

**Research Paper :**

## **Effect of dietary counselling on nutrient intake and performance status of breast cancer patients**

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### **ABSTRACT**

In present study, total 240 clinically proven female breast cancer patients were randomly selected, in which 120 were counseled patients kept in group-I and another 120 were non-counselled patients kept in group-II. There was no significant difference found between two groups in terms of base line nutrient intake and performance status. The information was collected with the help of questionnaire-cum-interview technique. Energy and fat intake was significantly decreased during two subsequent follow up in group-I due to diet counselling, on the other hand significantly increase in group-II. The findings of the present study suggested that diet counseling has significant impact on intake of adequate nutrients responsible for prevention of breast cancer and to acquire maximum performance status in terms of Kernofsky scale in order to minimize the complaints encountered by the patients.

**Key words :** Breast cancer, Counseled group, Non-counseled group

Carcinoma of the breast cancer is the most site-specific cancer in women and females. The mortality from breast cancer appears to have decreased by 30% over the last decade in western world. In 1970, the probability of a women in the United States developing breast cancer was estimated 1 in 13; in 1980 it was 1 in 11 and in 1996 it was 1 in 8 (Bland *et al*, 1999).

In India, breast cancer is the second cancer in female after carcinoma cervix. It is rapidly catching up with cervical cancer as the most common cause of cancer among Indian women. A recent publication also confirmed earlier observations that breast cancer has replaced cervical cancer as the leading site of cancer among women in Indian cities (Mudur, 2005).

Changes in diet seems to be an important prevention strategy to reduce the incidence of breast cancer. A relationship has been established between cancer and a high fat diet; the latter has been found to be associated with an increased risk of breast cancer. A diet high in fibre, conversely; seems to have a preventive influence on this disease. Vitamin A, beta-carotenes and vitamin which act as antioxidant agents may help to protect cells from becoming malignant (Kalb, 1990). Therefore, present study was conducted to know the nutrient intake of breast cancer.

### **METHODOLOGY**

Overall two hundred forty histo-pathologically proven female breast cancer patients were randomly selected from the surgical oncology Department of Sir Sunder Lal Hospital B.H.U., Varanasi. These cases were divided in

two groups of 120 each. The patients in group-I were provided diet counseling along with drug therapy. On the other hand group-II patients were not provided such benefits and they was considered exclusively non-counseled, but they received drug therapy. As such group I was designed as counseled group and group II as non counseled group. Due to various constraints, only 58 (24.2%) participated in follow-up visits, of them 30 patients (25.0%) and 28 (23.3%) belonged to counseled group and non-counseled group, respectively.

A performed questionnaire was used to record personal data, anthropometric measurements, dietary intake and activity record of the selected women.

Anthropometric measurements height (cm), weight (kg.), BMI (kg/m<sup>2</sup>) were recorded for all the two hundred forty subjects.

The dietary intake of all the women was assessed by interviewing the women with the help of household measures relevant to Indian cuisine models to construct the individual women's 24-hour food intake. Raw amounts for the cooked food items were derived by standardizing the preparatory methods of different menu items.

The data were tabulated and subjected to appropriate statistical analysis.

### **FINDINGS AND DISCUSSION**

The findings obtained from the present study have been discussed under following subheads :

#### **Background informations:**

It is evident from Table 1 that more then two fifth

overall patients (40.8%) belonged to age-group 40-50 years, followed by more than 50 years (33.1%) and 30-40 years (22.1%). In addition, 5.0% overall patients were related to > 30 years age group. The mean $\pm$ S.D. age of the breast cancer patients was computed 45.0 $\pm$ 8.63 years. Majority of the breast cancer patients (92.1%) were Hindu. More than half of the overall patients (55.8%) belonged to joint family, followed by nuclear (44.4%).

It was observed that more than two fifth overall patients (42.5%) were illiterate. There were only 9.2% patients, who were educated up to graduation or above. Majority of the overall patients (91.7%) were house-wives. According to socio-economic status nearly two fifth overall patients (36.7%) belonged to upper middle class.

### Dietary habits of study subjects:

Nearly three fifth overall patients (57.1%) were habituated for vegetarian diets and the remaining (42.9%) for non vegetarian (Table 2).

### BMI of respondents:

Nearly two fifth of overall patients (38.3%) belonged to normal limit (18.5-22.9kg/m<sup>2</sup>) among the obese patients more than one fourth of overall patients (26.3%) belonged to obese I, followed by at risk BMI 23.0 to 24.9kg/m<sup>2</sup> (16.7%) and obese II and more than 30 kg/m<sup>2</sup> (8.8%). The mean  $\pm$  S.D. body mass index was ascertained 23.63 $\pm$ 4.43 (Table 3). The mean BMI ascertained in the present study fully agrees with the observation reported by Pakseresht *et al.* (2009) as they mentioned in the range of 18.5–24.99.

### Protein intake:

The mean  $\pm$ SD amounts of protein intake in counseled (group I) patients were computed 44.06 $\pm$ 8.67; 45.60 $\pm$ 8.4 and 47.01  $\pm$ 8.02 g at base line, I follow-up and II nd follow up, respectively. Though there is slight variation in mean levels of protein, but the differences were observed statistically insignificant ( $p>0.05$ ). This feature showed adherence to the strategy counseled with them (Table 4).

On the other hand the mean protein intake were found significantly reduced at I follow up ( $t=3.619$ ,  $df=54$ ,  $p<0.001^{***}$ ) and II follow up ( $t=4.786$ ,  $df=54$ ,  $p<0.001^{**}$ ) visit with respect to mean amount of protein intake at base line of the study. The variations in mean protein level was caused due to non-counseling of the patients consuming protein according to their own will.

### Fat intake:

Low fat intake is recommended for the prevention of breast cancer. In the present study, the mean  $\pm$ SD

**Table 1: Background information of the selected women**

| Demographic characteristics   | Number | Percentage |
|-------------------------------|--------|------------|
| <b>Age</b>                    |        |            |
| <30                           | 12     | (5.0)      |
| 30-40                         | 53     | (22.1)     |
| 40-50                         | 98     | (40.8)     |
| >50                           | 77     | (33.1)     |
| <b>Religion</b>               |        |            |
| Hindu                         | 221    | (92.1)     |
| Muslim                        | 8      | (3.3)      |
| Sikh                          | 5      | (2.1)      |
| Christian                     | 6      | (2.1)      |
| <b>Family type</b>            |        |            |
| Nuclear                       | 106    | (44.4)     |
| Joint                         | 134    | (55.8)     |
| <b>Education</b>              |        |            |
| <b>Illiterate</b>             | 102    | (42.5)     |
| Primary                       | 62     | (25.8)     |
| Upto high                     | 34     | (14.2)     |
| Intermediate                  | 20     | (8.3)      |
| Graduate                      | 06     | (2.5)      |
| Post Graduate                 | 16     | (6.7)      |
| <b>Occupation</b>             |        |            |
| House-wife                    | 220    | (91.7)     |
| Govt. service                 | 12     | (5.0)      |
| Private service               | 6      | (2.5)      |
| Business                      | 2      | (0.8)      |
| <b>*Socio-economic status</b> |        |            |
| Lower                         | 7      | (2.9)      |
| Lower-middle                  | 29     | (12.1)     |
| Middle                        | 63     | (26.3)     |
| Upper-middle                  | 88     | (36.7)     |
| Upper                         | 53     | 22.1       |

**Table 2 : \*Type of diet**

|                | Number | Percentage |
|----------------|--------|------------|
| Vegetarian     | 137    | 57.1       |
| Non-vegetarian | 103    | 42.9       |

amounts of fat intake by the non-counseled patients were ascertained 30.19 $\pm$ 5.35g ; 34.76 $\pm$ 3.99g and 33.36 $\pm$ 4.03g at base line and successive follow up visit. The mean values of fat intake were found significantly increasing with the follow up visit (Table 4).

On the other hand the mean  $\pm$ SD amounts of fat consumption by counseled patients were ascertained 30.45 $\pm$ 6.46g at base line; 23.54 $\pm$ 7.27 g at I follow up and 24.96 $\pm$ 7.31 g at II follow up visit. The statistical analysis suggested that the fat consumption was significantly reduced at follow up visits I ( $t=3.891$ ,  $df=58$ ,  $p<0.001$  the)

**Table 3 : Body mass index of the respondents**

| BMI             | Group-I          | Group-II         | Total            |
|-----------------|------------------|------------------|------------------|
|                 | No. (%)          | No. (%)          | No. (%)          |
| <18.5           | 12(10.0)         | 12 (10.0)        | 24 (10.0)        |
| 18.5–22.9       | 46 (38.3)        | 46 (38.3)        | 92 (38.3)        |
| 23.0–24.9       | 23 (19.2)        | 17(14.2)         | 40 (16.7)        |
| 25.0 –29.9      | 30 (25.0)        | 33 (27.5)        | 63 (26.3)        |
| >30             | 09(7.5)          | 12 (10.0)        | 21 (18.8)        |
| Total           | 120 (100)        | 120 (100)        | 240 (100)        |
| Mean $\pm$ S.D. | 23.52 $\pm$ 4.32 | 23.52 $\pm$ 4.55 | 23.63 $\pm$ 4.43 |

t=0.385; df=238; p&gt;0.05 NS

NS-Non significant

and II (t=3.083, df=58, p<0.01\*\*) with respect to base line. This finding is fully in accordance to our hypothesis that there was significant reduction in fat intake due to diet counseling of the group I patients.

### Carbohydrate intake :

In the present study, the mean $\pm$ SD amounts of carbohydrate in non-counseled patients were ascertained 220 follow up first and second. There was no regular trend of increase or decrease in carbohydrate amounts at successive follow up visits and therefore varied changes were obtained between two follow ups. The mean amount

of carbohydrate was found decreased as I follow up visit (t=7.371, df=54.30 $\pm$ 15.59 g ; 182.96 $\pm$ 21.81 g and 197.40 $\pm$ 11.63g at base line; I, p<0.001\*\*\*), while there was significantly increase at II follow up visit (t=3.051, df=54, p<0.01\*\*). The irregular trend in carbohydrate intake happened due to non-counseling of the group II patients.

On the other hand mean $\pm$ SD amounts of carbohydrate intake in counseled patients were computed 222.92 $\pm$ 42.21g at base line; 214.21 $\pm$ 40.82 g at I follow up and 202.92 $\pm$ 13.22g at II follow up visit.

There was decreasing trend in carbohydrate intake by the counseled patients though significant decrease was observed at II follow up visit (t=2.476, df=58, p<0.02\*\*). Only this feature existed due to adherence to the strategy employed in diet counseling (Table 4).

### Energy intake :

Michels and Ekborns (2005) reviewed that calorie restriction has a favourite impact on breast cancer risk. In the present study, the mean $\pm$ SD amounts of energy intake were 1331.63 $\pm$ 188.68 K Cal; 1197.15 $\pm$ 120.64 K cal and 1212.65 $\pm$ 1171.99 K cal at base line, I follow up and II follow up period in counseled group. The statistical analysis suggested significant decrease in energy intake

**Table 4 : Mean intake of energy, fibre and calcium of respondents**

| Mean nutrient intake          | Group- I (n=30)                |                    |                    | Group-II (n=28)                |                    |                    |
|-------------------------------|--------------------------------|--------------------|--------------------|--------------------------------|--------------------|--------------------|
|                               | Base Line                      | Ist Follow up      | IInd Follow up     | Base Line                      | Ist Follow up      | IInd Follow up     |
| <b>Protein</b>                | 44.06 $\pm$ 8.67               | 45.60 $\pm$ 8.14   | 47.01 $\pm$ 8.02   | 43.97 $\pm$ 4.19               | 40.47 $\pm$ 2.94   | 39.15 $\pm$ 3.29   |
| Base line vs. 1st Followup    | t = 0.710; df = 58; p > 0.05NS |                    |                    | t = 3.619; df = 54; p < 0.001  |                    |                    |
| Base line vs. 2nd Followup    | T = 1.369; df = 58; p > 0.05NS |                    |                    | t = 4.786; df = 54; p < 0.001  |                    |                    |
| 1st Followup vs. 2nd Followup | T = 0.676; df = 58; p > 0.05NS |                    |                    | t = 1.583; df = 54; p > 0.05NS |                    |                    |
| <b>FAT</b>                    | 30.45 $\pm$ 6.46               | 23.54 $\pm$ 7.27   | 24.96 $\pm$ 7.31   | 30.19 $\pm$ 5.35               | 34.76 $\pm$ 3.99   | 33.36 $\pm$ 4.03   |
| Base Line vs. 1st Followup    | t = 3.891; df = 58; p < 0.001  |                    |                    | t = 3.624; df = 54; p < 0.001  |                    |                    |
| Base Line vs. 2nd Followup    | t = 3.083; df = 58; p < 0.01   |                    |                    | t = 2.504; df = 54; p < 0.02   |                    |                    |
| 1st Followup vs. 2nd Followup | t = 0.753; df = 58; p > 0.05NS |                    |                    | t = 1.306; df = 54; p > 0.05NS |                    |                    |
| <b>CHO</b>                    | 222.92 $\pm$ 42.21             | 214.21 $\pm$ 40.82 | 202.92 $\pm$ 13.22 | 220.30 $\pm$ 15.59             | 182.96 $\pm$ 21.81 | 197.40 $\pm$ 11.63 |
| Base Line vs. 1st Followup    | t = 0.812; df = 58; p > 0.05NS |                    |                    | t = 7.371; df = 54; p < 0.001  |                    |                    |
| Base Line vs. 2nd Followup    | t = 2.476; df = 58; p < 0.02   |                    |                    | t = 6.230; df = 54; p < 0.001  |                    |                    |
| 1st Followup vs. 2nd Followup | t = 1.441; df = 58; p > 0.05NS |                    |                    | t = 1.659; df = 54; p < 0.01   |                    |                    |

NS-Non significant

at I ( $t=3.289$ ,  $df=58$ ,  $p<0.01^{**}$ ) and II follow up ( $t=2.553$ ,  $df=58$ ,  $p<0.02^{**}$ ) visit with respect to base line intake (Table 5).

On the other hand the mean  $\pm$  SD amounts of the energy intake in non-counseled group were computed 1328.69 $\pm$ 71.82 K Cal; 1304.48 $\pm$ 95.81 K Cal and 1341.27 $\pm$ 79.84 K cal at base line and subsequent follow up visits, respectively the statistical analysis emphasized insignificant variation ( $p>0.05$  NS) between two mean energy intakes. The significant reduction in energy intake in counseled group and stationary nature of energy intake in non-counseled patients in accordance to the hypothesis that diet counseling had positive impact on intake of energy by the diet counseling.

### Fibre intake :

In the present study, the mean  $\pm$  SD amount of fibre intake by the non-counseled patients were assessed 5.64 $\pm$ 2.13 g ; 3.77 $\pm$ 1.88 g and 3.00 $\pm$ 1.74 g at base line and subsequent follow up visits, respectively. It is evident that the amount of fibre intake was decreasing significantly at I ( $t=3.482$ ,  $df=54$ ,  $p<0.001^{***}$ ) and II follow up visit ( $t=5.077$ ,  $df=54$ ,  $p<0.001^{***}$ ) in comparison to base line intake. This finding is absolutely against the strategy of diet counseling. On the other hand, the mean  $\pm$  SD amounts of fibre intake were assessed 7.02  $\pm$  1.86 g at base line ;

9.09  $\pm$  2.26 g at I follow up and 10.4  $\pm$  2.78 g at II follow up visit. The mean amounts of fibre intake were significantly increasing at Ist follow up ( $t= 3.876$ ,  $df = 58$ ,  $p< 0.001^{***}$ ) as well as IInd follow up ( $t = 5.532$ ,  $df = 58$ ,  $p< 0.001^{***}$ ) visit. these findings are in lines with the diet counseling (Table 5).

### Calcium intake :

The mean  $\pm$  SD levels of calcium intake in non-counseled patients were ascertained 129.81  $\pm$  7.67 mg and 120.00  $\pm$  9.69 mg and 116.68  $\pm$  7.60 mg at base line and subsequent follow up visits. There was significant decreasing trend ( $p< 0.001^{***}$ ) in calcium intake by the group II patients. On the other hand mean  $\pm$  SD levels in counseled group were assessed 122.07  $\pm$  12.82 mg ; 123.76  $\pm$  5.58 mg and 128.01  $\pm$  9.73 mg at base line and subsequent follow up visits, respectively. The trends of calcium intake was found increasing with the experimentation periods and there was significant increase in calcium level at the II follow up visit ( $t = 2.022$ ,  $df = 58$ ,  $p > 0.05$ ) this finding is in full agreement with the counseling strategy (Table 5).

### Iron intake :

Iron is one of the important nutrients in prevention of breast cancer. As such increased amount of iron intake

**Table 5: Mean intake of energy, fibre and calcium of respondents**

| Mean nutrient intake          | Group- I (n=30)                       |                      |                      | Group-II (n=28)                       |                      |                      |
|-------------------------------|---------------------------------------|----------------------|----------------------|---------------------------------------|----------------------|----------------------|
|                               | Base Line                             | Ist Follow up        | IInd Follow up       | Base Line                             | Ist Follow up        | IInd Follow up       |
| <b>Energy</b>                 | 1131.63 $\pm$ 188.68                  | 1197.15 $\pm$ 120.64 | 1212.65 $\pm$ 171.99 | 1328.69 $\pm$ 71.82                   | 1164.48 $\pm$ 195.81 | 1171.27 $\pm$ 109.84 |
| Base line vs. 1st Followup    | $t = 1.602$ ; $df = 58$ ; $p = 0.115$ |                      |                      | $t = 7.450$ ; $df = 54$ ; $p = 0.000$ |                      |                      |
| Base line vs. 2nd Followup    | $t = 1.738$ ; $df = 58$ ; $p = 0.087$ |                      |                      | $t = 6.347$ ; $df = 54$ ; $p = 0.000$ |                      |                      |
| 1st Followup vs. 2nd Followup | $t = 0.404$ ; $df = 58$ ; $p = 0.687$ |                      |                      | $t = 1.060$ ; $df = 54$ ; $p = 0.294$ |                      |                      |
| <b>Fibre</b>                  | 7.02 $\pm$ 1.86                       | 9.09 $\pm$ 2.26      | 3.77 $\pm$ 1.88      | 5.64 $\pm$ 2.13                       | 10.40 $\pm$ 2.78     | 3.00 $\pm$ 1.74      |
| Base line vs. 1st Followup    | $t = 3.882$ ; $df = 58$ ; $p = 0.000$ |                      |                      | $t = 3.475$ ; $df = 54$ ; $p = 0.001$ |                      |                      |
| Base line vs. 2nd Followup    | $t = 5.533$ ; $df = 58$ ; $p = 0.000$ |                      |                      | $t = 5.075$ ; $df = 54$ ; $p = 0.000$ |                      |                      |
| 1st Followup vs. 2nd Followup | $t = 1.997$ ; $df = 58$ ; $p = 0.051$ |                      |                      | $t = 1.592$ ; $df = 54$ ; $p = 0.117$ |                      |                      |
| <b>Calcium</b>                | 122.07 $\pm$ 12.82                    | 128.01 $\pm$ 9.73    | 123.76 $\pm$ 5.59    | 129.81 $\pm$ 7.67                     | 130.00 $\pm$ 9.69    | 116.78 $\pm$ 7.60    |
| Base line vs. 1st Followup    | $t = 2.021$ ; $df = 58$ ; $p = 0.048$ |                      |                      | $t = 3.376$ ; $df = 54$ ; $p = 0.001$ |                      |                      |
| Base line vs. 2nd Followup    | $t = 2.704$ ; $df = 58$ ; $p = 0.009$ |                      |                      | $t = 6.384$ ; $df = 54$ ; $p = 0.000$ |                      |                      |
| 1st Followup vs. 2nd Followup | $t = 0.796$ ; $df = 58$ ; $p = 0.429$ |                      |                      | $t = 3.912$ ; $df = 54$ ; $p = 0.000$ |                      |                      |

NS-Non significant

has been recommended under the diet counseling. In the present study, the mean  $\pm$  SD of iron intakes in non-counseled group were assessed  $28.03 \pm 6.59$  mg ;  $24.87 \pm 5.20$  mg and  $20.90 \pm 5.34$  mg at successive follow up visits. The mean amounts were found statistically similar through out the study periods ( $p > 0.05$  NS). on the other hand the diet counseled patients consumed  $18.99 \pm 6.18$  mg at base line  $23.60 \pm 6.04$ mg at I follow up and  $23.12 \pm 5.79$  mg at II follow up period. The mean amounts were found significantly increased ( $p < 0.01^{**}$ ) at successive follow up visits. This finding is in accordance to our diet counseling strategy (Table 6).

#### Vitamin A intake :

Protective role of vitamin A or carotene intake in breast cancer has been emphasized in various studies (Hunter *et al.*, 1990, Rohan, 1993 and Kritchevsky, 1990) . The mean  $\pm$ SD amounts of vitamin A intake were ascertained  $431.25 \pm 79.00$ ;  $427.07 \pm 77.36$  and  $416.39 \pm 81.05$  units at successive follow up visits in non-counseled patients. The mean values were found insignificantly reducing during follow up visits ( $p > 0.05$ , NS). On the other hand, mean  $\pm$ SD values in counseled group were assessed  $447.70 \pm 102.11$ ;  $453.53 \pm 108.45$  and  $461.51 \pm 77.79$  units at subsequent follow up visits. Though there was increasing tendency in vitamin A consumption

by the counseling patients, but the differences between mean intakes were evidenced statistically in significant ( $p > 0.05$  NS) (Table 6).

#### Vitamin C intake :

Vitamin C has antioxidant quality and significantly helps in prevention of cancer of various nature (Hunter *et al.*, ). So far as consumption of vitamin C was concerned, the non-counseled patients consumed  $117.49 \pm 14.21$  unit at basal period;  $113.00 \pm 20.94$  unit at follow up and  $105.83 \pm 19.37$  unit at II follow up period. There was decreasing trend in vitamin C intake and the mean intake at II follow up period was significantly decreased ( $t = 2.568$ ,  $df = 54$ ,  $p < 0.02^{**}$ ) with respect to base line observation. On its contrary the mean  $\pm$ SD amounts of vitamin C intake in counseled patients were computed  $117.08 \pm 14.54$ ;  $123.53 \pm 14.03$  and  $125.57 \pm 13.98$  units at subsequent follow up periods. There was increasing trend in vitamin C intake by the counseled patients. The mean amount at II follow up period was found significantly more ( $t = 2.305$ ,  $df = 58$ ,  $p < 0.05^{*}$ ) in comparison to basal period, respectively. The statistical analysis emphasized significant deterioration in performance status at 1st follow up ( $p < 0.01^{**}$ ) as well as at IIInd follow up visit ( $p < 0.001^{***}$ ) (Table 6).

**Table 6: Mean intake of Iron, Vitamin A, Vitamin C of respondents**

| Mean nutrient intake          | Group- I (n=30)                       |                     |                    | Group-II (n=28)                       |                     |                    |
|-------------------------------|---------------------------------------|---------------------|--------------------|---------------------------------------|---------------------|--------------------|
|                               | Base Line                             | Ist Follow up       | IIInd Follow up    | Base Line                             | Ist Follow up       | IIInd Follow up    |
| <b>Iron</b>                   | $18.99 \pm 6.18$                      | $23.60 \pm 6.04$    | $23.12 \pm 5.79$   | $28.03 \pm 6.59$                      | $24.87 \pm 5.20$    | $20.90 \pm 5.34$   |
| Base line vs. 1st Followup    | $t = 2.918$ ; $df = 58$ ; $p = 0.005$ |                     |                    | $t = 2.967$ ; $df = 54$ ; $p = 0.004$ |                     |                    |
| Base line vs. 2nd Followup    | $t = 3.986$ ; $df = 58$ ; $p = 0.000$ |                     |                    | $t = 4.450$ ; $df = 54$ ; $p = 0.000$ |                     |                    |
| 1st Followup vs. 2nd Followup | $t = 0.876$ ; $df = 58$ ; $p = 0.384$ |                     |                    | $t = 1.488$ ; $df = 54$ ; $p = 0.143$ |                     |                    |
| <b>Vitamin A</b>              | $447.70 \pm 102.11$                   | $453.53 \pm 108.45$ | $427.07 \pm 77.36$ | $431.25 \pm 79.00$                    | $461.51 \pm 101.79$ | $416.39 \pm 81.05$ |
| Base line vs. 1st Followup    | $t = 0.214$ ; $df = 58$ ; $p = 0.831$ |                     |                    | $t = 0.200$ ; $df = 54$ ; $p = 0.842$ |                     |                    |
| Base line vs. 2nd Followup    | $t = 0.525$ ; $df = 58$ ; $p = 0.602$ |                     |                    | $t = 0.695$ ; $df = 54$ ; $p = 0.490$ |                     |                    |
| 1st followup vs. 2nd Followup | $t = 0.294$ ; $df = 58$ ; $p = 0.770$ |                     |                    | $t = 0.504$ ; $df = 54$ ; $p = 0.616$ |                     |                    |
| <b>Vitamin C</b>              | $117.08 \pm 14.54$                    | $123.53 \pm 14.03$  | $113.00 \pm 20.94$ | $117.49 \pm 14.21$                    | $125.57 \pm 13.98$  | $105.83 \pm 19.37$ |
| Base line vs. 1st Followup    | $t = 1.749$ ; $df = 58$ ; $p = 0.086$ |                     |                    | $t = 0.938$ ; $df = 54$ ; $p = 0.352$ |                     |                    |
| Base line vs. 2nd Followup    | $t = 2.304$ ; $df = 58$ ; $p = 0.025$ |                     |                    | $t = 2.568$ ; $df = 54$ ; $p = 0.013$ |                     |                    |
| 1st Followup vs. 2nd Followup | $t = 0.562$ ; $df = 58$ ; $p = 0.576$ |                     |                    | $t = 1.330$ ; $df = 54$ ; $p = 0.189$ |                     |                    |

NS-Non significant



**Table 7 : Performance status of respondents at their successive follow up visit**

| Range of performance status                           | Group- I                        |       |                           |       |                           |       | Group -II                       |       |                           |       |                           |       |
|---|---------------------------------|-------|---------------------------|-------|---------------------------|-------|---------------------------------|-------|---------------------------|-------|---------------------------|-------|
|   | Base line                       |       | I <sup>st</sup> Follow up |       | II <sup>nd</sup> Followup |       | Base line                       |       | I <sup>st</sup> Follow up |       | II <sup>nd</sup> Followup |       |
|   | No.                             | %     | No.                       | %     | No.                       | %     | No.                             | %     | No.                       | %     | No.                       | %     |
| 50-60   | 11                              | 36.7  | 1                         | 3.3   | 0                         | 0.0   | 5                               | 17.9  | 9                         | 32.1  | 17                        | 60.7  |
| 60-70   | 10                              | 33.3  | 14                        | 46.7  | 7                         | 23.3  | 7                               | 25.0  | 11                        | 39.3  | 8                         | 28.6  |
| 70-80   | 6                               | 20.0  | 9                         | 30.0  | 13                        | 43.3  | 8                               | 28.6  | 7                         | 25.0  | 3                         | 10.7  |
| 80-90   | 3                               | 10.0  | 5                         | 16.7  | 6                         | 20.0  | 5                               | 17.9  | 1                         | 3.6   | 0                         | 0.0   |
| 90-100  | 0                               | 0.0   | 1                         | 3.3   | 4                         | 13.3  | 3                               | 10.7  | 0                         | 0.0   | 0                         |       |
| Total   | 30                              | 100.0 | 30                        | 100.0 | 30                        | 100.0 | 28                              | 100.0 | 28                        | 100.0 | 28                        | 100.0 |
| Mean ± SD   | 70.33 ± .99                     |       | 77.00 ± 9.15              |       | 82.33 ± 9.71              |       | 77.50 ± 3.23                    |       | 69.29 ± 9.79              |       | 62.86 ± 9.37              |       |
| Statistical Significance                              | Group - I                       |       |                           |       |                           |       | Group -II                       |       |                           |       |                           |       |
| Base line vs. 1 <sup>st</sup> followup                | t = 2.694 ; df = 58; p = 0. 009 |       |                           |       |                           |       | t = 2.642; df = 54; p = 0.011   |       |                           |       |                           |       |
| Base line vs. 2 <sup>nd</sup> followup                | t = 4.716 ; df = 58; p = 0. 000 |       |                           |       |                           |       | t = 4.779 ; df = 54; p = 0.000  |       |                           |       |                           |       |
| 1 <sup>st</sup> Followup vs. 2 <sup>nd</sup> followup | t = 2.189 ; df = 58; p = 0. 033 |       |                           |       |                           |       | t = 2.510 ; df = 54; p = 0. 015 |       |                           |       |                           |       |

### Performance status :

A hundred per cent performance status in breast cancer patients showed absence of complaints, while decreasing value of performance status showed severity of the complaints *i.e.* there was inverse association between performance status and presence of complaints to the patients (Table 7). In the present study, there was increasing trend in performance status of the counseled patients (Table 7). In the present study, there was increasing trend in performance status of the counseled patients. The mean $\pm$ SD values of performance status were assessed 70.33 $\pm$ 9.99; 77.00 $\pm$ 9.15 and 82.33 $\pm$ 9.71% at base line; first follow up and second follow up visits the performance status was found significantly increasing at first (p<0.01\*\*) and second follow up visits (p<0.001\*\*\*). This finding shows significant decrease in complaints of the counseled patients. Most probably this features is associated with diet counseling of the patients.

The statistical analysis emphasized significant deterioration in performance status at 1st follow up (p<0.01\*\*) as well as at II<sup>nd</sup> follow up visit (p<0.001\*\*\*). This feature shows that the complaints in non-counseled patients are significant increasing with subsequent follow up visit. Most probably non-counseling is one of the cause of increased complaints in this group of patients (Table 7).

These findings supported the hypothesis that diet counseling to the breast cancer patients reduced the complaints significantly. Patients in both the groups were found statistically similar regarding their nutritional aspects.

### Conclusion:

The findings of the present study suggests that diet counseling has significant impact on intake of adequate nutrients responsible for prevention of breast cancer and

to acquire maximum performance status in terms of Kernofsky scale in order to minimize the complaints encountered by the patients.

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