

Nutritional status index of post-menopausal women and pre-menopausal women

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Woman is one of the most important parts of the family and society, and community health is dependent on provision of the needs of this group. Menopause is one of the most critical stages of life among women. The present study aims to assess the nutritional status index of post-menopausal women and pre-menopausal women. Pre-tested interview schedule was administered in person to the women by the investigator and ANOVA test was used to interpret the results. The mean value of nutritional status index in control group consisting of pre-menopausal women of urban area was significantly greater than that of the counter part in rural area and also the experimental group consisting of post-menopausal women in rural and urban areas. The nutritional status index of experimental group of urban area was also significantly greater than the counterpart in rural area. Hence, the urban experimental and control group were found to have significantly greater nutritional status index than the rural experimental and control group.

Key Words : Post-menopausal women, Pre-menopausal women, Nutritional status index (NSI)

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INTRODUCTION

From menarche to menopause there are lot of biological changes in women's body and its effect on mind and health in totality need to be looked carefully (Murthy, 2003). Menopause is defined as the time at which menstruation ceases, whereas climacteric is the phase of waning ovarian activity and may start two or three years before the menopause and continue for two to five years after it. The climacteric is thus a phase of adjustment between active and inactive ovarian function and may occupy several years of a woman's life (Padubidri *et al.*, 1999). According to Becker *et al.* (2002), menopause is defined as the cessation of menses, represents an important developmental milestone in a woman's life.

Menopause begins after a woman's last period. A woman is considered to be in menopause after she hasn't menstruated for a full year. But before that happens, women go through a phase known as the climacteric, or perimenopause. At this

time, the ovaries get smaller and produce less estrogen. This drop in estrogen level causes the hot flashes, night sweats, vaginal dryness, skin changes, sleep difficulties, mood swings depression and weight gain experienced by some women. The drop in estrogen often alters a woman's period, which may become heavier or lighter, longer or shorter or irregular. (Hansen, 1995).

Menopause is a process and not a disease opines Hansen (1995). Most women hit menopause around age 51. Some women go through it earlier, an estimated 1 per cent do so before age 40.

Menopause usually occurs between the ages of forty-eight and fifty-two. Extreme fatigue and drowsiness are also symptoms of type II diabetes in post-menopausal women. "High doses of estrogen and progesterone require larger doses of insulin than low doses of estrogen and progesterone" (Rosenthal, 2005).

According to Ramkumar (1990) menopause is the physiological end of reproductive life of a woman between 45 to 55 years of life, but may occur earlier. There are many physical and emotional symptoms during this period such as hot flushes, night sweats, anxiety, tension and mood-swings.

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These are due to the changes in the imbalance of internal hormonal Milan and are self-limiting.

In women between the ages of 45-55 years, level of estrogen and progesterone decline naturally, and menstrual cycle stops. There are three type of menopause- Natural, Premature and Artificial menopause. Sometimes due to any disease or genetic defect, menopause occurs before 40 years of age, known as premature menopause. In some cases, cancer treatment or removal of both ovaries drop the level of estrogen and progesterone, which stop the period permanently, known as artificial menopause (Ganong,1999). Post-menopausal women have reached an age when the incidence of chronic health conditions become more prevalent. The health consequences of obesity include increased risk of heart disease, hypertension, diabetes, sleep apnea, cancer, osteoarthritis and mental health problems (Dannis, 2002).

A number of menopausal women are projected to increase rapidly from a total of 467 million to 1200 million by 2030 all around the world. The great majority of increase will occur in the developing countries. The rate of increase in the number of post-menopausal women is substantially faster in developing world than in industrialized world. Post-menopausal women will be increasing as a proportion of the total population from 9 per cent in 1990 to 14 per cent in 2030 (Hill,1996).

Various studies have been carried out to assess the nutritional requirements of the women in general and recommendations in particular have been made for additional requirements during pregnancy and lactation. However, data relating to nutritional status index in reproductive and post-menopausal years, which can give a comparative picture, are very few. The present study, therefore, was planned to assess the nutritional status index in women at different stages of reproductive years and also in post-menopausal years.

METHODOLOGY

The area selected for the study was Thiruvananthapuram district. In Thiruvananthapuram district, Chirayinkeezhu (rural) and Thiruvananthapuram taluk (urban) were selected by purposive sampling method. Post-menopausal women between the age 45-55 years were selected. A total of 600 post-menopausal women who had completed minimum one year after their last mensus and also not more than two years after the attainment of menopause were carefully selected from the identified women. Of the 1507 women who had not attained menopause, 100 women subjects of the same socio-economic background and same mean age were taken at random as the control group for the purpose of comparison with experimental group. Direct interview method was used to collect the information on background information of selected subjects using the formulated questionnaire. Anthropometric indices (Jelliffe, 1966; Hanumantha and

Vijayaraghavan, 1996) such as height (cm), weight (kg), BMI (kg/m^2), waist-hip ratio and biochemical profile (Varley, 2003) namely haemoglobin by colorimetric method. The nutrient intakes of all the subjects were assessed by 24 hour dietary recall method.

Developing nutritional status index :

NSI is an indicator of social well being of a community (Sreenath, 1988). In the present study, nutrient intake (calcium, phosphorus, iron), body mass index, waist-hip ratio and haemoglobin level were taken into consideration for the computation of this Index. NSI was computed for 600 post-menopausal women and 200 pre-menopausal women.

Let there be 'n' random variables x_1, x_2, \dots, x_n which are considered to be determinants of the nutritional status of an individual. Let 'm' observation be taken on these variables (or let there be 'm' respondents).

Thus, if x_{ij} ; $1 \leq i \leq m$, $1 \leq j \leq n$ be the observation matrix, then an index 'pj' is defined for each individual, $1 \leq i \leq m$ as follows :

$$P_i = \sum_{j=1}^n w_j \cdot x_{ij}$$

where, $w_j = 1/s_j^2$ being the sample variance of x_{ij} . This index p_i is defined as the NSI.

OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as relevant discussion have been summarized under the following heads :

Comparison of nutritional status index :

The mean and co-efficient of variance of both experimental group consisting of post-menopausal women and control group of pre-menopausal women is presented in Table 1.

Table 1 depicts that the mean value of nutrition status index in urban experimental group and control group were 9 and 9.93, respectively while the mean value were 8.05 and 8.01 for rural experimental and control group. The percentage of co-efficient of variance in nutrition status index for urban experimental and control group were 8.87 and 7.84, respectively. While the co-efficient of variance in nutrition status index for rural experimental and control group were

Table 1 : Mean and co-efficient of variance of NSI by their place of residence

	Rural		Urban	
	Experimental (n=300)	Control (n=100)	Experimental (n=300)	Control (n=100)
N	300	100	300	100
Mean	8.05	8.01	9	9.93
C.V. (%)	16.57	13.86	8.87	7.84

16.57 and 13.86, respectively. This indicated there was wide difference in index variables in rural than in urban area.

The women of both experimental and control groups were classified according to their nutritional status index into the hierarchal order of low, medium and high. Thus, women having their nutritional status index of one standard deviation less than the general mean were categorized as low and women having their nutritional status index greater than one standard deviation plus the general mean was classified as high category and the rest were grouped in the median category. The distribution of the subjects based on their nutritional status index is presented in Table 2.

Table 2 reveals that when the subjects were grouped after computing their nutrition status index, it was found that among the experimental group in urban area, 31.33 per cent had a higher index and 67.67 per cent had an average index. While it was the reverse in rural area where 29.67 per cent had a low index and 69.67 per cent had an average nutrition status index. Hence, the index values are more concentrated in low and medium status in rural areas in contrast to this, the index values centred towards medium and high values in urban area.

In the control group of premenopausal women in rural area, 36 per cent had low index value and 61 per cent had average nutritional status index, only 3 per cent had a higher index value however, the nutritional status index of 73 per cent was average in urban area and 27 per cent of them had a higher index. Hence, the nutritional status index values of pre-menopausal women were clustered around the average index and higher nutritional status index in urban area while the scene was entirely opposite in rural area where the values were more concentrated in poor index status and medium index status. In short, irrespective of the menopausal status, urban women were having better nutritional status than women in rural area. The diagrammatic representation of the data is given in Fig. 1.

ANOVA table was developed based on the NSI values and is presented in Table 3.

From Table 3 it is evident from the analysis of variance Table 3 from the nutritional status index values that the mean

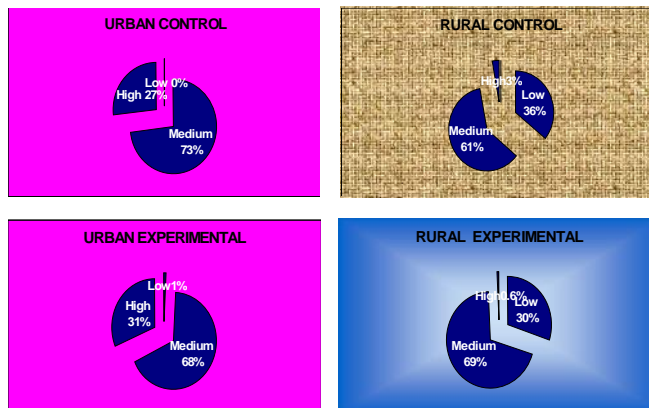


Fig. 1 : Nutritional status index

value of nutritional status index in control group consisting of pre-menopausal women was significantly greater than that of the counter part in rural area and also the experimental group in rural and urban area. The nutritional status index of experimental group of urban area was also significantly greater than the counterpart in rural area. Hence, the urban experimental and control group were found to have significantly greater nutritional status index than the rural experimental and control group. In short, it could be inferred that women in urban area, in general were having greater nutritional status than those in the rural area irrespective of their menopausal status.

This may be attributed to the fact that in general women in the lower income strata are found to have poor nutritional status. Studies conducted among women engaged in stone breaking (Augustine, 1993) and in agriculture related operations (Sujatha, 1990) also gave such indications. However, high level of NSI was observed among employed homemakers of organized sectors (Varghese, 1989) who were invariably in a higher economic strata. The control group consisting of pre-menopausal women had a better intake of nutrients compared to the other groups. Nutritional status index values of pre-menopausal women were clustered around the average index and higher nutritional status index in urban

Table 2 : Comparison of nutritional status index

Category	Value	Rural				Urban			
		Exptl (n=300)	(%)	Control (n=100)	(%)	Exptl (n=300)	(%)	Control (n=100)	(%)
Low	< (Mean-SD) = 7.539	89	29.67	36	36	3	1	0	0
Medium		209	69.67	61	61	203	67.67	73	73
High	> (Mean+SD) = 10.407	2	0.67	3	3	94	31.33	27	27

Table 3 : ANOVA table of nutritional status index

Rural		Urban		F-ratio	Experimental Vs control	C.D.	
Experimental	Control	Experimental	control			Experimental Vs Experimental	Control Vs control
n=300	n=100	n=300	n=100	-	-	-	-
8.05	8.01	9.90	9.93	196.6	0.246	0.174	0.302

area while in rural area the values were more concentrated in low index status and medium index status.

Conclusion :

Menopausal health demands priority in Indian scenario due to increase in life expectancy and growing population of menopausal women. Large efforts are required to educate and make these women aware of menopausal symptoms, reduction of discomfort and enable them to seek appropriate medical care if necessary. It is suggested that more attention be paid on the nutritional status and issues of elderly women and that more longitudinal and interventional studies be conducted in this population.

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