ESTIMATION OF CONSUMPTION OF DAIRY PRODUCTS IN LATE ADOLESCENCE (17-19 YEARS) AND DEVELOPMENT OF A NUTRITION COUNSELING AID TO IMPROVE DAIRY CONSUMPTION

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INTRODUCTION

- Dairy products are foods or drinks that are created from milk of mammals such as cow, buffalo, goat or sheep
- Calcium constitutes nearly 99% of total body calcium and is located in the skeleton the remaining 1% is equally distributed between teeth and other soft tissues and only 0.1% is in the extra cellular fluid (ECF), muscles, blood and other tissues
- Calcium requirements for skeletal development are greater during adolescence than childhood
- Inadequate calcium consumption may lead to bone weakness, and a greater risk of developing osteoporosis

- Adolescence is a period of rapid growth where, up to 45% of skeletal growth takes place and up to 25% of adult height is achieved. During the growth spurt up to 37% of total bone mass may be accumulated.

- In some parts of India, young girls' food consumption is limited because of the fear that they will grow too rapidly and will be married soon.
- Girls are probably more exposed than boys to inadequate intakes because of social discrimination, dieting or lower energy intake and pregnancy.

STATEMENT OF PROBLEM

- Institute Of Medicine (IOM) 2006 (WHO 2003) has stated it is only by the age of 18 years that females acquire 92% of their bone mass hence, adolescence is a crucial time to focus on bone health

- Adequate calcium intake among this age group is extremely important for achievement of peak bone mass (Mesías et al, 2011)

- Girls are chosen because as mentioned in a study by Rajeshwari et al (2003) 99% of adolescent girls in her study from North India suffered from problems relating to nutritional osteomalacia which is essentially due to poor dietary practices of calcium

- It seems that rising prices of milk and changing lifestyles have put a dampener on consumption growth of milk and milk products. Also it is likely that traditional culture of milk consumption has been losing out to continued competition from new beverages including carbonated beverages, fruit juices, tea, coffee etc.
- NSSO 2000 data has revealed that adolescent girls consumed <70% of RDA for calcium during the study period of 2004-2005

Table 14 Distribution (%) of Adolescents according to Intake of Nutrients as % of RDA

Nutrients	Percent RDA	Boys		Girls	
		1975-79	1996-97	1975-79	1996-97
Protein	<50	7.3	2.5	8.9	3.7
	<70	23.4	12.9	25.2	15.4
Total Fat	<50	32.3	18.2	34.3	23.0
	<70	50.6	31.6	50.6	37.7
Energy	<50	21.1	9.3	14.3	5.3
	<70	54.3	34.0	43.5	24.8
Calcium	<50	48.8	36.9	49.0	43.2
	<70	65.6	54.2	68.7	59.6
Iron	<50	45.8	41.5	18.1	10.8
	<70	70.9	73.2	39.1	35.5
Vitamin A	<50	84.8	75.4	85.1	79.0
	<70	89.2	82.2	90.0	83.8
Thiamin	<50	29.1	19.0	30.6	16.2
	<70	41.1	41.4	40.4	39.5
Riboflavin	<50	59.5	43.1	55.4	37.8
	<70	80.2	73.6	74.7	64.5
Niacin	<50	27.1	18.6	22.8	13.6
	<70	52.9	46.3	46.6	40.6
Vitamin C	<50	45.0	36.5	46.1	37.2
	<70	58.8	49.7	60.0	49.6

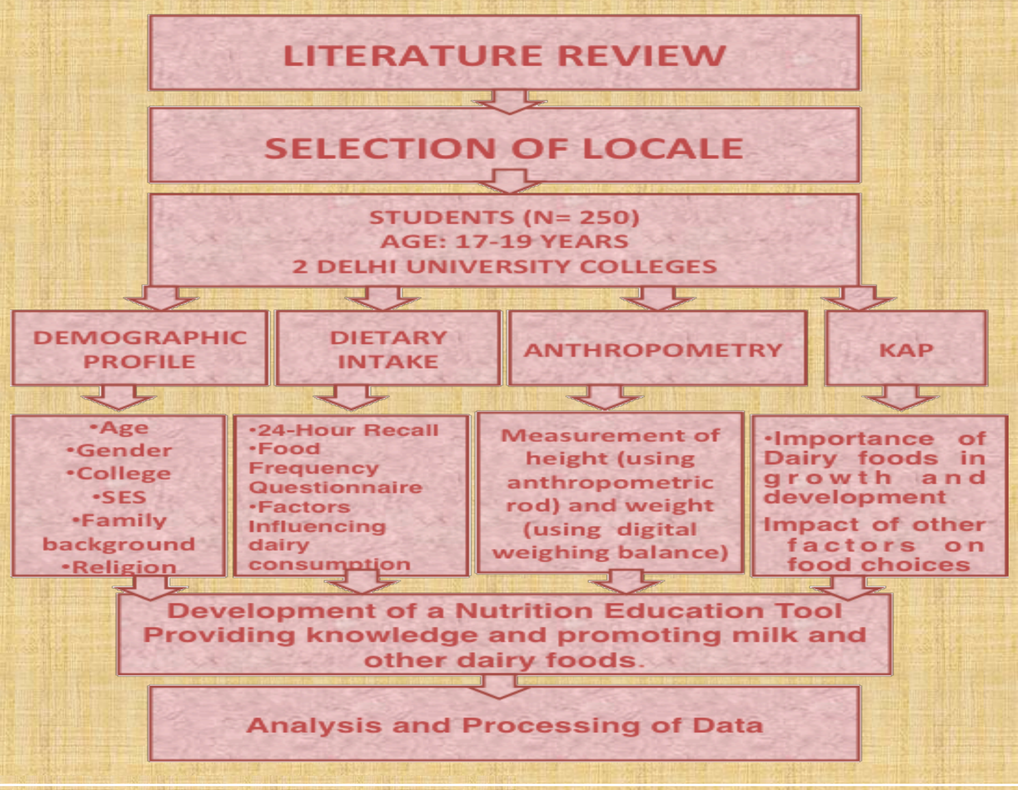
OBJECTIVES

Main Objective:

- To assess milk and dairy food consumption pattern among adolescents (17-19 years) and development of a nutrition counseling aid to educate participants about benefits of the same.

Specific Objectives:

- To assess the adequacy of dairy foods in the diets of adolescents
- To determine factors conducive and deterrent to dairy food intake
- To estimate their food and nutrient intake
- To assess the nutritional status of the adolescents
- To develop a nutrition counseling aid to educate the subjects on the benefits of dairy consumption
- To compare knowledge, attitude and practices levels before and after nutrition counseling.



METHODOLOGY

- Two Delhi university colleges were selected purposively
- Sample size of study was 250 (N) and a sub-sample of 50 (n) girls were selected
- Study period ranged from October 2015 to April 2016
- The study was conducted in two phases: collection of general socio-demographic profile and second where dietary and anthropometric data on sub-sample was collected
- An education aid was developed with aim of improving the knowledge about dairy and improve their consumption
- Knowledge Attitude Practices was evaluated before and after nutrition education.

TOOLS USED FOR DATA COLLECTION

- Questionnaire
- Dietary Survey
  - ✓24-hour recall
  - ✓Semi- quantitative questionnaire
- Anthropometric measurements
  - ✓Measurement of height
  - ✓Measurement of weight
- Nutrition Counseling Aid
- KAP Questionnaire

RESULTS

- Factors affecting the dairy intake among adolescents were observed to be:
  - ✓Income of the family
  - ✓Number of family members
  - ✓Amount of milk purchased
  - ✓Family education levels
  - ✓Social environment (peers)
  - ✓Preference towards other beverages
  - ✓Source of knowledge
- Improvements in following parameters were observed :
  - Amount of daily intake of milk improved from a cup to glass
  - Inclusion of different dairy products like buttermilk and curd along with yoghurt
  - Choosing dairy products over carbonated beverages

- Dietary data reveled adqequacy of milk intake to be 90.6% and that of calcium was 100.3 %

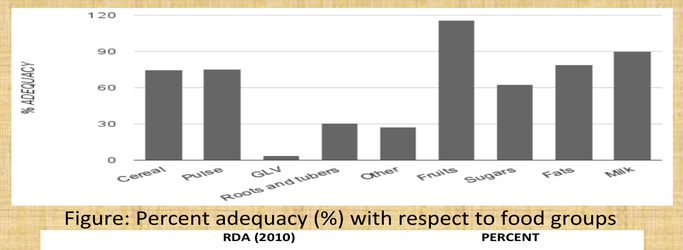


Figure: Percent adequacy (%) with respect to food groups

NUTRIENT	RDA (2010) (g/day)	MEAN ± SD	PERCENT ADEQUACY
ENERGY (kcal/d)	1900	1171.95 ± 355.13	61.68
PROTIEN (g/d)	55	38.49 ± 11.67	69.98
VISIBLE FAT(g/d)	25	20.17 ± 14.88	80.6
IRON (mg/d)	21	7.72 ± 2.89	36.75
CALCIUM (mg/d)	600	661.80 ± 250.76	110.3
FOLIC ACID (µg/d)	200	106.25 ± 48.43	53.12
VITAMIN-A (µg/d)	600	392.77 ± 339.82	65.46
ASCORBIC ACID (mg/d)	40	33.46 ± 37.14	83.66
RIBOFLAVIN (mg/d)	1.1	0.94 ± 0.36	85.26
THIAMIN (mg/d)	1	0.77 ± .25	76.61

Fig: Mean and sd of nutrient intake of subjects (n=50) (17- 19 years)

FREQUENCY OF CONSUMPTION OF DAIRY FOODS

	Frequency of dairy food consumption				Once a month	Rarely
	Daily	Weekly				
		5-6 times	3-4 times	1-2 times		
FOOD PRODUCT						
MILK	**78%**	**12%**	**24%**	**22%**	**6%**	**10%**
CURD	**44%**	**24%**	**24%**	**14%**	**8%**	**0**
BEVERAGE	**34%**	**34%**	**26%**	**46%**	**4%**	**4%**
OTHER	**14%**	**20%**	**32%**	**34%**	**6%**	**2%**
SWEETS	**10%**	**12%**	**36%**	**38%**	**22%**	**8%**

- Milk which was consumed either as plain milk , flavored or with Horlicks and Bounvitta.
- Curd intake was recorded either in the form of plain curd or *raita*.
- Other dairy products that were included were *paneer* , *khoa, cheese* and *cream.* Most of the girls mentioned *paneer* and cheese as their favorite dairy products
- Desserts such as ice-cream, *kulfi*, custard, *kheer, rabri*, etc. were recorded to be highest

COMPARISION OF PRE AND POST KAP SCORES

Scores suggested that participants did show some improvement with the administration of education aid

	TOTAL SCORE		PRE KAP	POST KAP	DIFFERENCE
KNOWLEDGE	10	Mean	4.25	6.01	1.76
		SD	± 1.97	± 1.65	
ATTITUDE	40	Mean	21.19	34.85	13.66
		SD	± 4.77	± 3.52	
PRACTICE	10	Mean	8.27	10.60	2.33
		SD	± 2.29	± 2.53	
TOTAL	60		33.71	51.46	17.75