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Breakfast consumption pattern of pre-school children

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A study has been carried out to assess the breakfast consumption pattern of pre-school children of Dharwad taluk, Karnataka.A total of 551 pre-school children of 3 to 5 years were randomly selected from rural and urban areas of Dharwad. Breakfast consumption pattern was assessed personally by interviewing the mothers of children using self-structured questionnaire. Irrespective of age, and locality 73.10 per cent of children consumed breakfast regularly (>5 times a week) while remaining 26.90 per cent were not regular in consumption(<4 times a week). *Biscuits* were consumed by higher per cent (91.86%) of children followed by *Idli* (84.78%), *Dosa* (84.60%) and *Paddu* (74.50%). Majority of rural children consumed *Idli* (86%), *Upma* (84%), biscuits (84%), *Paddu* (82.80%) and *Avalakki* (80.80%). Whereas urban children consumed biscuits (98.10%), *Dosa* (90.79%) and *Idli* (83.81%). Tea was common beverage among rural children (80.80%) compared to urban (76.19%). Approximately 25 and 31 per cent of rural and urban children consumed fruits for breakfast either alone or with solid food. Higher per cent of rural children (95.60%) consumed breakfast at home on holidays than urban children (65.71%). More than 50 per cent of rural (54.00%) and urban (53.33%) children ate only his or her choice of food for breakfast. Major reasons quoted for skipping breakfast included lack of appetite, mother was busy, getting up late in the morning and run to school, interested in playing rather than eating and no one to prepare breakfast. Children are wealth of any nation as they constitute one of the important segments of the population.

Key Words : Pre-school, Consumption pattern, Pre-school children

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INTRODUCTION

Breakfast is considered an important meal of the day (Marika, 2003). It is described as the first meal which breaks the fast that had been on for over twelve to fourteen hours (Wayon *et al.,* 1997). It is comprised of food or beverage from at least one food group, and may be consumed at any location (Dwyer, 2014). Breakfast should provide 25 per cent of the daily nutrient requirement to an individual (Gibson and O'Sullivan, 1995). It is a fact that gap between dinner and breakfast is so high that an individual is really starving. Without a breakfast there is the possibility of low blood glucose levels (hypoglycaemia) and low metabolic rate, irritability and fatigue (Marika, 2003). An ideal time for breakfast is 8.00 am to 10.00 am. However for early birds and flight catchers it may be from 4.00 am onwards. The quality of the breakfast is important as the nutritional status of a child can be affected as well as the physical and mental growth, health and general well-being of the child (Dams and Metzl, 2000). Breakfast is an important different in the health of children as the body is low in energy reserve and there is a need for frequent supply of energy needed for the day (Lo´pez-Sobaler *et al.*, 2003).

It is scientifically proven that fat burning processes are most active in the morning, so healthy breakfast in

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the morning will boost metabolism to burn fat and calories and will give body a good energy start for the day. Eating breakfast reduces hunger later in the day, in turn helps to avoid overeating, and facilitates healthy choices of food. Studies have shown that breakfast is associated with improved strength and endurance in the late morning as well as better attitude towards school work (Murphy, 1998 and Rampersand and Pereira, 2005). Breakfast intake is reported to be influenced by factors such as socio environment variables (eg, gender, race, parents' education level or occupation, poverty, family structure, and community context) and personal beliefs (such as, health concerns and perceived barrier and benefits regarding breakfast (Dehdari *et al*., 2014).

Breakfast skippers are those who eat breakfast about once in week or less often and those who never eat breakfast (Siega-Riz *et al*., 1998). This can pose serious problems for a child's daily nutritional intake. It provides fuel to begin the day. Breakfast consumption is associated with positive outcomes for diet quality, micronutrient intake, weight status and lifestyle factors. Breakfast has been suggested to positively affect learning in children in terms of behaviour and school performance. Eating breakfast improves the overall quality and nutrient intake of the diet. Conversely, breakfast skippers may not make up for missed nutrients during other meals of the day whether they are children, adolescents or adults.

Children are wealth of any nation as they constitute one of the important segments of the population. Childhood is a critical period in which dietary and lifestyle patterns are initiated, and these habits can have important immediate and long-term implications (Murphy, 1998). The foundation of good health and sound mind is laid during pre-school, so it is a basic milestone in life of an individual and responsible for many changes that may take place during later life. Hence the study has been undertaken to study the breakfast consumption pattern of pre-school children.

METHODOLOGY

Study area and sampling :

The study was conducted in rural and urban areas of Dharwad taluk, Karnataka, India during 2013-2015. A total of 13 Anganwadis were contacted, total of 565 pre-school children in the age group of 5-6 years attending Anganwadis were selected randomly.

Breakfast consumption pattern :

Information on breakfast consumption of selected pre-school children was obtainedby interviewing the mothers of the children, personally with the use of structured validated questionnaire. Breakfast consumers and skippers were classified as always, often, sometimes and rarely (Liu *et al*., 2013), according to the regularity of breakfast consumed by the children.

Tools and techniques :

The data were analysed using the statistical package for social science (SPSS). Descriptive statistics (frequency distribution, percentages), were used to analyze the data.

OBSERVATIONS AND ASSESSMENT

Breakfast behaviour includes consumption and skipping of breakfast and frequency of consumption of breakfast. Distribution of pre-school children based on breakfast consumption pattern is reported in Table 1 and Fig. 1. Irrespective of age, and locality 73.10 per cent of children consumed breakfast regularly (>5 times a week) while remaining 26.90 per cent of them did not consume regularly (<4 times a week). Irrespective of locality, the percentage of children consuming breakfast regularly increased with increase in age (69.35 at 3years, 72.29 % at 4 years and 80.78 at 5 years) till five years and decreased later. Similar trend was observed in children of both rural and urban areas.

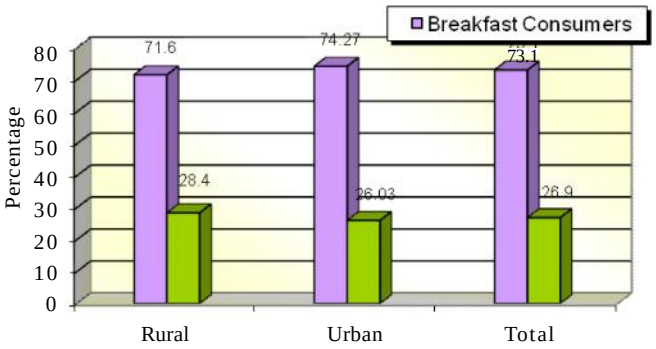

Fig. 1 : Distribution of pre-school children according to breakfast consumption pattern

Fig. 2 provides the data on reasons for not consuming regular breakfast by pre-school children. The study reports that more than 50 per cent of rural (54.00 %) and urban (53.33 %) children ate only foods of his or her choice of food for breakfast. Approximately 15 per cent

of rural children and 13.65 per cent of urban children did not consume breakfast due to lack of appetite. Breakfast skipping is increasingly wide spread among children, adolescents and adults. Breakfast consumption of children is of public health concern, since it makes an important nutritional contribution to overall dietary quality for children. Yet breakfast is most commonly missed than any other meal (Dwyer *et al.*, 2001). Skipping breakfast because of the reasons *viz*, doesn't like to eat in the morning and lack of appetite in the morning (Shaw Mary, 1998) were quoted often. Around 27 per cent of the pre-school children enrolled for the present study skipped breakfast (Table 1 and Fig.1), the reasons being not feeling hungry, getting up late, mother is busy, eat only his or her choice of foods, don't like to eat in the morning etc. (Fig. 2). Intifuli and Lartey (2014) reported that 14.5 per cent of the children of six to 12 years did not have breakfast in Ghana, and the reasons being lack of money or absence of food for breakfast at home, not hungry, no time to eat breakfast, don't like to eat breakfast. Wahba *et al.*, 2006 and Veghari and Mansourian (2012) and reported similar reasons for skipping breakfast *viz*., not accustomed to morning meal, lack of appetite in the morning, mothers not getting up early, uninteresting food for breakfast and absence of fourite food were the common reasons.

Irrespective of locality among the food items, *biscuits* were consumed by higher per cent (91.86 %) of the study children followed by *Idli* (84.78 %), *Dosa* (84.60 %) and *Paddu* (74.50 %). Between 40 and 50 per cent of the children consumed jowar *Roti* (49.56 %), noodles (49.38 %), *Puri* (49.38 %), rice (45.49 %) and bread (43.54 %). Among rural children majority of them consumed *Idli* (86 %), *Upma* and biscuits (84 % each), *Paddu* (82.80 %) and *Avalakki* (80.80 %). Majority of urban children consumed biscuits (98.10 %), *Dosa* (90.79 %) and *Idli* (83.81 %) as shown in Table 2. Among the food items, *Paddu*, *Dosa* and biscuits were liked by majority of children in rural and urban area (Table 2). Due to this, these foods were frequently consumed by majority of the children for breakfast (Table 5). This is advantageous nutritionally as there are easily digestible fermented foods that increase availability of nutrients.

The information on beverages consumed at breakfast by the pre-school children is narrated in Table 3. Irrespective of locality, tea (78.23 %) was found to be the most popular beverage among pre-schoolers and was consumed either alone (44.29 %) or with solid food (89.11

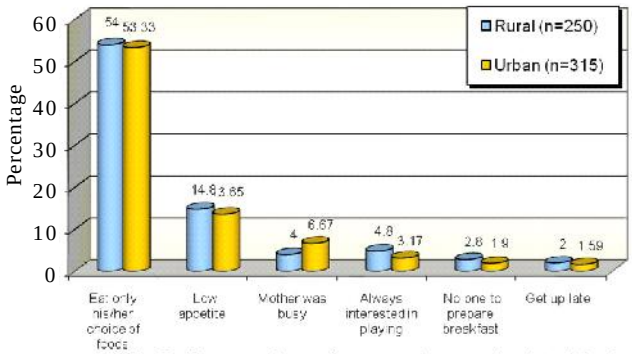

Fig. 2 : Reasons for not consuming regular breakfast

Table 1 : Distribution of pre-school children according to breakfast consumption pattern **(n = 565)**

Age (yrs)	Rural (n=250)				Urban (n=315)				Total			
	Always	Often	Sometime	Rarely	Always	Often	Sometime	Rarely	Always	Often	Sometime	Rarely
3 (n=186 R=87 U=99)	41 (47.13)	14 (16.09)	28 (32.18)	4 (4.59)	51 (51.52)	23 (23.23)	17 (17.17)	8 (8.08)	92 (49.46)	37 (19.89)	45 (24.19)	12 (6.45)
4 (n=213 R=86 U=127)	52 (60.46)	10 (11.62)	18 (20.93)	6 (6.97)	74 (58.26)	18 (14.17)	23 (18.12)	12 (9.45)	126 (59.15)	28 (13.14)	41 (19.24)	18 (8.49)
5 (n=151 R=70 U=81)	52 (74.28)	7 (10.00)	9 (12.85)	2 (2.85)	48 (59.25)	15 (18.51)	11 (13.58)	7 (8.64)	100 (66.22)	22 (14.56)	20 (13.24)	9 (5.96)
6 (n=16 R=07 U=09)	2 (28.57)	1 (14.28)	1 (14.28)	3 (42.85)	4 (44.45)	1 (11.12)	1 (11.12)	3 (33.34)	6 (37.50)	2 (12.50)	2 (12.50)	6 (37.50)

1-Always (6-7 days /week), 2-Often (4-5 days/week), 3-Sometimes(2-3 days/week), 4-Rarely (0-1 days/week), R-rural, U-urban
Values in the parenthesis indicate percentage

%). Majority of rural children (80.80 %) drank tea compared to urban children (76.19 %) for breakfast. Milk was the next beverage consumed by 23.57 per cent (only beverage) and 5.88 per cent (with solid food) of pre-schoolers. When beverage was consumed alone nearly 17 per cent of children consumed horlicks, bournvita or complain, the percentages being higher in urban than rural. Around 75 per cent of children (n=425) were in the habit of consuming solid food along with beverage. A total of 140 pre-school children out of 565 (25 %) consumed only beverage in the morning for breakfast, among them more than 40 per cent of children (44.29 %) consumed only tea. Approximately 25 per cent of children began the day without eating a solid meal which includes 41 per cent of rural and 59 per cent of urban wards. Tea seemed to be the popular beverage consumed by both rural and urban children (Table 3). Horlicks, bournvita and complan were the common additional foods consumed as a flavouring agent with milk, the proportion being higher in urban than rural children. Senanayake and Parakramadas (2008) reported on waking up the first food consumed by Colombo children of 4-12 years age was a beverage and most frequently consumed items were tea with milk (70 %), full cream milk (16 %) and plain tea (4 %). Lazzeri *et al*. (2006) in Italy reported milk to be the most popular beverage consumed by the children of eight to nine year

Table 2 : Breakfast items consumed by pre-school children **(n=565)**

Items	Rural (n=250)	Urban(n=315)	Total
Idli	215 (86.00)	264 (83.81)	479 (84.78)
Upma	210 (84.00)	207 (65.71)	417 (73.81)
Biscuits	210 (84.00)	309 (98.10)	519 (91.86)
Paddu	207 (82.80)	214 (67.94)	421 (74.51)
Avalakki	202 (80.80)	211 (66.98)	413 (73.10)
Dosa	192 (76.80)	286 (90.79)	478 (84.60)
Chitranna	183 (73.20)	163 (51.75)	346 (61.24)
Chapati	163 (65.20)	195 (61.90)	358 (63.36)
Palav	150 (60.00)	177 (56.19)	327 (57.88)
Rice	150 (60.00)	107 (33.97)	257 (45.49)
Jowar *roti*	148 (59.20)	132 (41.90)	280 (49.56)
Puffed rice	121 (48.00)	148 (42.85)	269 (47.61)
Puri	103 (41.20)	176 (55.87)	279 (49.38)
Thalipatti	83 (33.20)	163 (51.75)	246 (43.54)
Bread	80 (32.00)	116 (36.83)	196 (34.69)
Vada	67 (26.80)	113 (35.87)	180 (31.86)
Kanda bajji	65 (26.00)	96 (30.47)	161 (28.49)
Uttappa	65 (26.00)	220 (69.84)	285 (50.44)
Puliyogare	58 (23.20)	221 (70.16)	279 (49.38)
Noodles	87 (34.80)	72 (22.86)	159 (28.14)

Note: Multiple answers are given by the respondents
Values in the parentheses indicates percentage

Table 3: Beverages consumed with breakfast **(n=565)**

Beverages	Only beverages			Beverages with other foods			Total		
	Rural (n=58)	Urban (n=82)	Total (n=140)	Rural (n=192)	Urban (n=233)	Total (n=425)	Rural (n=250)	Urban (n=315)	Total
Tea	28 (48.28)	34(41.46)	62(44.29)	174(90.63)	206(88.41)	380(89.41)	202(80.80)	240(76.19)	442(78.23)
Milk	15(25.86)	18(21.95)	33(23.57)	12(6.25)	13(5.58)	25(5.88)	27(10.80)	31(9.84)	58(10.27)
Coffee	8(13.79)	13(15.85)	21(15.00)	6(3.13)	14(6.01)	20(4.71)	14(5.60))	27(8.57)	41(7.26)
Horlicks	5(8.62)	9(10.98)	14(10.00)	-	-		5(2.00)	9(2.86)	14(2.48)
Bournvita	2(3.45)	7(8.54)	9(6.43)	-	-		2(0.80)	7(2.22)	9(1.59)
Complan	-	1(1.22)	1(0.71)	-	-		-	1(0.32)	1(0.18)

Values in the parentheses indicates percentage

old followed by coffee, tea and fruit juices. Chitra and Reddy (2006) reported coffee, tea, and fruit juice were the commonly consumed beverages. At this early age consumption of tea needs to be discouraged as it may influence availability of micronutrients.

It was observed that approximately 25 per cent of rural and 31 per cent of urban children consumed fruits for breakfast either alone or before and after solid food. Correspondingly 75 per cent rural and 69 per cent urban children did not consume any fruits for breakfast (Table 4). Among the children of rural locality banana and guava was favored by eight per cent each followed by sapota (4.80 %) and apple (3.20 %). Whereas in urban locality banana (8.57 %) followed by apple (6.35 %) were consumed by the children. Irrespective of locality banana was the most favoured fruits for breakfast by 8.32 per cent of pre-school children. Nearly equal per cent of them consumed apple (4.96 %) and guava (4.78 %), while least per cent of children reported to consume pomegranate (1.06 %) for breakfast. Since, fruits seasoned consumption varies widely and banana is all season fruit, it is commonly consumed by many children.

Table 5 presents the breakfast items liked by the pre-school children. One third of rural children liked *Paddu* (76.80 %) followed by *Dosa* (68.80 %) and urban children liked to eat biscuits (75.20 %) followed by *Paddu* (66.00%). Preferences for *Avalakki* (51.60 %), puffed rice (38 %), bread *(*40 %), *Kandabajji* (34.80 %), rice (28.80 %), noodles (48.0 %), *Puliyogare* (27.20 %), *Idli* (58.0 %) and *Puri* (37.60 %) was higher among urban

Table 4 : Fruits consumed at breakfast by the pre-school children **(n=565)**

Fruits	Rural (n=250)		Urban (n=315)		Total	
	n	%	n	%	n	%
Banana	20	8.00	27	8.57	47	8.32
Apple	8	3.20	20	6.35	28	4.96
Guava	20	8.00	7	2.22	27	4.78
Orange	5	2.00	13	4.13	18	3.19
Grapes	7	2.80	6	1.90	13	2.30
Sapota	12	4.80	3	0.95	15	2.65
Pomegranate	5	2.00	1	0.32	6	1.06
No fruits	173	69.20	238	75.56	411	72.74

Table 5: Breakfast items liked by pre-school children **(n=565)**

Items	Rural (n=250)		Urban (n=250)		Total	
	n	%	n	%	n	%
Paddu	192	76.80	165	66.00	357	71.40
Biscuits	158	63.20	188	75.20	346	69.20
Dosa	172	68.80	133	53.20	305	61.00
Avalakki	105	42.00	129	51.60	234	46.80
Puffed rice	86	34.40	95	38.00	181	36.20
Bread	77	30.80	100	40.00	177	35.40
Idli	32	12.80	145	58.00	177	35.40
Noodles	55	22.00	120	48.00	175	35.00
Pulav	85	34.00	78	31.20	163	32.60
Kanda bajji	67	26.80	87	34.80	154	30.80
Upma	97	38.80	54	21.60	151	30.20
Rice	65	26.00	72	28.80	137	27.40
Puri	32	12.80	94	37.60	126	25.20
Uttappa	72	28.80	53	21.20	125	25.00
Puliogare	48	19.20	68	27.20	116	23.20
Chapati	59	23.60	42	16.80	101	20.20
Jowar *roti*	51	20.40	32	12.80	83	16.60

Note: Multiple answers are given by the respondents

Table 6 : Breakfast items disliked items by the children **(n=565)**

Items	Rural (n=250)		Urban(n=250)		Total	
	n	%	n	%	n	%
Upma	53	21.20	77	30.80	130	26.00
Puri	72	28.80	53	21.20	125	25.00
Jowar *roti*	41	16.40	63	25.20	104	20.80
Dosa	34	13.60	51	20.40	85	17.00
Chapati	39	15.60	45	18.00	84	16.80
Avalakki	42	16.80	37	14.80	79	15.80
Uttappa	41	16.40	37	14.80	78	15.60
Puffed rice	40	16.00	32	12.80	72	14.40
Rice	35	14.00	30	12.00	65	13.00
Bread	42	16.80	21	8.40	63	12.60
Idli	29	11.60	32	12.80	61	12.20
Kanda bajji	35	14.00	22	8.80	57	11.40
Puliogare	34	13.60	23	9.20	57	11.40
Noodles	27	10.80	29	11.60	56	11.20
Pulav	23	9.20	29	11.60	52	10.40
Paddu	21	8.40	24	9.60	45	9.00
Biscuits	16	6.40	11	4.40	27	5.40

Note: Multiple answers are given by the respondents

Table 7: Place and pattern of eating breakfast by the pre-school children **(n=565)**

Days	Place	Rural (n=250)			Urban (n=315)		
		Girls (n=121)	Boys (n=129)	Total (n=250)	Girls (n=184)	Boys (n=131)	Total (n=315)
Week days	Home	121(100.0)	129(100.0)	250(100.0)	181(98.37)	130(99.24)	311(98.73)
	Outside home	-	-	-	3(1.63)	1(0.76)	4(1.27)
Holidays	Home	114(94.21)	125(96.90)	239(95.60)	121(65.76)	86(65.65)	207(65.71)
	Outside home	7(5.79)	4(3.10)	11(4.40)	63(34.24)	45(34.35)	108(34.29)
Eating pattern							
Week days	Alone	47(38.84)	47(36.43)	94(37.60)	92(76.03)	60(46.51)	152(60.80)
	With family members	82(67.77)	74(57.36)	156(62.40)	92(76.03)	71(55.04)	163(65.20)
Holidays	Alone	18(9.78)	24(18.32)	42(13.33)	35(19.02)	24(18.32)	59(18.73)
	With family members	111(60.33)	97(74.05)	208(66.03)	149(80.98)	107(81.68)	256(81.27)

Table 8 : Time taken to consume breakfast by the pre-school children **(n=565)**

Time (minutes)	Rural (250)											
	Week days						Holidays					
	Girls		Boys		Total		Girls		Boys		Total	
	n	%	n	%	n	%	n	%	n	%	n	%
5-10	8	6.20	7	5.79	15	6.00	8	6.20	3	2.48	11	4.40
10-20	84	65.12	78	64.46	162	64.80	67	51.94	65	53.72	132	52.80
20-30	30	23.26	30	24.79	60	24.00	41	31.78	41	33.88	82	32.80
30-40	6	4.65	5	4.13	11	4.40	12	9.30	11	9.09	23	9.20
40-50	1	0.78	1	0.83	2	0.80	1	0.78	1	0.83	2	0.80
Urban (315)												
5-10	13	7.07	14	10.69	27	8.57	8	4.35	10	7.63	18	5.71
10-20	93	50.54	85	64.89	178	56.51	78	42.39	55	41.98	133	42.22
20-30	45	24.46	34	25.95	79	25.08	59	32.07	40	30.53	99	31.43
30-40	14	7.61	10	7.63	24	7.62	31	16.85	23	17.56	54	17.14
40-50	3	1.63	3	2.29	6	1.90	6	3.26	3	2.29	9	2.86
More than one hour	1	0.54	-	0.00	1	0.32	2	1.09	-	-	2	0.63

pre-school children compared to rural counterparts (42, 34.40, 30.80, 26.80, 26, 22, 19.20, 12.80 % and 12.80 %, respectively). Irrespective of locality majority of children liked *Paddu* (71.40%) followed by biscuits (69.20 %), and *Dosa* (61.0 %).

Breakfast items disliked by the children are presented in Table 6. Irrespective of locality, *Upma* was disliked by 26 per cent children followed by *Puri* (25.0 %) and *Jowar roti* (20.80 %). Nearly equal per cent of them did not like *Chapati* (16.80 %), *Avalakki* (15.80 %) and *Uttappa* (15.60 %) for breakfast. Very low per cent of children 6.40 per cent (rural) and 4.40 per cent (urban), respectively disliked biscuits. Among urban subjects *Upma* was ranked first among disliked breakfast items (30.80 %). Study reveals that *Puri* was disliked by higher per cent of rural children (28.80 %) compared to urban counterparts (21.20 %). When rural and urban respondents were compared, higher per cent of rural pre-school children did not like bread (16.80 %), *Avalakki* (16.80 %), *Uttappa*(16.40 %), puffed rice (16.0 %), *Kandabajji* (14.0 %), rice (14.0 %), *Puiylogare* (13.60 %) and biscuits (6.40 %) compared to urban counterparts (8.40, 14.80, 14.80, 12.80, 8.80, 12, 9.20, and 4.40 %, respectively).

All the children belong to rural locality consumed breakfast at home on week days and no one has had breakfast outside the home on week days. Whereas, in urban locality few children (1.27%)consumed breakfast outside home on week days. On holidays, percentage of children consuming breakfast outside the home has increased. Children of rural and urban locality (38.84 and 60.80 %, respectively) consume breakfast alone on week days and the percentage of children consume breakfast with family members on holidays has increased (Table 7). It was obvious that parents of pre-school children were in a hurry to go and attend their works on weekdays, leading to the consumption of breakfast by the children at home and alone (Table 7). Nearly 82 per cent of pre-school children consumed breakfast at home on weekdays, this includes, 99 per cent from urban and 66 per cent from rural area. Around 87 per cent of the children in the study conducted by Intifuli and Lartey (2014) consumed breakfast at home on schooldays. As children tend toconsume food slowly by playing around, this results in increased time taken to consume breakfast. In the present study about 65 per cent rural and 56 per cent urban pre-school children consumed their breakfast within 10-20 minutes (Table 8). Holidays are relaxing time for parents and others in the family as well as the children. Naturally, this leads to consumption of morning meal at a later time of the day with family members (Table 7). Similar results were found by Vanelli *et al.* (2005) in Italy among 11to 14 year children. Leisurely consuming food is believed to lead to proper chewing of food leading to better digestion and absorption of nutrients.

Conclusion:

73.10 per cent of children consumed breakfast regularly (>5 times a week) while remaining 26.90 per cent of them did not consume regularly (<4 times a week). The study reports that more than 50 per cent of rural (54.00 %) and urban (53.33 %) children ate only foods of his or her choice of food for breakfast. Locality among the food items, biscuits were consumed by higher per cent (91.86 %) of the study children. Irrespective of locality, tea (78.23 %) was found to be the most popular beverage among pre-schoolers and was consumed either alone (44.29 %) or with solid food (89.11 %).that approximately 25 per cent of rural and 31 per cent of urban children consumed fruits for breakfast either alone or before and after solid food. Fermented products are liked by the children. Percentage of children consuming breakfast on holidays with family members and outside the home with more time is higher compared to weekdays.

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