system is more prevalent among non-working pregnant women. On the basis of monthly family income, majority (49%) of the working pregnant women were earning between Rs. 20,000-25,000 while majority (58%) of the non- working pregnant women were earning between Rs. 16,000- 20,000. According to food habits, perusal of the data reveal that (60%) of working and (65%) of non-working pregnant women were vegetarians while (40%) and (35%) were non- vegetarians respectively.

Table-2: Mean Food Intake of Working and Non-Working Pregnant Woman as compared to RDA

Sr. No.	Food Groups	RDA (gm)	Working Pregnant Women		Non-Working Pregnant Women		'z' Value
			Intake (N=200)	't' Value	Intake(N=200)	't' Value	
01.	Cereals (gm)	400	332.1 ± 46.0	20.8	327.5 ± 42.1	24.3	1.043^{NS}
02.	Pulses (gm)	70	45.9 ± 13.4	25.3	42.8 ± 14.2	26.8	2.245
03.	Green Leafy Vegetables (g)	150	112.1 ± 6.4	23.4	101.1 ± 3.7	26.2	8.210
04.	Roots and Tubers (gm)	75	50.9 ± 12.1	27.8	60.2 ± 10.2	20.3	6.26
05.	Other Vegetables (g)	75	55.4 ± 12.4	22.3	49.5 ± 14.5	24.7	4.37
06.	Fruits (gm)	30	19.4 ± 6.4	23.1	17.5 ± 6.7	26.0	2.90
07.	Milk and Milk Products (ml)	325	197.1 ± 71.1	25.3	229.1 ± 65.2	26.6	4.72
08.	Fats and oils	35	20.0 ± 6.2	34.0	22.4 ± 7.0	25.2	3.62
09.	Sugar and Jaggery (gm)	40	24.1 ± 8.6	25.9	24.8 ± 9.1	23.3	0.79^{NS}

't' value indicate comparison of food intake with RDA; Significant at 0.01.
'z' value indicate comparison of food intake of working and non-working pregnant women; Significant at 0.05 and NS is Not Significant.

From the above table, means intake of cereals by working and non-working pregnant women varied from (332.1± 46.0g) and (327.5±42.lg), respectively. Quantity of cereals consumed by working and non-working pregnant women was significantly (P<0.01) lower than the recommended levels and Working pregnant women consumed more cereals than the non- working pregnant women. The calculated value of 'z' (1.043) was not significant at the 0.05 level. Mean intake of pulses consumed by working pregnant women was (45.9±13.4g) and non-working pregnant women were (42.8±14.2g). Quantity of pulses consumed by both the type of pregnant women was significantly (P<0.0l) lower than that of recommended level. Working pregnant women had significantly more amount of pulses in their diet than the non-working pregnant women. The observed value of 'z' (2.245) was significant at the 0.05 level. Hence, intake of pulses by working and non-working pregnant women shows significant difference. Mean intake of green leafy vegetables consumed by working and non- working pregnant women was (112.1±6.4g) and (101.1±3.7g) respectively. Quantities of green leafy vegetables consumed by both the type of pregnant women were significantly (P<0.01) lower than the recommended levels. Working pregnant women had significantly (P<0.01) more green leafy vegetables in their diets than non-working pregnant women. The calculated value of 'z' (8.210) shows a significant difference at the 0.05 level. This concluded that there is a difference in the means of intake of green leafy vegetables in both the type of pregnant women. Mean intake of roots and tubers by working pregnant women from (50.9±12.1g) and non-working women from (60.2±10.2g). Intake of roots and tubers by working and non-working pregnant women was significantly lower (P<0.01) than the recommended levels. Working pregnant women had significantly lower amount of roots and tubers in their diet than the non-working pregnant women. The calculated value of 'z' (6.26) was significant at the 0.05 level. Mean intake of other vegetables by workingand non-working pregnant women was (55.4±12.4g) and (49.5±14.5g), respectively. Quantities of other vegetables consumed by working and non-working pregnant women were significantly (P<0.01)

lower than the RDA. There was a significant difference in the intake of other vegetables in both the type of pregnant women. The calculated value 'z' (4.37) was significant at the 0.05 level. This concluded a significant difference in means of intake of other vegetables in both the type of pregnant women. Mean intake of fruits by working pregnant women was (19.4±6.4g) and (17.5±6.7g) by non- working pregnant women. The consumption of fruits by both the type of pregnant women were significantly ($P<0.01$) lower than the RDA levels. Working pregnant women had more fruits in their diet than the non-working pregnant women. The observed value of 'z' (2.90) was significant at the 0.05 level. This shows a significant difference in the means of intake of fruits in both the type of pregnant women. Mean intake of milk and milk products by working and non- working pregnant women was (197.5±71.1g) and (229.7±65.2g) respectively. The consumption of milk and milk products by both the type of pregnant women was significantly ($P<0.01$) lower than the recommended levels. Non-working pregnant women had significantly more milk and milk products in their diet than the working pregnant women. The calculated value of 'z' (4.72) was significant at the 0.05 level. This shows a significant difference in the means of intake of milk and milk products in both the type of pregnant women. Mean intake of fats and oils by working pregnant women was (20.0±6.2g) and (22.4±7.0g) by non- working pregnant women. The consumption of fats and oils by both the type of pregnant women were significantly ($P<0.01$) lower than the RDA levels. Non-working pregnant women had more fats and oils in their diet than their working pregnant women. The observed value of 'z' (3.63) was significant at the 0.05 level. This shows a significant difference in the means of intake of fats and oils in both the type of pregnant women. Mean intake of sugar and jaggery consumed by working and non-working pregnant women was (24.1±8.6g) and (24.8±9.lg) respectively. Quantities of sugar and jaggery consumed by both the type of pregnant women were significantly ($P<0.01$) lower than the recommended levels. The observed value of 'z' (0.79) was non-significant. There was no significant difference in sugar and jaggery intake by both the type of pregnant women.

Table-3: Percent adequacy of Food Intake of Working Pregnant Women and Non - Working Pregnant Women

Sr. No.	Food Groups	Working Pregnant Women	Non-Working Pregnant Women
01.	Cereals (gm)	83.0	81.8
02.	Pulses (gm)	65.5	61.1
03.	Green Leafy Vegetables (gm)	74.7	67.4
04.	Roots and Tubers (gm)	67.8	80.2
05.	Other Vegetables (gm)	73.8	66.0
06.	Fruits (gm)	64.6	68.0
07.	Milk and Milk Products (ml)	60.7	70.6
08.	Fats and oils (gm)	57.1	64.0
09.	Sugar and Jaggery (gm)	60.2	62.0

From the above table, percent adequacy of food intake by working and non-working pregnant women Cereals intake was (83%) of working pregnant women and (81.8%) of non- working pregnant women. Pulses intake was only (65.5%) and (61.1%) of RDA by working and non-working pregnant women respectively. The intake of green leafy vegetables was (74.7%) and (67.4%) of RDA by working and non-working pregnant women respectively. Green leafy vegetables intake was (74.7%) of working pregnant women and (67.4%) non– working pregnant women. The intake of other vegetables was (73.8%) and (66%) of RDA by working and non-working pregnant women respectively. The intake of fruits was (64.6%) and (58.3%) of RDA by working and non-working pregnant women respectively. Milk and milk products intake was (60.7%) and (70.6%) of RDA by working and non- working pregnant women respectively. The intake of fats and oils was (57.1%) and (64%) of RDA by working and non-working pregnant women respectively. The intake of sugar and jiggery was (60.2%) and (62%) of RDA by working and non-working pregnant women respectively.

Table-4: Mean Nutrients Intake of Working Pregnant Women and Non-Working Pregnant Woman as compared to RDA

Sr. No.	Nutrients	RDA	Working Pregnant Women		Non-Working Pregnant Women		'z' Value
			Intake (N=200)	't' Value	Intake (N=200)	't' Value	
01.	Protein (gm)	65	44.6 ± 12.9	22.1	40.0 ± 13.0	27.0	3.55
02.	Energy (Kcal)	2500	1949.1 ± 384.1	20.2	1851.1 ± 359.3	19.5	1.81
03.	Calcium (mg)	1000	502.3 ± 165.5	42.5	659.2 ± 182.1	40.2	1.15
04.	Iron (mg)	38	25.3 ± 5.8	30.3	22.7 ± 6.7	32.0	4.15
05.	Carotene (µg)	2400	1945.2 ± 361.7	17.7	1765.5 ± 431.0	20.8	4.52
06.	Thiamine (mg)	1.3	1.01 ± 0.3	21.0	0.9 ± 0.2	23.8	4.21
07.	Riboflavin (mg)	1.5	0.83 ± 0.3	24.9	0.58 ± 0.3	32.8	6.58
08.	Niacin (mg)	16	10.5 ± 2.9	26.0	8.3 ± 3.8	28.1	6.51
09.	Vitamin C (mg)	40	23.4 ± 8.7	26.9	19.2 ± 8.1	36.1	5.00
10.	Folic Acid (µg)	300	217.5 ± 46.2	25.2	160.4 ± 49.8	39.5	5.64
11.	Vitamin D (I.U)	200	142.4 ± 29.7	27.3	133.3 ± 27.2	34.5	3.20

't' value indicate comparison of food intake with RDA; Significant at 0.01

'z' value indicate comparison of food intake of working and non-working pregnant women; Significant at 0.05 and NS is Not Significant.

From the above table, mean intake of protein by working and non-working pregnant women varied from (44.6±12.9g) and (40.0±13.0g) respectively. The intake of protein by both the type of pregnant women was significantly (P<0.01) lower than that of recommended level. The observed value of 'z' (3.55) was significant at 0.05 level which shows significant difference. Hence, working pregnant women were taking more protein as compared to non-working pregnant women. Mean intake of energy by working and non-working pregnant women was (1949.1±384.1g) and (1851.1±359.3g) respectively. The intake of energy by both the type of pregnant women was significantly (P<0.01) lower than that of recommended level. The observed value of 'z' (1.81) was significant at 0.05 level, thus data reveals that the energy intake by working pregnant women was high than the non- working pregnant women. Mean intake of calcium by working pregnant women was (502.3±165.5mg) and non- working pregnant was (659.2±182.1mg) against RDA value.

The comparison of calcium intake of working and non- working pregnant women shows that the diets of both the type of pregnant women was significantly (P<0.01) lower than that of recommended level. The calculated value of 'z' (1.15) was significant at 0.05 level thus shows there is a significant difference in the means of calcium intake of working and non-working pregnant women. Mean intake of iron by working and non-working pregnant women was (25.3±5.8mg) and (22.7 ± 6.7mg) respectively. Consumption of iron by both the type of pregnant women was significantly (P<0.0 1) lower than the recommended level. Working pregnant women had significantly (P<0.01) more iron intake than the non-working pregnant women. The value of 'z' (4.15) was significant at 0.05 level it shows a significant difference in the means of iron intake in both the type of pregnant women. Mean intake of carotene by working and non-working pregnant women was (1945.2±361.7µg) and (1765.5±431.0µg) respectively. Working pregnant women consumed significantly higher carotene as compared to non-working pregnant women but the intake was significantly (P<0.01) lower in both the type of pregnant women than RDA. Differences in means of carotene intake were found to be 'z' value (4.52) was significant at 0.05 level shows working pregnant women were taking more carotene as compared to non-working pregnant women. Mean intake of thiamine was (1.01±0.3mg) and (0.9±0.2mg) by working and non-working pregnant women respectively. Consumption of thiamine by both the type of pregnant women was significantly (P<0.0 1) lower than the recommended levels. 'z' value (4.21) significant at 0.05 level reveals that working pregnant women had higher intake of thiamine than non-working pregnant women. Riboflavin mean intake by working and non-working pregnant women was (0.83±0.3mg) and (0.58 ±0.3mg) respectively. Consumption of riboflavin by both the working and non-working pregnant women was significantly (P<0.01) lower than the RDA value. The observed value of 'z' (6.58) has given a significant at 0.05 level indicate that working pregnant women consumed higher riboflavin as compared to the non-working pregnant women. Mean intake of niacin by working and non-working pregnant women was (10.5±2.9mg) and (8.3± 3.8 mg) respectively. It was observed that mean intake of niacin by working and non-working pregnant respondents was significantly (P<0.01) lower than RDA but the intake of niacin by working pregnant women was comparatively higher than the non-working pregnant women.

The calculated value of 'z' (6.51) was significant at 0.05 level it shows a significant difference in

the means of niacin intake in both the working and non-working pregnant women. Mean intake of vitamin C by working and non-working pregnant women was (23.4±8.7mg) and (19.2±8.1mg) respectively. The consumption of vitamin C in both the working and non- working pregnant women was significantly (P<0.01) lower than the recommended levels. 'z' value (5.00) significant at 0.05 level reveals that working pregnant women had higher intake of vitamin C than non-working pregnant women. Folic acid mean intake by working and non-working pregnant women was (217.5±46.2µg) and (160.4 ± 49.8µg) respectively. Consumption of folic acid by working and non- working pregnant women was significantly (P<0.0 1) lower than the RDA value. 'z' value (5.64) significant at 0.05 level reveals that working pregnant women had higher intake of folic acid than the non-working pregnant women. Mean intake of vitamin D by working and non-working pregnant women was (142.4±29.7LU) and (133.3± 27.2LU) respectively. It was observed that mean intake by working and non-working pregnant women was significantly (P<0.01) lower than RDA. The calculated value of 'z' (3.20) was significant at 0.05 level this shows a significant difference in the means of intake of vitamin D in both the type of pregnant women. Statistical analysis of data reveals that working pregnant women had higher intake of vitamin D than the non- working pregnant women.

Table-5: Percent adequacy of Nutrient Intake Working Pregnant Women and Non-Working Pregnant Women

Sr. No.	Nutrients	Working Pregnant Women	Non-Working Pregnant Women
01.	Protein (gm)	68.6	61.5
02.	Energy (Kcal)	77.9	74.0
03.	Calcium (mg)	50.2	65.9
04.	Iron (mg)	66.5	59.7
05.	Carotene (µg)	81.0	73.5
06.	Thiamine (mg)	77.6	69.2
07.	Riboflavin (mg)	55.3	38.6
08.	Niacin (mg)	65.6	51.8
09.	Vitamin C (mg)	58.5	48.0
10.	Folic Acid (µg)	72.5	53.4
11.	Vitamin D (I.U)	71.2	66.6

From the above table, percent adequacy of nutrient intake by Working and Non-Working Pregnant Women, intake of protein was (68.6%) and (61.5%) of RDA by working and non- working pregnant women respectively. Energy intake was (77.9%) and (74%) of RDA by working and non-working expectant women, respectively. Calcium intake was (50.2%) and (65.9%) of RDA by working and non-working expectant women respectively. Iron intake was (66.5%) and 959.7%) of RDA by working and non-working expectant women respectively. Working and non-working pregnant women contained (81%) and (73.5%) of the required amount of carotene respectively. Working and non-working pregnant women provided (77.6%) and (69.2%) of the required thiamine respectively. Riboflavin intake was (55.3%) and (38.6%) of RDA by working and non-working pregnant women respectively. The niacin intake was (65.6%) and (51.8%) of RDA by working and non-working pregnant women respectively. The vitamin C intake was (58.5%) and (48%) of RDA by working and non-working pregnant women respectively. The folic acid intake was (72.5%) and (53.4%) of RDA by working and non-working pregnant women respectively. The vitamin D intake was (71.2%) and (66.6%) of RDA by working and non-working pregnant women respectively.

Table-6: Anthropometric Measurements of Working Pregnant Women and Non-Working Pregnant Women

Anthropometric Measurements	Working Pregnant Women Mean ± SD	Non-Working Pregnant Women Mean ± SD	Standard Value	'z' Value
Height (cm)	152.3 ± 7.3	148.5 ± 8.1	158	2.392
Weight (kg)	51.2 ± 5.7	52.6 ± 6.0	54	4.982

From the above table, mean and SD of height and weight of working and non-working pregnant women were (152.3 ±7.3cm) and (148.5 ± 8.1cm) and (51.2 ± 5.7kg) and (52.6 ± 6.0kg) respectively. The mean height and weight of working and non-working pregnant women was less than that of Indian reference women. The calculated value of 'z' (2.392) and (4.982) were significant at 0.05 levels and it

shows a significant difference in the means of height and weight in both the type of pregnant women.

Table-7: Body Mass Index of Working Pregnant Women and Non-Working Pregnant Woman

Sr. No.	Nutritional Grade	BMI	Working Pregnant Women (N=200)		Non-Working Pregnant Women (N=200)	
			F	%	F	%
01.	II Grade CED	16.0-17.0	3	1.5	7	3.5
02.	I Grade CED	17.1-18.5	7	3.5	14	7.0
03.	Low Normal	18.6-20.0	48	24.0	76	38.0
04.	Normal	20.1-25.0	137	68.5	93	46.5
05.	Overweight	25.1-30.0	5	2.5	9	4.5
06.	Obese	>30.0	0	0.0	1	0.5
Total			**200**	**100**	**200**	**100**

From the above table, among working pregnant women, maximum (68.5%) pregnant women were from normal category having 20.2- 25.0 BMI followed by low normal category (24%) having 18.5- 20.0 BMI. Among non-working pregnant women too, maximum (46.5%) pregnant women were from normal category followed by low normal category (38.0%). (1.5%) and (3.5%) of working and non-working pregnant women respectively were from II Grade chronic energy deficiency. (3.5%) and (7%) of working and non- working pregnant women respectively were from I Grade chronic energy deficiency. (5%) and (4.5%) of working and non-working pregnant women respectively were from overweight and non-working pregnant women only (0.5%) obese.

Table-8: Hemoglobin Level of Working Pregnant Women and Non - Working Pregnant Woman

Groups	Hemoglobin level (gm/dl) Mean ± SD	Standard Value	'z' Value
Working (N=200)	9.8 ± 0.7	12.0g/100 ml	24.43
Non-Working (N=200)	7.4 ± 1.2		

Significant at 0.05

From the above table, mean hemoglobin level of working and non-working pregnant women was 9.8 ± 0.7 and 7.4 ± 1.2 g/100 ml of blood respectively. It was lower than the standard value of 12.0g/100ml of blood. The calculated value of 'z' (24.43) was significant at 0.05 levels. Hence, it shows a significant difference in the means of hemoglobin in both the type of pregnant women.

Conclusion

Mean intake of cereals, pulses green leafy vegetables, roots and tubers, other vegetables, fruits, milk and milk products, fats and oils and sugar and jaggery was significantly ($P<0.01$) less than the recommended levels in working and non- working pregnant women. As compared to the non-working pregnant women, the working pregnant women had significantly more intake of cereals, pulses, green leafy vegetables, other vegetables and fruits. On the other hand, non-working pregnant women significantly consumed more of roots and tubers, milk and milk products and fats and oils. No significant difference was noted in the intake of sugar and jaggery between working and non-working pregnant women. In terms of adequacy level, it was observed that majority of the working and non-working pregnant women were consuming all the food groups in fewer amounts than the recommended allowances.

Mean intake of protein, energy, calcium, iron, carotene, thiamine, riboflavin, niacin, vitamin C, folic acid and vitamin D was significantly ($P<0.01$) less than the recommended allowances in working and non-working pregnant women. As compared to non-working pregnant women, working pregnant w omen had significantly more intake of all the above written nutrients except calcium. In terms of adequacy level, it was observed that majority of the working and non-working pregnant women were consuming all the nutrients in fewer amounts than the recommended allowances.

There is a significant difference in the means of height and weight in the working and non-working

pregnant women. Majority (68.5%) and (46.5%) of both the working and non- working pregnant women were in the category of normal BMI respectively. There is a significant difference in the means of hemoglobin in the working and non-working pregnant women.

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