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Nutritional status of urban and semi-urban pre-school children of Dharwad

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Abstract
Nutrition during early childhood is of paramount importance because it is a foundation for life time health, strength and intellectual vitality. The study has been conducted with the objective to assess demographic profile and nutritional status of urban and semi-urban pre-school children of Dharwad District. A sample size of 100 pre-school children (3-6 years), where 50 children from the urban and 50 children from semi-urban areas were randomly selected from Dharwad District. The results indicated that majority of mothers and fathers of urban children had completed graduation (32% and 54%, respectively). In case of semi-urban group, majority of mothers and fathers had completed high school education (46% and 52%, respectively). Majority of mothers in urban area were house wives (46%) compared to semi-urban mothers (22%). In case of fathers, majority of urban fathers involved in self-employment category (50%) but very few per cent of fathers from semi-urban area were involved in self-employment category (22%). Nutritional status was assessed and categorised according to Water low's classification. With respect to nutritional status, normal children were more in urban group (92%) than the semi-urban group (78%). Six per cent and 2 per cent of urban group children were stunted and wasted, respectively. Semi-urban group consists 14 per cent stunted, 6 per cent wasted and 2 per cent wasted and stunted children, respectively.

Keywords: education, occupation, nutritional status and pre-school children

Introduction
Nutrition during early childhood is of paramount importance because it is a foundation for life time health, strength and intellectual vitality and it is characterized by rapid growth with increased muscle mass, growth of organs, expansion of blood volume and linear increase in the long bones. Children need proper nutritional care not only to promote growth and also to maintain their optimum health and nutritional status.
In India, as per the National Family Health Survey (NFHS-4) in 2015-16, 35.7 per cent children below five years were underweight, 38.4 per cent were stunted and 21 per cent were wasted. They constitute about 36% of the total population of India. The world health organization reports that half of the malnourished children in the world live in Asia and Africa, including children in India. Under-nutrition continues to be a major public health problem in most of the developing countries, nearly half of the children in India are unable to grow to their full physical and mental potential owing to under-nutrition. It is now well recognized by government and other organizations that improving the nutritional status of children during school years can contribute to educational achievement to an individual and a country's socio-economic development in the long term. The following study has been taken up with the objective to assess the demographic profile and nutritional status of urban and semi-urban pre-school children of Dharwad District.

Research Methodology
The target subjects were selected from semi-urban and urban pre-schools of Dharwad. A sample size of 100 pre-school children (3-6 years) were selected for the study, where 60 children from the age group of 3-4 years, 20 children from 4-5 years, 20 children from 5-6 years were randomly selected from semi-urban and urban school, Dharwad, separately. Consent of school authorities and parents of selected children were obtained prior to inclusion of children in the investigation. Demographic information was collected from the parents by using questioner and the data was processed, scored, tabulated and analyzed using simple tools like, frequency and percentage. Nutritional status of pre-school children was assessed based on Anthropometric measurements *viz.* Weight (kg), height (cm), MUAC (cm) and head circumference (cm) and chest circumference (cm) as per the guidelines suggested by Jelliffe (1966) [2]. And categorised the children based on Water low's classification.

Results and Discussions
General information of urban and semi-urban pre-school children
General information of preschool children (N = 100) enrolled for study was given in Table 1. Among the 100 preschool children enrolled for the study, 25 (50%) were boys and 25 (50%) were girls from both urban and semi urban preschools. It was observed that higher per cent of study subjects were from the age group of 3 to 4 years (60%) followed by 4.1 to 6 years (40%) from both preschools. According to the ordinal position, It was noted that higher per cent of children from both urban (66%) and semi-urban area (56%) were first born, followed by second born in urban (34%) and in semi- urban area (26%). There was no third born children in urban, whereas in case of semi-urban area about 18 per cent of children were third born.

Table 1: General information of urban and semi-urban pre-school children N=100

Variables	Classification	Urban (n=50)		Semi-urban (n=50)	
		N	%	n	%
Gender	Boys	25	50	25	50
	Girls	25	50	25	50
Age (years)	3 - 4	30	60	30	60
	4.1 - 5	10	20	10	20
	5.1 - 6	10	20	10	20
Ordinal position	1st	33	66	28	56
	2nd	17	34	13	26
	3rd	0	0	9	18
Religion	Hindu	47	94	48	96
	Muslim	2	4	2	4
	Christian	0	0	0	0
	Buddhism	1	2	0	0
Caste	Upper caste	20	40	14	28
	OBC	23	46	9	18
	SC/ST	7	14	27	54
Family type	Nuclear	37	74	29	58
	Joint	13	26	21	42
Mother's age (years)	20-25	11	22	26	52
	26-30	25	50	14	28
	31-35	14	28	10	20
Father's age (years)	25-30	15	30	17	34
	31-35	20	40	22	44
	36-40	15	30	11	22

Majority of children enrolled in urban (94%) and semi-urban group (96%) belonged to Hindu religion and only 4 per cent of the children from both groups were Muslim and only one child from urban group belonged to Buddhism. Regarding caste, majority (46%) of children belonged to OBC in urban group and majority (54%) of children belonged to scheduled caste in semi-urban group followed by 40 per cent of urban group and 28 per cent of semi urban children belonged to upper caste. Only 14 per cent of urban group children belonged to SC/ST and only 18 per cent of semi-urban children belonged to OBC. With respect to family type, about 74 per cent of children from urban and 58 per cent of children from semi-urban were belonged to nuclear family and 26 per cent of urban, 42 per cent of semi-urban children were from joint family. Generally joint families are headed by oldest person of the family having traditional outlook restricting them to adopt modern culture technique and living practices. On the other hand the new generation adopts these culture and practices very easily to pace with the modernization and western culture. These reasons have significantly affected increase of nuclear families. Kashyap (1992) [3] Mehrotra (2002) [4] and Srivastava (2012) [6] have also reported similar findings.

Parental education and occupational status

Distribution of children according to parental education and occupational status was given in Table 2. It was noticed that, 50 per cent of mothers of urban children were in the age group of 26- 30 years, followed by 31 - 35 years (28%) and 20 - 25 years (22%). While more than 50 per cent of mothers of semi-urban (52%) children were in the age group of 20-25 years, followed by 26-30 years (28%) and very few mothers were in the age group of 31-35 years (20%). In case of fathers age, higher per cent of fathers of urban (40%) and semi urban (44%) children were in the age group of 31- 35 years, followed by 25 -30 years (30% and 34%, respectively) and very few fathers of urban and semi-urban children were in the age group of 36 - 40 years (30 and 22%, respectively).

Majority of mothers and fathers of urban children had completed graduation (32% and 54%, respectively) followed by PUC (28% and 22%, respectively), high school education (22% and 14%, respectively), post-graduation (12% and 8%, respectively) and nearly equal per cent of mothers and fathers of urban children had primary schooling (2% respectively) and only 4 per cent of mothers were illiterate in urban group. In case of semi-urban group, majority of mothers and fathers had completed high school education (46% and 52%, respectively), and only fathers had completed graduation (22%) but none of the mothers was graduate, followed by primary schooling (38% and 14%, respectively) and illiterate (10% and 4%, respectively) and none of the mother and father of the semi-urban school children were in post-graduation group.

Table 2: Distribution of children according to parental education and parental occupation N=100

Variables	Classification	Urban (n=50)		Semi-urban (n=50)	
		n	%	n	%
Mother's education	Illiterate	2	4	5	10
	Primary schooling	1	2	19	38
	High school education up to 10th	11	22	23	46
	Pre-university education (PUC)	14	28	3	6
	Graduation	16	32	0	0
	Post-graduation	6	12	0	0

Father's education	Illiterate	0	0	2	4
	Primary schooling	1	2	7	14
	High school education up to 10th	7	14	26	52
	Pre-university education (PUC)	11	22	4	8
	Graduation	27	54	11	22
	Post-graduation	4	8	0	0
Mother's occupation	House wife	23	46	11	22
	Self-employment	11	22	7	14
	Farming	0	0	12	24
	Agricultural labour	0	0	16	32
	Service in private sector	9	18	2	4
	Service in central/state/public sector	7	14	2	4
Father's occupation	Unemployment	0	0	1	2
	Self-employment	25	50	11	22
	Farming	6	12	16	32
	Agricultural labour	0	0	11	22
	Service in private sector	9	18	7	14
	Service in central/state/public sector	10	20	4	8

With respect to occupational status of the parents, it was observed that majority of mothers in urban area were house wives (46%) compared to semi-urban mother's (22%). None of the mother involved in farming and agricultural labour in urban area but majority of mothers from semi-urban area involved in farming (24%) and worked as agricultural labour (32%). More number of mothers from urban area involved in self-employment category (22%) compared to semi urban mothers (14%). In urban area, 18 per cent and 14 per cent of mothers were working in private sector and public sector, respectively and nearly equal per cent of semi-urban mothers were working in private and public sector (4%).

In case of father's, majority of urban father's involved in self-employment category (50%) but very few per cent of father's from semi-urban area were involved in self-employment category (22%). In semi-urban area, 32 per cent and 22 per cent of father's were involved in farming and working as agricultural labours, respectively and 12 per cent of father's from urban area involved in farming and none of them working as agricultural labour. In urban area, 18 per cent and 20 per cent of father's were working in private sector and public sector, respectively and 14 per cent of father's from semi-urban area working in private and 8 per cent of father's working in public sector. It was observed that none of the father in urban area was unemployed and in semi-urban area only one father is unemployed. The results are also confirmed with the results of Sharma *et al*. (2012) [7] and Pettifor *et al*. (2009) [5].

Anthropometric measurements of pre-school children

Anthropometric measurements of preschool children enrolled in the investigation, were presented in the Table 3. It was observed that, the weight of the children did not vary significantly among the urban and semi-urban group. The mean weight of the children belonging to urban group was 13.87 kg and semi-urban group recorded 13.07 kg.

It was observed that, the difference in the height of urban and semi-urban children was not significant. The mean height of the children belonging to urban group was recorded to be 96.75 cm and the children belonging to semi-urban group recorded the mean height of 96.93 cm. It was observed that mid upper arm circumference (MUAC) of children was not statistically significant between the groups. The mean MUAC of the children in the urban group was 14.92 cm and semi-urban group recorded 14.50 cm.

The head circumference of children between urban and semi-urban group was statistically significant ($P \leq 0.01$). The mean head circumference of children belonging to urban group was 47.82 cm and semi-urban group recorded 46.88 cm. It was observed that the chest circumference of the children between urban and semi-urban group was statistically significant ($p \leq 0.01$), the mean chest circumference of children in the urban group was 50.75 cm and semi-urban group recorded 49.20 cm. Significant difference ($p \leq 0.05$) was observed among the urban and semi-urban groups for head to chest circumference ratio. The mean head to chest circumference of children in urban group was 0.94 and semi-urban group recorded 0.95. Below table showed that, anthropometric measurements of semi-urban preschool children was lower than the urban children. Contrasting results were reported by Wadakappanavar *et al.* (2015) [8] they stated that regional differences was not found in anthropometric measurements between rural and urban children.

Table 3: Anthropometric measurements of pre-school children N = 100

Anthropometric measurements	Urban (n = 50) Mean ± SD	Semi-urban (n = 50) Mean ± SD	Urban v/s semi-urban 'Z' value
Weight (kg)	13.87 ± 2.73	13.07 ± 2.31	1.58 ^{NS}
Height (cm)	96.75 ± 7.28	96.93 ± 7.41	0.12 ^{NS}
MUAC (cm)	14.92 ± 1.44	14.50 ± 1.08	1.65 ^{NS}
HC (cm)	47.82 ± 1.48	46.88 ± 1.45	3.20**
CC (cm)	50.75 ± 3.44	49.20 ± 2.42	2.60**
HC:CC	0.94 ± 0.05	0.95 ± 0.04	1.89*

MUAC- Mid Upper Arm Circumference
HC- Head Circumference
CC- Chest Circumference
HC: CC - Head to Chest circumference ratio

* Significant at 0.05 level
** Significant at 0.01 level

Categorization of pre-school children based on Water low's classification

Table 4 provides data for Water low's classification of children with different degrees of malnutrition. Water low's classification includes both weight for height and height for age. Classification based on locality showed that normal children are more in urban group (92%) than the semi-urban group (78%). Six per cent and 2 per cent of urban group children were stunted and wasted, respectively. Semi-urban group consists 14 per cent stunted, 6 per cent wasted and 2 per cent wasted and stunted children, respectively. In Similar results were reported by Amosu *et al*. (2011) [1], Wadakappannavar *et al.* (2015) [8].

Table 4: Categorization of pre-school children based on Water low's classification N N= 100

Classification	Urban (n = 50)				Urban		Semi-urban (n = 50)				Semi-urban	
	Girls (n = 25)		Boys (n = 25)				Girls (n = 25)		Boys (n = 25)			
	n	%	n	%	n	%	n	%	n	%	n	%
Normal	22	88	24	96	46	92	20	80	19	76	39	78
Stunted	2	8	1	4	3	6	4	16	3	12	7	14
Wasted	1	4	0	0	1	2	1	4	2	8	3	6
Wasted and stunted	0	0	0	0	0	0	0	0	1	4	1	2

Classification of pre-school children based on mid upper arm circumference and head to chest circumference ratio

Table 5 indicates data on classification of pre-school children into different degrees of malnutrition based on mid upper arm circumference and head to chest circumference ratio. Irrespective of locality among urban and semi-urban groups, majority were normal (90% and 82%, respectively) followed by moderate malnutrition (10% and 16%, respectively) and only one child from semi-urban group belonged to severe malnutrition.

Based on head to chest circumference ratio, irrespective of locality among urban and semi-urban groups, majority were normal (86% and 82%, respectively) followed by malnourished (14% and 18%, respectively).

Table 5: Classification of pre-school children based on mid upper arm circumference and head to chest circumference N = 100

Classification	Urban (n = 50)				Urban		Semi-urban (n = 50)				Semi-urban	
	Girl (n = 25)		Boys (n = 25)				Girls(n = 25)		Boys(n = 25)			
	n	%	n	%	n	%	n	%	n	%	n	%
MUAC (cm)												
Normal (> 13.5)	23	92	22	88	45	90	20	80	21	84	41	82
Moderate malnutrition (12.5 - 13.5)	2	8	3	12	5	10	5	20	3	12	8	16
Severe malnutrition (< 12.5)	0	0	0	0	0	0	0	0	1	4	1	2
Head to Chest circumference ratio												
Normal (< 1)	20	80	23	92	43	86	23	92	18	72	41	82
Malnourished (≥ 1)	5	20	2	8	7	14	2	8	7	28	9	18

Conclusions

Parents educational status and occupational status was higher in urban group compared to semi-urban group, Normal children were more in urban group (92%) than the semi-urban group (78%). Results depicted that good educational status and economic profile of parents showed better nutritional picture in children. Hence there is a need to provide nutrition education to parents and supplementation programme for pre-school children.

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