

Nutrition Related Knowledge, Awareness and Attitude of Geriatric Patients - A Pilot Study

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ABSTRACT

Nutrition knowledge may influence dietary behavior directly or through nutrition related attitudes. Dietary behaviors further become dietary patterns and influence one's nutrient intake. Therefore, understanding people's nutrition knowledge, attitudes, and behavior is the basis for nutrition education. The aim of this study was to evaluate nutrition related knowledge and attitude amongst elderly people visiting Rural Dental College & Hospital, Loni, Maharashtra. An observational study was conducted to evaluate change in nutrition related knowledge (NRK) and nutrition related attitude (NRA) pre and post nutrition education. A general nutrition knowledge questionnaire was formulated based on ICMR guidelines for nutrition in elderly and Nutrition awareness was assessed using a self-formulated questionnaire based on choice of everyday foods. Statistical analysis was performed using Statistical Package for Social Science (SPSS) version 21 for Windows (Armonk, NY: IBM corp). Significant difference was observed in NRK and NRA of geriatric patients pre and post nutrition education. Higher NRK and more positive NRA's were associated with higher level of education, younger age, and philosophical mental attitude. Nutrition education revealed positive impact on NRK and NRA's indicating the need for educational intervention and periodic reinforcement of nutrition knowledge as a means of lifestyle modification and health status improvement.

Keywords

Attitude and awareness, Dietary practices, Geriatric nutrition, Lifestyle modification, Nutrition education, Nutrition knowledge

Introduction

Diet and Nutrition are vital for health and wellbeing of aging population. Over the last decade, role of nutritional status in a number of morbid conditions such as cancer, heart disease, and dementia in people over the age of sixty-five has been increasingly recognized. Failure to consider real nutritional needs and failure to identify patients with low nutritional intake may result in a lack of focus on nutritional care in older patients. Some nutritional disorders, such as undernutrition, overnutrition and obesity, as well as vitamin and mineral deficiencies (absolute or relative) are more prevalent amongst elderly population¹. Although there is no universally accepted criterion for malnutrition in the elderly, involuntary weight loss, an irregular body mass index (BMI), specific vitamin deficiencies, and reduced dietary intake are non-specific indicators². According to various studies in India, more than half of the elderly population is malnourished, and more than 90% consume less than the recommended quantity of food³. Malnutrition among elderly often remains underdiagnosed⁴. In the vulnerable elderly patients, functional, psychological, social, and economic issues associated with concomitant medical problems may all contribute to poor nutrition and weight loss⁵. According a special report published by National Nutrition Beareu, in males, the overall intake of multiple foods, with the exception of cereals and millets and all nutrients except calcium, thiamin, and vitamin C had lower average intakes than the RDA⁶. Illiteracy among older adults is another major concern as illiterate people are more vulnerable to illness⁷. Many older adults have low levels of health literacy which affects their ability to participate optimally in healthcare⁸.

Knowledge may be defined as awareness or familiarity gained by experience (of a person, fact, or thing)⁹. Nutrition related knowledge/knowledge of what should be consumed, as well as understanding of the value of

good eating habits, are the first steps toward improving eating habits. Thus, the aim of nutrition education is to instill sufficient knowledge of a 'healthy diet'.

When approaching the nutritional issues of the elderly, it is important to consider their possible limitations; the elderly may not only have less desire to learn new things and lower studying capacity, but they may also be somewhat restrictive in their behaviors, both of which factors may render diet strategies less successful¹⁰. Inability to chew and reduced palatability of foods often lead to an unwillingness to eat further resulting in nutrient deficiency¹¹. Nutrition related attitude of patients has a significant impact on the dietary restrictive behavior and is an important indicator of how motivated one is to bring about changes in their eating patterns. Other factors that have been found to adversely affect motivation to eat and thus be possible causes of malnutrition in the elderly population include: i) psychological factors such as depression, leaving one's normal environment (e.g., moving into a nursing home), loss of family / friends, ii) physiological factors, such as the inability to prepare food, reliance on caregivers, impaired physiologic functions (sensory abilities limitations), and iii) pathological reasons, such as drug interactions/illness¹². Given these complex contributing factors, a thorough nutritional evaluation is required for both the accurate diagnosis of elderly malnutrition and the development of adequate and comprehensive treatment plans¹³. One of the primary responsibilities of all healthcare professionals is to provide nutritional guidance to elderly patients. Malnutrition can result from inadequate nutrition, which can have significant implications for a person's quality of life. As primary caregivers, healthcare workers are ideally positioned to ascertain the elder's nutritional status and to ensure appropriate measures are taken to optimize nutritional intake for each individual¹⁴. Dietary habits evolve into dietary patterns, which have an effect on overall nutrient intake. As a result, nutrition education begins with an appreciation of people's nutrition awareness, attitudes, and actions. Thus, the purpose of this study was to evaluate nutrition related knowledge and attitude amongst elderly people visiting Rural Dental College & Hospital, Loni, Maharashtra.

Methodology

A questionnaire-based pilot study was conducted on geriatric patients visiting the Dept. of Prosthodontics, Rural dental hospital, Loni.

A detailed questionnaire regarding nutrition related knowledge was formulated to assess knowledge, awareness and attitudes of geriatric patients. This study was conducted in 2 phases - Phase 1 /Pretest- NRK and NRA assessed followed by a short nutritional education session. Phase 2/Posttest-The same questionnaires were repeated to evaluate change in knowledge, awareness and attitude post educational intervention. The relation between both was evaluated using appropriate statistical tools. Dental status assessment done by observation.

Nutrition knowledge and awareness questionnaire: A general nutrition knowledge questionnaire was formulated based on ICMR guidelines for nutrition in elderly consisting of 20 questions, 5 questions from 4 domains each namely- Dietary recommendations, nutrient sources, choice of foods, diet disease link.

Nutrition attitude questionnaire:

NRAs were assessed by seven questions, related to everyday diet and food choices on a five-point Likert scale, range = 1–5. Response options ranged from “strongly disagree” to “strongly agree”

Scoring Criterion-

Nutrition Related Knowledge (NRK):

True = 1 point

False=0

Minimum score=0

Maximum score=20

Nutrition Related Awareness (NRA):

5point lickert scale

Response options ranged from “strongly disagree” to “strongly agree”

Strongly disagree Disagree No response Agree Strongly agree

Minimum=7

Maximum=35

Permission to publish and ethical approval for the present research was obtained from the Institutional Research cell.

Sample

For the purpose of this study Inclusion criterion considered all geriatric patients visiting Dept of Prosthodontics, Rural Dental Hospital, Loni who were willing to participate in the study and give consent, whereas patients not willing to participate in study and Mentally unstable patients were excluded from the study.

Data Analysis

Statistical analysis was performed using Statistical Package for Social Science (SPSS) version 21 for Windows (Armonk, NY: IBM Corp.) Confidence interval set at 95% and probability of alpha error (level of significance) set at 5%. Power of the study set at 80%.

Comparisons of nutrition related knowledge and attitude before and after education programme was compared using paired ‘t’ test.

Comparisons of nutrition related knowledge and attitude in different age groups and educational groups was done using Anova ‘F’ test.

Comparison of frequency distribution of study subjects in different scores group was performed using Chi square test.

Results

All values were noted, analyzed and inserted in proforma of table (table 1-7) below.

Table 1: Comparison of nutrition related knowledge before and after intervention respectively using paired t test

	BEFORE NUTRITI ON EDUCA- TION MEAN (SD)	AFTER NUTRITI ON EDUCA- TION MEAN (SD)	Paired t test	p value, Significan ce
Nutrition related Knowle- dge	14.43 (3.42)	19.4 (1.4)	t = -7.356	p < 0.001**

p<0.05 – significant difference; p<0.001 – highly significant difference/change

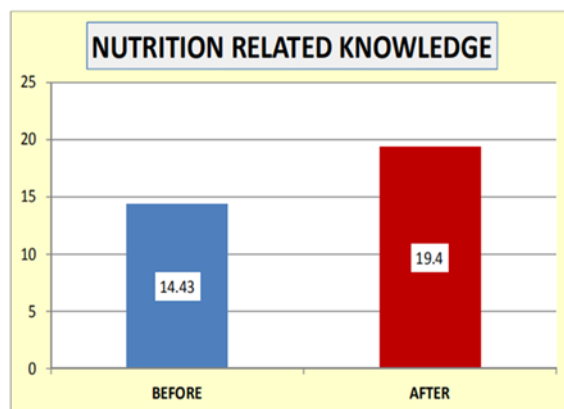


Table 2: Comparison of nutrition related attitude before and after intervention respectively using paired t test

	BEFORE NUTRIT- ION EDUCAT- ION MEAN (SD)	AFTER NUTRIT- ION EDUCAT- ION MEAN (SD)	Paired t test	p value, Significanc e
Nutrition related Attitude	28.6 (3.65)	33.86 (2.38)	t = -6.608	p < 0.001**

p<0.05 – significant difference;p<0.001 – highly significant difference/change

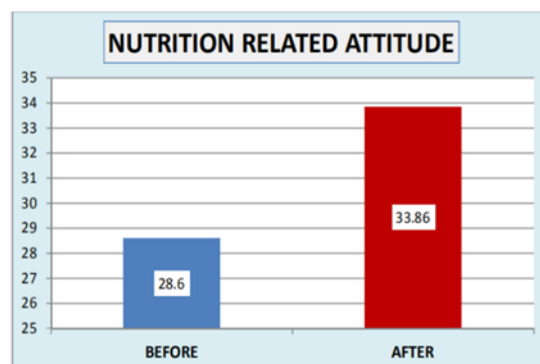


Table 3: Comparison of nutrition related knowledge in different age groups in study population

	KNOWLEDGE BEFORE NUTRITION EDUCATION MEAN (SD)	KNOWLEDGE AFTER NUTRITION EDUCATION MEAN (SD)	CHANGE IN KNOWLEDGE AFTER EDUCATION MEAN (SD)
50 – 60 years(n=9)	14.4 (3.84)	19.44 (4.38)	5.04 (1.93)
61- 70 years(n=15)	14.13 (2.95)	19.66 (5.05)	5.53 (2.06)
71-80 years(n = 5)	14.6 (3.42)	18.4 (4.59)	3.8 (1.65)
81 – 90 years(n =1)	18 (5.98)	20 (5.36)	2 (0.94)
ANOVA F TEST value	F = 8.76	F =15.92	F = 18.54
p value, Significance	p =0.067	p =0.039*	p =0.005*

p<0.05 – significant difference;p<0.001 – highly significant difference

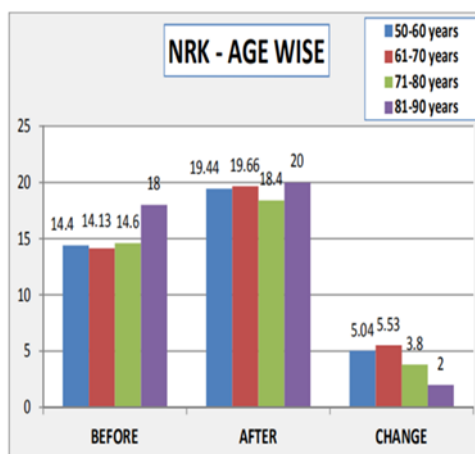


Table 4: Comparison of nutrition related attitude in different age groups in study population

	ATTITUDE BEFORE NUTRITION EDUCATION MEAN (SD)	ATTITUDE AFTER NUTRITION EDUCATION MEAN (SD)	CHANGE IN ATTITUDE AFTER EDUCATION MEAN (SD)
50 – 60 years(n=9)	28.66 (2.48)	34.77 (5.02)	6.11 (1.05)
61- 70 years(n=15)	28.67 (2.96)	33.8 (4.67)	5.13 (1.46)
71-80 years(n = 5)	27.8 (3.37)	32.2 (3.71)	4.4 (0.97)
81 – 90 years(n =1)	31 (4.51)	35 (4.06)	4 (0.88)
ANOVA F TEST value	F = 4.13	F = 7.09	F = 11.06
p value, Significance	p = 0.579	p =0.048*	p =0.034*

p<0.05 – significant difference;p<0.001 – highly significant difference

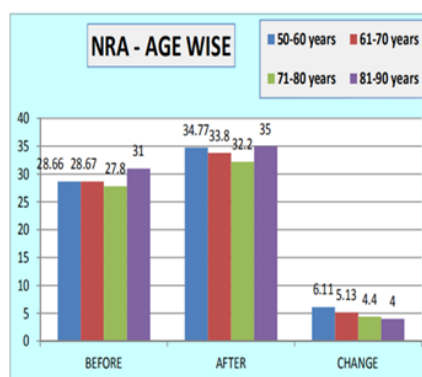


Table 5 : Comparison of frequency of nutrition related knowledge & attitude in different age groups in study population

	KNOWLEDGE BEFORE NUTRITION EDUCATION	KNOWLEDGE AFTER NUTRITION EDUCATION	ATTITUDE BEFORE NUTRITION EDUCATION	ATTITUDE AFTER NUTRITION EDUCATION
0-5 years	0 (0%)	0 (0%)	0 (0%)	0 (0%)
6-10 years	6 (20%)	0 (0%)	0 (0%)	0 (0%)
11-15 years	9 (30%)	1 (3.33%)	14 (46.66%)	1 (3.33%)
16-20 years	15 (50%)	29 (99.67%)	16 (53.34%)	29 (99.67%)
Chi square test	Chi = 17.63		Chi =18.04	
p value, Significance	p = 0.002*		p <0.001**	

p<0.05 – significant difference;p<0.001 – highly significant difference

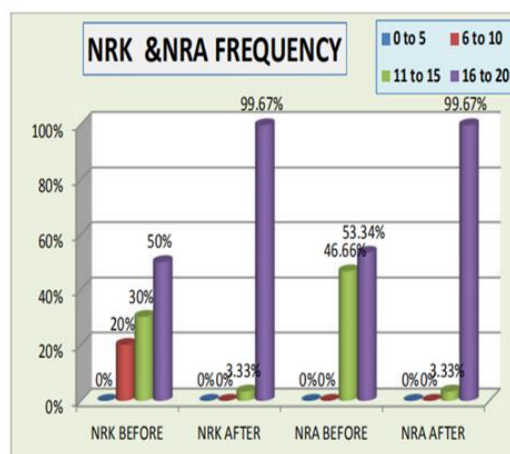


Table 6: Comparison of nutrition related knowledge in different education levels group type in study population

	KNOWLEDGE BEFORE NUTRITION EDUCATION MEAN (SD)	KNOWLEDGE AFTER NUTRITION EDUCATION MEAN (SD)	CHANGE IN KNOWLEDGE AFTER EDUCATION MEAN (SD)
Uneducated	11 (2.1)	17.5 (3.28)	6.5 (1.7)
Primary	14.2 (3.8)	17.5 (2.83)	3.3 (0.7)
Higher Secondary	15.6 (2.19)	19.8 (24.48)	4.2 (1.3)
Graduate	14 (1.38)	19.5 (1.21)	5.5 (1.96)
Post graduate	16 (2.07)	20 (4.96)	4 (1.3)
ANOVA F TEST value	F = 4.07	F = 13.95	F = 27.03
p value, Significance	p = 0.086	p = 0.001**	P < 0.001**

p<0.05 – significant difference; p<0.001 – highly significant difference

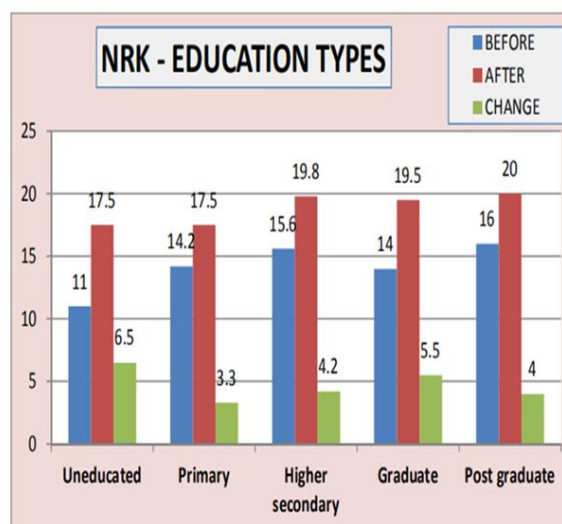
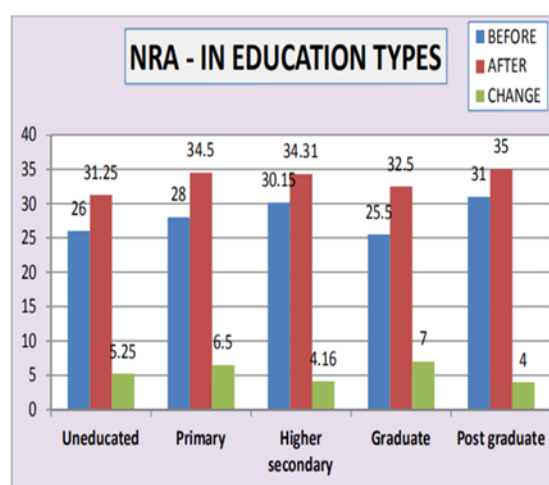


Table 7: Comparison of nutrition related attitude in different educational levels groups in study population

	ATTITUDE BEFORE NUTRITION EDUCATION MEAN (SD)	ATTITUDE AFTER NUTRITION EDUCATION MEAN (SD)	CHANGE IN ATTITUDE AFTER EDUCATION MEAN (SD)
Uneducated	26 (1.06)	31.25 (3.47)	5.25 (2.37)
Primary	28 (1.47)	34.5 (2.46)	6.5 (3.61)
Higher secondary	30.15 (1.92)	34.31 (5.72)	4.16 (2.58)
Graduate	25.5 (1.43)	32.5 (4.08)	7 (3.36)
Post graduate	F = 2.94	F = 9.02	F = 14.93
p value, Significance	p = 0.693	p = 0.068	p = 0.045*

p<0.05 – significant difference;p<0.001 – highly significant difference



Discussions

The study examined whether NRK and NRAs are associated with socio-demographic determinants, education and edentulous state among participants. Significant difference was observed in Nutrition related Knowledge and awareness of geriatric patients pre and post nutrition education. In present study 30 % of participants were between 50-60 years of age, 50% between 60-70 years of age ,16 % between 70-80 years of age.

In India, there are approximately 56 million elderly people (6.7 percent)⁸ and in coming years the percentage is expected to rise . Study by Kushwaha S et al¹⁵ indicates malnutrition and the risk of malnutrition is present in 18.29 percent and 48.17 percent of the elderly, respectively. An improvement in health status of elderly has been observed following educational programmes which includenutrition advice¹⁶.The results of this study are similar to results of Kim et al¹⁰who concluded that after nutritional education program, change in subjective dietary behaviors and self-rated perceptions of health improved significantly and dietary behavior scores also improved significantly, while nutritional risk levels decreased. Also, a research by Uemura et al¹⁷ indicated

that health education through active learning enhances dietary variety any many other parameters in older adults. The results of Umbrella Review by Poscia A et al¹⁸ show that a variety of supplements, as well as environmental and organizational interventions, can help the elderly enhance a variety of anthropometric, nutritional, and functional indices. However, as mentioned by Schultz T et al¹⁹ when compared to single interventions, multiple interventions are more successful in achieving long term clinically significant achievements in body composition. Programs that successfully involve seniors in participation and alter behavior as a direct result of participation provide compelling evidence that health changes and lower health-care costs are achievable²⁰. The present study results indicate 50 % of individuals scored higher in pretest for nutrition related knowledge whereas in post-test 96.66 % of individuals scored higher indicating positive impact of nutrition education in all patients. Nutrition related attitude scores also indicated a positive shift in mental attitude of patients in relation to nutrition education [pretest 53.33 % of patients scored higher; in posttest 96.66 % of individuals scored higher]. Chernoff R et al²¹ concluded changes in behavior were linked to a perception that eating a healthy diet will improve one's health. The use of a variety of adult education ideas and models can help to promote behavior changes that contribute to healthier behaviors and allow a health educator to be effective in changing people's mindset.

Results of study conducted by Askari et al²² revealed that the mean scores of knowledge, attitudes, subjective norms, and enabling factors in two experimental and control groups after intervention were a significant difference as after training program, nutritional and jogging performance in the experimental group was better than the control group. Similarly, in present study significant statistical difference ($p < 0.05$) was observed among different age groups in relation to mean nutrition related knowledge, awareness and attitude post education and also in respect to change in change in scores pre to post with respect to education module.

Health education has long been regarded as a tool for achieving health literacy¹⁷. The connection between what people know and what they do, has been described as "very poor." Given that information rarely anticipates a behavioral shift, knowledge serves as a valuable tool when people decide to change²³. A health promotion program for the elderly should include strategies for inspiring them to start living a healthier lifestyle and then sustain long-term changes in dietary behavior-related health²⁴. With respect to education module, significant differences were observed. Uneducated participants (13.33 %) in the study demonstrated lowest scores while educated participants scored comparatively higher. Highest score was achieved by highest educated participant indicating proportionate relation between nutrition knowledge, awareness attitude and education level. The results of a study by Coelho-Júnior HJ et al²⁵ indicated that the participants were both interested in and in need of nutrition counselling; 36% needed more information on a healthy diet. Hence in geriatric recovery services, nutrition therapy should play a significant role. Recreation centres can effectively incorporate both informal and formal health promotion programs for senior citizens²⁶. Patel P et al²⁷ validated a potentially valuable nutritional literacy tool that could be used to recognize people with low levels of education and understanding about their eating habits. Nutritional assessment should also include complete systematic evaluation of inflammation, protein intake, and vitamin D status²⁸. Despite extensive research and current software applications, food recommender systems continue to face numerous challenges in terms of monitoring nutrition habits and providing appropriate recommendations of texture modified foods²⁹. Additionally, the users often find it difficult and time consuming to enter manually their food every day in the system. Dietary guidelines are

primarily aimed at reducing the prevalence of malnutrition in population, rather than taking individual nutritional needs into account. Apart from nutritional recommender systems, there is also a need to use behavior change strategies to change the eating habits of the elderly.

Dental status did not reveal any significant difference in test scores among participants in our study unlike the results of study by Watson et al³⁰ who concluded that impaired dental status appears to influence food selection, and intake of important nutrients. One possible explanation could be psychological impact of edentulous state (partial/complete) on increasing awareness, knowledge and attitude of the patients. The findings of Natapov L et al³¹ illustrate the value of ensuring good oral hygiene, preserving natural teeth, and attending the dentist on a regular basis for the elderly in order to ensure sufficient nutritional status. A study conducted by Su Y et al³² suggests that using partial dentures to replace the lost teeth to meet the dietary needs of the elderly is critical to maintaining a healthy nutritional status. Moreover, it also indicates the importance of providing education to older adults who wear complete dentures. To recognize older men who are nutritionally vulnerable, health practitioners must conduct routine nutritional tests. Geriatric assessment is a multifaceted, multidisciplinary evaluation of an older person's functional ability, physical health, cognition and mental health, and socio-environmental conditions. Most geriatric assessments are less detailed and more problem-focused as a result of the demands of a busy clinical practice. Successive nutrition education and re-evaluation will prevent decline in health status³³. Since problems differ depending on the patient and the dental situation, suggestions must be adapted to the patient's needs³⁴. Caregivers should screen the nutritional status of elderly patients and provide diet related guidance as per changes in eating ability³⁵.

Almost all participants (96.66 %) interviewed had a philosophical mental attitude (as per mental attitude classification by MM HOUSE)³⁶.

Conclusion

- 1.Higher NRK and more positive NRAs was associated with higher level of education, occupation, younger age, dental status and mental attitude.
 - 2.Nutrition education had a positive impact on NRK's and NRA's indicating the need for educational intervention and periodic reinforcement of nutrition knowledge as a means of lifestyle modification and health status improvement. Additional nutrition programs dedicated to older adults should be formulated and implemented in order to improve their NRK (and NRAs) which in turn may improve their eating habits and overall health.
- Having a good nutrition-related knowledge and attitude strongly and positively impacts the health status and quality of life of elderly population.

Limitations and Future Studies

Despite various promising results, this study had certain limitations. Firstly, owing to the fact that it was pilot study, the number of individuals interviewed were much less to arrive at a generalized conclusion. Secondly, less number of parameters were evaluated. The value of this study would have increased if more invasive and system specific parameters would be evaluated such as blood chemistry, hormonal profile etc. Lastly, the evaluation was done immediate post education module which lead to promising results. The same evaluation could be repeated atleast once at a three or six month duration to evaluate the actual change in knowledge and attitudes towards healthy eating and also effectiveness of education module on dietary modification. Long term and more

invasive studies are required to understand the effect of counselling on improvement of overall health status of geriatric population.

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Abbreviations:

ICMR = Indian Council of Medical Research
 NRK= Nutrition Related Knowledge
 NRA= Nutrition Related Attitude
 NIN = National Institute of Nutrition
 RDA=Recommended Dietary Allowance