

# Influence of Basic Education and Income on Nutritional Status of Patients Undergoing Hemodialysis: A 6 Month's follow-up study

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**Abstract-**The majority of patients with end stage renal disease (ESRD) have only limited knowledge of their condition. Various studies of the benefits of patient education programs have shown that educated patients have a reduced incidence of emergency dialysis compared with uneducated patients. The risk of end stage renal disease (ESRD) is increased among individuals with low income and in low income communities. Low socioeconomic status has been shown to be associated with an increased risk of end-stage renal disease on dialysis and mortality. This study was performed on 277 patients undergoing hemodialysis at 2 dialysis centers in Nellore (Andhra Pradesh). Data was collected on educational qualification and income through interview method and compared with Subjective Global Assessment. At baseline SGA scores 4.6% illiterates were under well nourished, 54% were in mild to moderate nourishment and 41.2% were in severe malnutrition. After 6 months SGA scores 6.9% were under well nourished, 58.8% were in mild to moderate nourishment and 34.4% were under severe malnourishment. Under the category of degree +Pgat baseline SGA scores 4.3% were under well nourished, 58.6% were mild to moderate nourishment and 36.9% were severe malnutrition. After 6 months SGA scores 13% were under well nourished, 50% were under mild to moderate nourishment, 36.9% were under severe malnutrition. There is significant association in pre and post SGA scores based on income. Neither basic education nor acquired education (knowledge about the disease) did not show any influence on the nutritional status. However income of the family has shown a favorable effect on nutritional status.

**Index terms:** End Stage Renal Disease, Dialysis, Education, Income, Nutritional status, Subjective Global Assessment (SGA)

## INTRODUCTION

The worldwide incidence of chronic renal failure has doubled in the last 15 years, [1] and its progression to end stage disease has been expected to be doubled during next 15 years [2]. Various studies reported that [3] the demand for renal replacement therapy, that is the treatment option for end stage renal disease, increases which in turn become a burden for healthcare services [1];[4]. It is evident from the worldwide data that more than one million end stage renal disease (ESRD) patients

are on renal replacement therapy where as two more million patients are in need of that [5].

In India, it is reported that the progression of chronic kidney disease (CKD) to ESRD is rapid due to the factors such as lack of medical facilities, poor control of risk factors and delayed referral to nephrologists [6]. The prevalence of CKD and ESRD are estimated as 7852 and 1870 per million, respectively [7];[8]. Majority of the patients about 60% will discontinue the therapy within 3 months [6].

It is estimated that in India about 1 00 000 person suffering from ESRD each year, of which only about 20 000 get treated [9]. Over 3/4<sup>th</sup> of the people suffering from ESRD, especially from rural area, are not treated at all. That may be due to the factors such as lack of awareness of the disease and

lack of treatment options; and the affordability is hindered by low income, minor reimbursement for chronic illness and non-availability of insurance [10];[11]. Every year, the patients opting renal replacement therapy increases approximately by 10%. According to the report in 2003, there are almost 80 000 people suffering from severe renal failure and only 650 dialysis centers are available [12]. The risk of end-stage renal disease (ESRD) is increased among low income individuals and in low income communities [13]. Low income or poverty status is one of the most frequently studied indicators of low socioeconomic status (SES) at the individual level [14].

The majority of patients with end stage renal disease (ESRD) have only limited knowledge of their condition. Various studies of the benefits of patient education programs have shown that educated patients have a reduced incidence of emergency dialysis compared with uneducated patients [15]. Educated patients receive better care; enjoy better clinical outcomes [16]. A major problem is early detection of renal failure. The chronic nature of this insidious disease means that the patients usually do not recognize the symptoms until it is too late. This scenario is not specific to any country, but is of even greater concern where there is a lack of dialysis units, access to nephrologists (particularly in rural areas or developing countries) and to patient education [17]. The main objective of the study was to assess whether Education, Income, Marital status influence the dialysis patients Nutritional Status before and after counseling. An attempt was made to compare the effect of diet counseling on Basic education, Acquired education [knowledge about the disease condition, symptoms, and dietary

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modifications], Income and Marital status to improve nutritional status was assessed by Subjective Global Assessment [SGA] method with 6 months follow-up.

**MATERIALS AND METHODS**

This study was conducted in hemodialysis centers at Nellore. All patients undergoing maintenance hemodialysis were included. Written informed consent was obtained from the patients before study participation. A Sample of 300 hemodialysis patients between the age group 20-70yrs participated in the study. Patients were excluded if they were not willing to participate or on whom measurements cannot be taken. In the present investigation subjects of the age group 20-above 70 years undergoing hemodialysis patients were selected.

**24-HOURS DIET RECALL METHOD:**

This method involves a structured interview. A trained interviewer asks child and/or adult to recall all food and drink during previous 24 hours. A 24-hour recall can be administered via paper record or with a computer-assisted program. Prompts for quantification of portion size or use of food models are typically employed.

**SUBJECTIVE GLOBAL ASSESSMENT:**

“Subjective global assessment is a simple bedside method of assessing the risk of malnutrition and identifying those who would benefit from nutritional support. Its validity for this purpose has been demonstrated in a variety of conditions including surgical patients, those with cancer, on renal dialysis and in ICU”.Dr. Khursheed jeejeebhoy

Subjective global assessment or SGA is a proven nutritional assessment tool that has been found to be highly predictive of nutrition- associated

complication. SGA fulfills the requirements of a desirable system of nutritional assessment by SGA-7 scale scores:

Minimum score=7

Maximum score=49

1-14-Well nourished

15-35-Mild to moderate malnourishment and

36-49-Severe malnourishment

**STATISTICAL ANALYSIS:**

Statistical analysis was done chi-square and p- value for Education, Income, Marital status based on SGA scores at baseline and after 6 months.

**RESULTS:**

**Educational qualification-wise distribution of subjects**

At baseline SGA scores 4.6% illiterates were under well nourished, 54% were in mild to moderate nourishment and 41.2% were in severe malnutrition. After 6 months 6.9% were under well nourished, 58.8% were in mild to moderate nourishment and 34.4% were under severe nourishment. Under the category of degree +PgAt baseline SGA 4.3% were under well nourished, 58.6% were mild to moderate nourishment and 36.9% were severe malnutrition. After 6 months SGA 13% were under well nourished, 50% were under mild to moderate nourishment, 36.9% were under severe malnutrition. It indicates educational qualification influence the adoption of nutritional knowledge. But chi-square does not reveal the significant association between pre and post SGA scores (Table-1).

**TABLE 1: Educational qualification-wise distribution of subjects according At baseline and After 6 months SGA scores**

Educational qualification	At Baseline						After 6 months					
	Well nourished (1-14)	Mild to moderate nourishment (15-35)	Severe malnutrition (36-49)	Total	Chi-square	p-value	Well nourished (1-14)	Mild to moderate nourishment (15-35)	Severe malnutrition (36-49)	Total	Chi-square	p-value
Illiterate	6 (4.6%)	71 (54.2%)	54 (41.2%)	131 (100.0%)	8.170	0.612	9 (6.9%)	77 (58.8%)	45 (34.4%)	131 (100.0%)	12.287	0.266
Below 5 <sup>th</sup>	2 (3.9%)	25 (49.0%)	24 (47.1%)	51 (100.0%)			4 (7.8%)	32 (62.7%)	15 (29.4%)	51 (100.0%)		
10 <sup>th</sup>	3 (8.6%)	19 (54.3%)	13 (37.1%)	35 (100.0%)			4 (11.4%)	20 (57.1%)	11 (31.4%)	35 (100.0%)		
Intermediate	0 (0.0%)	12 (85.7%)	2 (14.3%)	14 (100.0%)			0 (0.0%)	11 (78.6%)	3 (21.4%)	14 (100.0%)		
Degree	1 (4.2%)	15 (62.5%)	8 (33.3%)	24 (100.0%)			3 (12.5%)	16 (66.7%)	5 (20.8%)	24 (100.0%)		
PG	1 (4.5%)	12 (54.5%)	9 (40.9%)	22 (100.0%)			3 (13.6%)	7 (31.8%)	12 (54.5%)	22 (100.0%)		
Total	13 (4.7%)	154 (55.6%)	110 (39.7%)	277 (100.0%)			23 (8.3%)	163 (58.8%)	91 (32.9%)	277 (100.0%)		

**Income-wise distribution of subjects**

The subjects were distributed according to their pre and post-SGA scores based on family income per month. The table clearly indicates that above 5000 income group subjects has good improvement in malnutrition status. At baseline SGA scores 5.8% (n=3) were under well nourished, 71.2% (n=37) were under mild to moderate nourishment, 23.1%

(n=12) were under severe malnutrition. Likewise after 6 months SGA scores 15.4% (n=8) were under well-nourished, 69.2% (n=36) were under mild to moderate nourishment, 15.4% (n=8) were under severe malnutrition. The chi-square test has significant association between pre and post SGA scores of income level.

**TABLE 2: Income-wise distribution of subjects according to at baseline and after 6 months SGA scores**

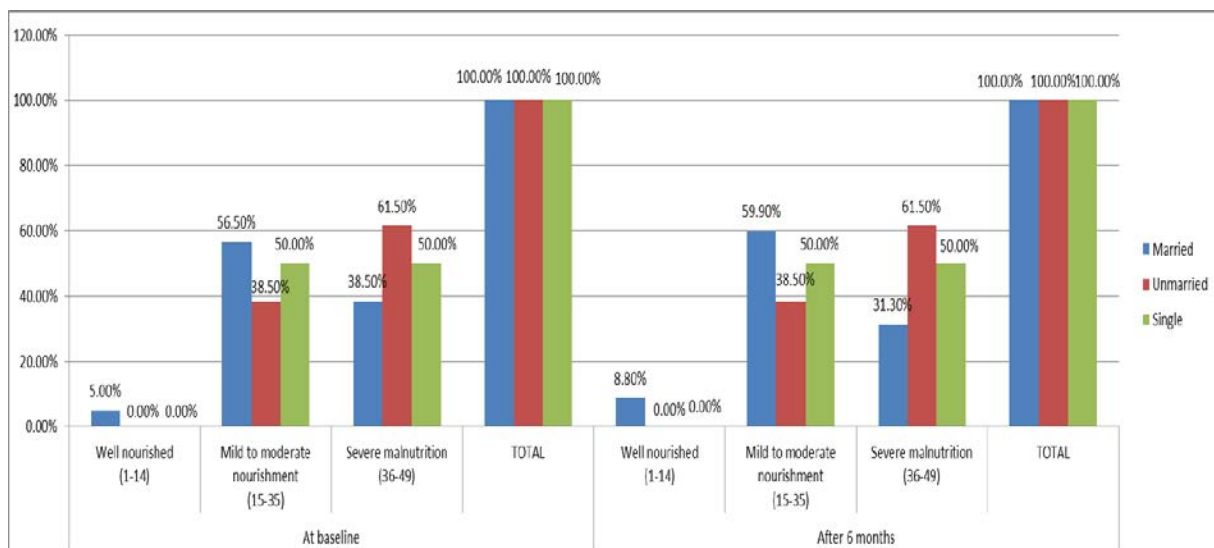
Income of the family per year	At Baseline						After 6 months					
	Well nourished (1-14)	Mild to moderate nourishment (15-35)	Severe malnutrition (36-49)	Total	Chi-square	p-value	Well nourished (1-14)	Mild to moderate nourishment (15-35)	Severe malnutrition (36-49)	Total	Chi-square	p-value
< Rs.3000	10 (5.1%)	101 (51.3%)	86 (43.7%)	197 (100.0%)	8.907*	0.043	14 (7.1%)	113 (57.4%)	70 (35.5%)	197 (100%)	12.465*	0.014
Rs.3000 - Rs.5000	0 (0.0%)	16 (57.1%)	12 (42.9%)	28 (100.0%)			1 (3.6%)	14 (50.0%)	13 (46.4%)	28 (100%)		
> Rs.5000	3 (5.8%)	37 (71.2%)	12 (23.1%)	52 (100.0%)			8 (15.4%)	36 (69.2%)	8 (15.4%)	52 (100%)		
<b>Total</b>	13 (4.7%)	154 (55.6%)	110 (39.7%)	277 (100.0%)			23 (8.3%)	163 (58.8%)	91 (32.9%)	277 (100%)		

**Marital status-Wise distribution of subjects**

The fig-1 clearly indicates that distribution of subjects according to pre and post-SGA scores based on marital status. Table clearly reveals married subjects had good improvement in nutritional status than unmarried and single persons. At baseline SGA 5% (n=13) married were under well nourished, 56.5% (n=148) were under mild to moderate nourishment, 38.5% (n=101) were

under severe malnourished category. After 6 months SGA scores 8.8% (n=23) were under well nourished, 59.9% (n=157) were under mild to moderate nourishment, 31.3% (n=82) were under severe malnutrition. The chi-square test has no significant association between pre and post SGA scores of marital status.

**Figure: 1: Marital status-Wise distribution of subjects according At baseline and after 6 months SGA scores**



**DISCUSSION**

Most of the dialysis units are in the private sector [18] and the average hemodialysis cost anywhere in India range between Rs. 1200 and Rs. 2000 per

session. When calculating the cost of hemodialysis in private hospitals, it comes around Rs. 12 000 per month and 1 40 000 per year [18]. In addition to this they have to pay for erythropoietin, lab test, consultation fee, etc. This becomes a nightmare for the common Indian people who cannot afford the expense. Many of them purposefully quit the sessions and their condition worsens terribly. The results also indicated that above 5000 income group subjects has good improvement in malnutrition status. Pre-SGA 5.8% (n=3) under well nourished, 71.2% (n=37) under mild to moderate nourishment, 23.1% (n=12) under severe malnutrition. In post SGA 15.4% (n=8) under well-nourished, 69.2% (n=36) under mild to moderate nourishment, 15.4% (n=8) under severe malnutrition.

In India the number of death due to ESRD was 3.78 million in 1990 (40.4% of all death) and is expected to increase up to 7.73 million in 2020 (66.7% of all death) [19]. Due to delayed diagnosis and failure to take suitable measures to prevent the progression of renal failure may result in end stage renal disease at young stage itself [20];[21].

People on dialysis must be shown that they can control certain aspects of their lives and health, and that they indeed have the potential to live long and productive lives through engaged incoordinated program of medical treatment, education, exercise, counseling and diet management [22]. Not only the fact that ESRD complications, such as anemia, hyperlipidemia, nutritional limitations, renal osteodystrophy and cardiovascular disorders [23]. However, some authors believe Health Related Quality of Life of dialysis patients is affected by age [21], gender [25]-[28], level of education [29], marital status [30], and income [31]. In this study married subjects had good improvement in nutritional status than unmarried and single persons. In pre SGA married 5% (n=13) were under well nourished, 56.5% (n=148) were under mild to moderate nourishment, 38.5% (n=101) were under severe malnourished category. In post SGA 8.8% (n=23) were under well nourished, 59.9% (n=157) under mild to moderate nourishment, 31.3% (n=82) under severe malnutrition. In opposition, others showed that these factors had no impact on Health Related Quality of Life [29];[31];[32].

Educational level was inversely related to the incidence of malnutrition. In this study under the category of degree +Pg in pre SGA 4.3% were under well nourished, 58.6% were mild to moderate nourishment and 36.9% were severe malnutrition. In post SGA 13% were under well nourished, 50% were under mild to moderate nourishment, 36.9% were under severe malnutrition. It indicates educational qualification influence the adoption of nutritional knowledge. Increased education can upgrade nutrition knowledge, increase household income and thus increase the food purchasing power and finally increase the nutritional status. Education level,

effects on employment, occupation and income level and general household economic-social conditions [33].

Regular assessment of nutritional status in HDP is important for early detection of malnutrition and thus improving this condition. Correcting PEW undergoing hemodialysis requires nutritional support with adequate amounts of protein. Regarding dietary protein intake for dialysis patients, the American dietetic Association guidelines, suggested daily protein intake of 1.2 g/kg/day. 50% of total daily protein should be of high biological value [34].

The SGA has been found to be reliable and valid for assessing PEW [35]. A single SGA assessment has been shown to be associated with morbidity, hospitalization and mortality in several clinical studies [35]. Therefore, since 2000 the National Kidney Foundation Kidney Disease/Dialysis outcomes and quality initiative (K/DOQI) has recommended the use of the SGA for assessing the nutritional status of dialysis patients [36].

## CONCLUSION:

Neither basic education nor acquired education (knowledge about the disease), Marital status did not show any influence on the nutritional status. However income of the family has shown a favorable effect on nutritional status.

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