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Effect of dietary counselling and nutrition education on food intake among adolescent girls belonging to different socio-economic backgrounds, Bihar

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Abstract

Background: Adolescence period is described as “neither children nor adult” or as “growing-up years”. After infancy, adolescence period is the second fastest growth period. It is the period where transformation occurs from childhood to adulthood with extent biochemical, emotional, cognitive, physical and social development.

Methods: The study was carried out on 15-19 years age group of adolescent girls. The total number of adolescent girls was 100 and they were classified into three different groups’ i.e. upper class, middle class and lower class. The information related to dietary intake, food habit and knowledge about the food was obtained through interview schedules and food consumption of the subjects was assessed using a 3 days 24-hour recall method. Nutrition education packages were delivered with the help of various education methods namely lectures, storytelling, drama and videos.

Results: It was shown that as income increased the intake of all food stuffs also increased. It was observed that after nutrition intervention and dietary counselling, intake of all food stuffs and nutrients was slightly increased by respondents of each socio-economic group. Positive changes were shown in every income group of girls.

Keywords: Adolescent girls, food intake, socio-economic group, dietary counselling, nutrition education

Introduction

Adolescence is one of the complex periods and this age group needs special care and attention because it is the time when the body requires more nutrients. We can say that adolescence is the most important period of the life cycle which gives a second chance to the children to improve their health and also catch up their growth who had poor nutritional status in early life (Das *et al.* 2021) [2].

The adolescent population in India (243 million) is the highest in the world followed closely by China (207 million) (Dave *et al.* 2017) [3]. Adolescents are estimated over 21.4 per cent of the Indian population (Nair *et al.* 2017) [12]. Worldwide, it is expected that the number of adolescents will reach 1.13 billion by 2025 (Hussain *et al.* 2015) [7].

The World Health Organisation believes nutritional status is a prime indicator and also key elements for support of the growth and development of adolescents. Nutritional status of adolescents of developing countries like India is poorer as compared to developed countries (Fatima *et al.* 2019) [4]. There are various factors which affect adolescent’s health and nutritional status directly or indirectly such as inadequate nutrition, lack of awareness about health and nutrition, early marriage, high migration rate etc. Poor socioeconomic status and low literacy levels are one of the major factors which lead to under nutrition in adolescent girls (Getachew *et al.* 2019) [6]. In India, the prevalence of under nutrition among school going girls is high, especially among tribal communities and rural areas (Filipe *et al.* 2013) [5]. Freedom from poor health and nutritional status is a basic human right for every individual. Proper knowledge of health related issue and also dietary pattern could be a significant step towards breaking the vicious cycle of intergeneration under nutrition, obesity, anaemia and also various chronic diseases of adolescent girls. Poor socio economic status and low literacy level is a significant aspect that often leads to under nutrition in adolescent girls (Getachew *et al.* 2019) [6].

Materials and Methods

Bihar is the third largest state of India. As per the 2011 census, total population of Bihar is around 104,099,452 (49,821,295 female and 54,278,157 male). Population belonging to rural and urban areas are 89 per cent and 11.3 per cent respectively. Hence, Bihar was chosen purposively for the study.

The study was carried out on 15-19 years age group of adolescent girls. The total number of adolescent girls was 100 and they were classified into three different groups i.e. upper class, middle class and lower class by the use of Kuppaswami socioeconomic status (SES) scale Performa modernized by Kumar *et al.* (2013). Out of total 100 respondents, 78 respondents from lower class families, 14 respondents from middle class families and 8 respondents from upper class families were selected for this present study.

Kuppaswami socioeconomic status was originally proposed in 1976. Socio economic scale is based on the three items- family income, education and occupation of head of the family's. Information of these items was collected using SES scale (Kumar *et al.* 2013).

Education: Education refers to the individual's ability to read and write. Education level of head of the family was categorized below:

1. Professional or honors.
2. Graduate or post graduate.
3. Intermediate/post high school diploma.
4. High school certificate.
5. Middle school certificate.
6. Primary school certificate.
7. Illiterate.

Occupational status: The term occupation is defined as the work or services from where the family gets some kind of benefits like money to fulfil their daily needs.

Income

The term family income assigns to the gross income of the family earned by all members and which is available for their expenditure.

The information related to dietary intake, food habit and knowledge about the food was obtained through interview schedules and food consumption of the subjects was assessed using a 3 days 24-hours recall method.

Selected respondents were interviewed based on whether different foods were consumed daily, on every other day, weekly basis, rarely or not consuming. Respondents were asked to convey their preference of frequency in food consumption from various food groups.

Nutrition education package were delivered with the help of various education methods namely lectures, storytelling, drama and videos. In this study, individualized dietary counselling was conducted for the selected adolescent girls.

Respondents were asked about dietary habits and nutrition related various questions. After delivering of nutrition lectures and dietary counselling, it was observed that the selected respondents developed proper knowledge of good dietary and health practices. To assess the impact of nutrition knowledge of adolescent girls, pre and post-test were conducted and respondents obtained "yes" or "no" categories. The scoring of each component was done on two points i.e. whether correct or incorrect. Right response was allocated with a score i.e. one while wrong response was given score zero. Total score obtained of each selected subject was summed up for each aspect separately.

In present study t test, mean and standard deviation was used to compare the mean food intake of different socio-economic group and also to find significant difference among all group of adolescent girls. The pre and post-exposure of the difference in knowledge gain of the respondents was also analyzed through t-test.

Results and Discussion

Data on effect of nutrition intervention and dietary counselling on food intake of selected adolescent girls from different socio-economic group is presented in Table 1, 2 and 3.

The data depicted in (Table 1) found that before nutrition education, the daily intake of cereals and pulses by lower class girls was 208.6 and 18.41 g/day (69.53 and 30.68% of RDI). After imparting education and counselling, consumption of cereals and pulses by adolescents was slightly increased and the mean daily intake was 210.43 and 20.41 g/day (70.14 and 34.02% of RDI).

Daily consumption of green leafy vegetables, roots and tubers and other vegetables of girls of lower income group was 27.82, 32.65 and 30.12 g/day and these increased to 30.28, 34.69 and 32.35 g/day after nutrition education and counselling.

Consumption of fruits by respondents of lower class group was very less, before imparting knowledge regarding health and nutrition, the mean intake of fruits was 19.47 g/day which increased to 20.60 g/day and daily intake of milk and milk product was 186.46 g/day (37.29 per cent of RDI) and it increased to 195.34 g/day (39.07% of RDI) after counselling and nutrition education.

It was found that before counselling, the daily consumption of fats and oils by lower class girls were more as compared to RDI and the average intake was 26.25 g/day (105% of RDI) and it decreased to 23.34 g/day (93.36% of RDI) after nutritional education.

Table 1: Effect of nutrition education and dietary counselling on mean food intake of respondents belonging to lower class family

Lower class n=78					
Food groups	RDI (gm) #	Pre-test (gm)	Post-test (gm)	% change	t-value
Cereals	300	208.6±38.48 (69.53)	210.43±33.71 (70.14)	+0.61	0.31 ^(NS)
Pulses	60	18.41±4.28 (30.68)	20.41±4.28 (34.02)	+3.34	2.91 ^(*)
GLV	100	27.82±5.4 (27.82)	30.28±6.06 (30.28)	+2.46	2.67 ^(*)
Roots & tubers	100	32.65±6.06 (32.65)	34.69±6.09 (34.69)	+2.04	2.09 ^(*)
Other vegetables	100	30.12±11.91 (30.12)	32.35±11.35 (32.35)	+2.23	1.19 ^(NS)
Fruits	100	19.47±5.81 (19.47)	20.6±5.85 (20.60)	+1.13	1.2 ^(NS)
Milk & milk products	500	186.46±114.67 (37.29)	195.34±112.73 (39.07)	+1.78	0.48 ^(NS)
Fats & oils	25	26.25±9.97 (105)	23.34±6.34 (93.36)	-11.64	2.17 ^(*)

- Values are mean ± SD.
- RDI= Recommended Dietary Intake (ICMR 2010) [8].
- n-indicates the number of respondents.
- Figures in parentheses indicate per cent of RDI.
- t-values indicated comparison of pre and post scores.
- Significant at 5%.
- NS-Non Significant.

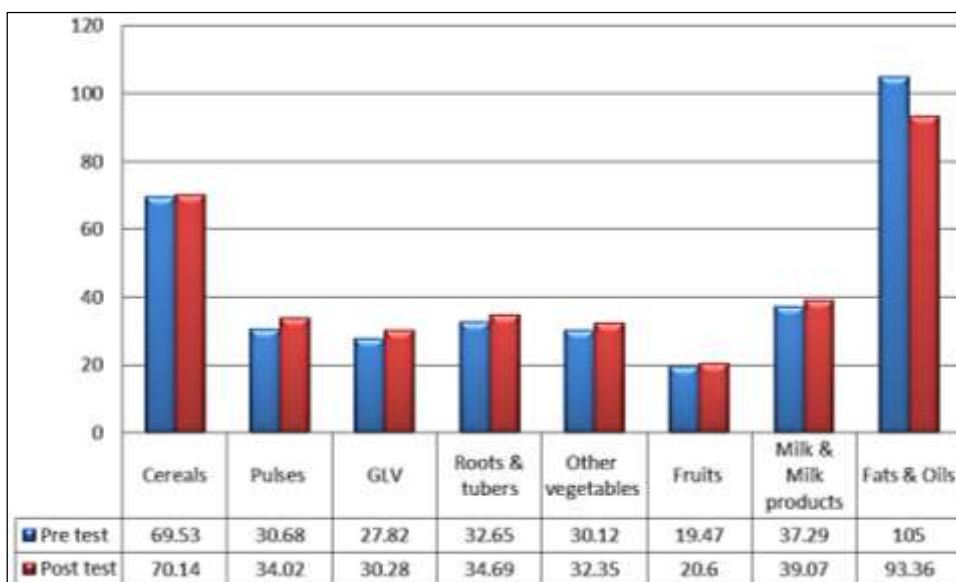


Fig 1: Comparison between pre and post-test of daily food intake (% RDI) of lower class respondents (15-19 years)

Data in (Table 2) showed that before nutrition education, the average daily intake of cereals and pulses of adolescent girls of middle-income group was 222.07 and 22.71 g/day (74.02 and 37.85% of RDI). After imparting education and counselling, consumption of cereals and pulses by adolescents was slightly increased and the mean daily intake was 239.03 and 32.07 g/day (79.68 and 53.45% of RDI).

Daily mean intake of green leafy vegetables, roots and tubers and other vegetables of girls of middle class group was 34.78, 38 and 43.07 g/day (34.78, 38 and 43.07% of RDI) and it increased to 41.5, 43.14 and 47.92 g/day (41.5, 43.14 and 47.92% of RDI) after nutrition education and counselling.

Before imparting knowledge, the Consumption of fruits by respondents of middle class family was 23.28 g/day which increased to 31.57 g/day and intake of milk and milk product was 221.42 g/day (44.28% of RDI) and it increased to 240.78 g/day (48.16% of RDI) after counselling and nutrition intervention.

It was found that before counselling, the daily intake of fats and oils by middle class girls was more as compared to RDI (25 g). The consumption of fats and oils was 32.64 g/day (130.56% of RDI) and after one month of nutrition related training, it declined to 24.07 g/day (96.28% of RDI).

Table 2: Effect of nutrition education and dietary counselling on mean food intake of respondents belonging to middle class family

Middle class n=14					
Food groups	RDI (gm)	Pre-test (gm)	Post-test (gm)	% change	t-value
Cereals	300	222.07±42.67 (74.02)	239.03±39.08 (79.68)	+5.66	1.09 ^(NS)
Pulses	60	22.71±9.61 (37.85)	32.07±7.54 (53.45)	+15.6	2.86 ^(*)
GLV	100	34.78±18.06 (34.78)	41.5±14.38 (41.5)	+6.72	1.08 ^(NS)
Roots & tubers	100	38±12.99 (38)	43.14±12.26 (43.14)	+5.14	1.07 ^(NS)
Other vegetables	100	43.07±26.75 (43.07)	47.92±26.54 (47.92)	+4.85	0.48 ^(NS)
Fruits	100	23.28±15.14 (23.28)	31.57±17.11 (31.57)	+8.29	1.35 ^(NS)
Milk & milk products	500	221.42±154.13 (44.28)	240.78±128.38 (48.16)	+3.88	0.36 ^(NS)
Fats & oils	25	32.64±5.31 (130.56)	24.07±9.49 (96.28)	-34.28	2.94 ^(*)

- Values are mean ± SD.
- RDI= Recommended Dietary Intake (ICMR 2010) [8].
- n-indicates the number of respondents.
- Figures in parentheses indicate per cent of RDI.
- t-values indicated comparison of pre and post scores.
- *Significant at 5% NS-Non Significant.

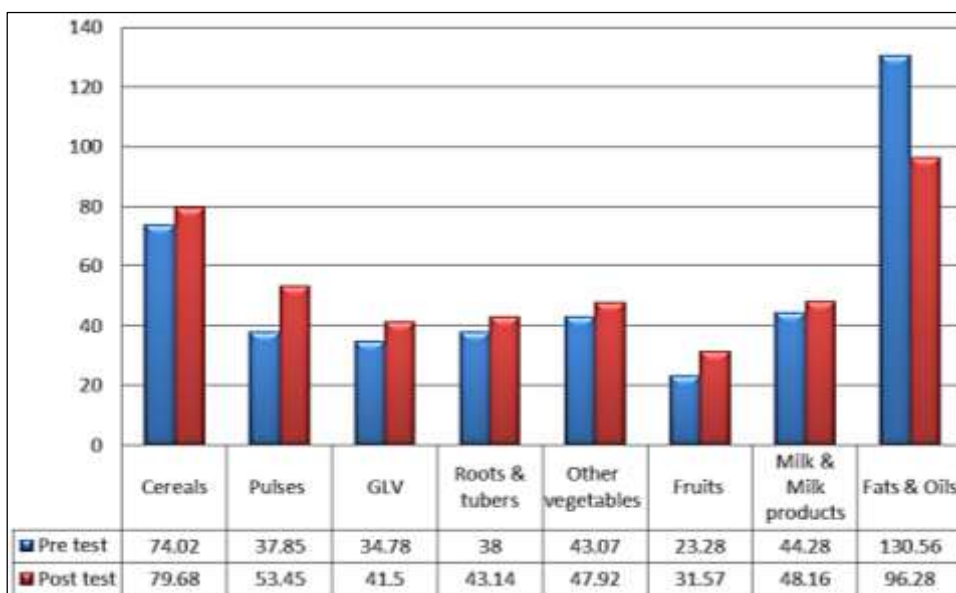


Fig 2: Comparison between pre and post-test of daily food intake (% RDI) of middle class respondents (15-19 years)

Data in (Table 3) indicated that before nutrition intervention, the daily intake of cereals and pulses of respondents who belonged to upper class was 227.25 and 29.12 g/day (75.75 and 48.53% of RDI). After imparting education and counselling, intakes of cereals and pulses by selected girls were increased and the mean daily intake was 247.68 and 35.43 g/day (82.56 and 59.05% of RDI).

Daily mean intake of green leafy vegetables, roots and tubers and other vegetables of girls of upper class family was 36.5, 39.37 and 46.62 g/day and it increased to 44, 47.12 and 52.31 g/day after nutrition education and counselling.

Before imparting knowledge, it was shown that consumption of fruits by respondents of upper class families was 27.37 g/day which increased to 38.06 g/d and daily intake of milk and milk product was 243.75 g/day (48.75% of RDI) and it increased to 262.56 g/day (52.51% of RDI) after counselling and nutrition intervention.

It was found that before counselling, the daily intake of fats and oils by upper class girls were more as compared to RDI (25 g). The mean intake fats and oils was 35.87 g/day (143.48% of RDI) and after one month of nutrition education it was slightly declined to 24.37 g/day (97.48% of RDI).

Table 3: Effect of nutrition education and dietary counselling on mean food intake of respondents belonging to upper class family

Upper class n=8					
Food groups	RDI (gm)	Pre-test (gm)	Post-test (gm)	% change	t-value
Cereals	300	227.25±15.12 (75.75)	247.68±31.31 (82.56)	+6.81	1.66 ^(NS)
Pulses	60	29.12±7.45 (48.53)	35.43±6.14 (59.05)	+10.52	1.84 ^(NS)
GLV	100	36.5±7.7 (36.5)	44±4.24 (44)	+7.5	2.41 ^(*)
Roots & tubers	100	39.37±10.05 (39.37)	47.12±10.28 (47.12)	+7.75	1.52 ^(NS)
Other vegetables	100	46.62±28.14 (46.62)	52.31±24.59 (52.31)	+5.69	0.43 ^(NS)
Fruits	100	27.37±25.01 (27.37)	38.06±21.78 (38.06)	+10.69	0.91 ^(NS)
Milk & milk products	500	243.75±137.92 (48.75)	262.56±136.63 (52.51)	+3.76	0.27 ^(NS)
Fats & oils	25	35.87±4.79 (143.48)	24.37±6.13 (97.48)	-46	4.17 ^(*)

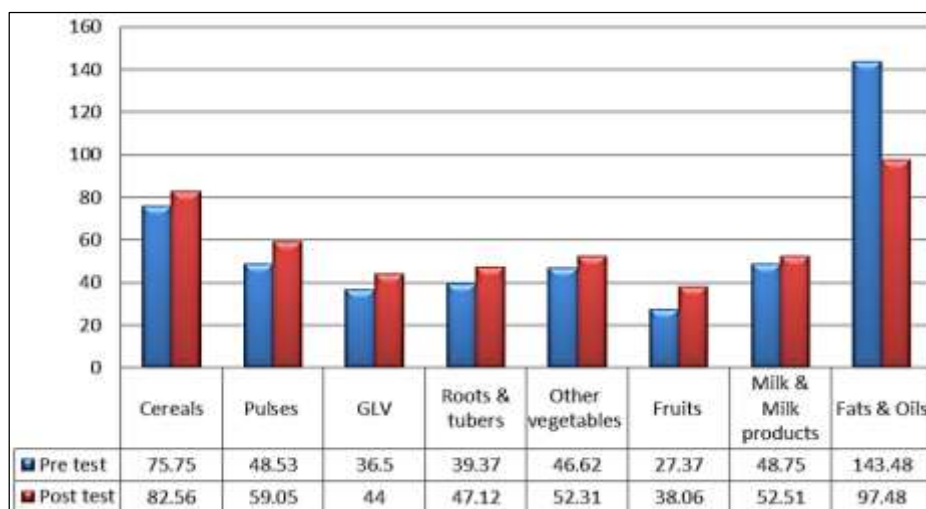


Fig 3: Comparison between pre and post-test of daily food intake (% RDI) of upper class respondents (15-19 years)

The results of the current investigation are supported by Kamalaja *et al.* (2018) ^[10]; from that study, it was found that intakes of all foods and nutrients by both experimental and control groups were not adequate. But after imparting education it was shown that intakes of all food groups were higher in the experimental group than control group. So from that study, it was confirmed that nutrition education was given positive impact in the dietary habits of the respondents.

Conclusion

It was shown that as income increased the intake of all food stuffs also increased but when it was compared with Recommended Dietary Intake (ICMR 2010) ^[8], a gradual decline was observed in every income group. Regarding consumption of fats and oils by respondents of every income group were more as compared to RDI. It was observed that the poor nutritional status of adolescent girls was found low in each income group irrespective of their class. But it also showed that after nutrition intervention and dietary counselling, intake of all foodstuffs and nutrients was slightly increased by respondents of each socio-economic group. Positive changes were shown in every income group of girls.

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