

## EFFECT OF EMPLOYMENT STATUS OF MOTHER ON THE NUTRITIONAL STATUS OF THE PRE-SCHOOL CHILDREN AGED 2 TO 5 YEARS

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**Abstracts: Background & Objectives:** To compare the nutritional status of the children of employed and unemployed women. **Methods:** Children aged between 2-5 years from the pre-schools of Ajmer city, 80 children of employed women and 80 of un-employed women were selected through simple random sampling method. The socio-economic data was collected through questionnaires. Anthropometrical measurements of the child like current height, weight and mid arm circumference were obtained by using standardized tools. **Statistical Analysis:** For each anthropometrical data, a separate table was created in a relational basis in MS Excel and 'WHO Anthro' software was used to analyse the information for the nutritional status. **Results:** The parameters of nutritional status for children of unemployed and employed mother's shows that prevalence of underweight, stunting, wasting and thinness were more in children of employed mother's in comparison to un-employed mothers. Mid Upper Arm Circumference below normal were high amongst the children of employed compared to unemployed. **Conclusions:** With our observation & discussion it is concluded that the nutritional anthropometrical parameters were better in un-employed mother's children in comparison to employed mother's children.

**Key Words:** Nutritional status, Employed mothers, Un-employed mothers, Pre-school children, Anthropometry.

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### Introduction:

Although women in developing countries spend great amounts of time in either subsistence labor, wage labor, or both, and carry the major responsibilities for domestic work and child care<sup>1</sup>, a study which have considered the impact of maternal work on child nutritional status have produced inconsistent findings. In part this is because the process of infant and child feeding can significantly affect the whole household as well as being influenced by the behavioural patterns and economic circumstances associated with maternal employment<sup>2</sup>, and the extent to which the health and nutritional status of the caregiver influences care giving capacity<sup>3</sup>. Number of studies found, there were a link between childhood obesity and mothers who work. Most studies showed higher prevalence of childhood obesity were among employed mothers compared to unemployed mothers. This was supported by a study<sup>4</sup>, who revealed that full-time employment mothers had higher probability of the child being overweight. Whereas, another study<sup>5</sup> claimed that increased length of working hours were found to be associated with an increase in their child's BMI. As more and more women are being forced to take up

work in the unorganized sector, the real challenge is to ensure that the laws and schemes (including child care) that exist (at least on paper) for the women workers in the organized sector are extended to this vast majority. In the past, the older siblings (or) grandparents were usually available to take care of the young infants while the mother was employed; but because of the social change and the modernization, the extended family has become less common. All these factors may contribute to a poor child care.

### Material and Methods:

This was a cross sectional descriptive study which was carried out in 6 randomly selected pre-school of Ajmer city, Rajasthan, India after obtaining the appropriate ethical clearance.

### Inclusion Criteria:

There was two study groups, first group (n=80) of children 2-5 years whose mothers were at least 10<sup>th</sup> standard pass/appeared, aged between 18-40 years, engaged in work at least 6 hours per day outside home for at least last 6 months regularly. Second group (n=80) of children taken care by his/her own un-employed mother.

### Exclusion Criteria:

- Women who were Pregnant and lactating.

- Women belonging to joint family.
- Women having major medical disorders like tuberculosis.
- Mothers whose children attended by baby sitter, siblings registered in same pre-school
- Children having medical disorders such as asthma, congenital heart diseases, DM etc.

**Assessment Methods:**

The six schools finalized for this study were primarily based on the cooperation from the principal and agreeability for conducting the study. Informal consent from the mothers was taken by explaining the purpose and objectives of the study. Data was collected using structured demographic questionnaire administered to the mothers to assess the demographic status and structured questionnaire to assess the Growth among children of working and non-working mothers whose children were in preschool. There were no invasive procedures done.

The following data was collected on all the children:

- Socio-economic data
- Anthropometric data (Height, Weight, Mid Upper Arm circumference)

Information on the socio-economic profile was collected using a structured questionnaire on information regarding age, sex, religion, family members, parent's education and occupation, per month income etc. Information on date of birth of children was verified from the school records. Some socio economic information like income, occupation of parents was also available in school records. Anthropometric data was collected using WHO standard. Weight was taken by bathroom scale and height by Tailoring tape. Paired data of these children were used for studying dynamics of growth and weight trends in the study population. The reference data used were taken from WHO 2006-07 data set for growth parameters in children. Age in months was used for converting BMI, weight and height to Z score as WHO references. The cohort was divided into various sub groups for further analysis. Z score  $<-2$  SD for weight for age was considered underweight, Z score  $<-2$ SD for height for age was termed stunting, Z score  $<-2$  SD for weight for height was considered wasting, Z score  $>+2.0$  SD for weight for

height was considered overweight, and Z score  $<-2$ SD for BMI was termed as thinness. The data was entered into Microsoft excel spread sheet and then subjected to appropriate statistical analysis using Microsoft excel data analysis package for calculating mean and standard deviation. The entered data of excel was imported into and Z scores were derived by Anthro software package of WHO and their means were compared. Unpaired t-test was used for comparing individual group. These tests were used for comparing weight transition among subgroups. Significance was assigned by p value.

**Result:**

Two hundred and fifty two subjects completed and returned the questionnaires. Data for 92 of the 252 participants were excluded from this study because some of them were reported staying with grandparents and some were having diseases such as kidney disease, asthma and other exclusion criteria. The nutritional status of children whose mothers were working for earnings was compared to those of non-working mothers using t-tests. These results were found while controlling the confounding variables of maternal differentiation. The nutritional status in almost all the category using WHO growth standard, unemployed mothers' children lead on employed mothers' children.

The mean weight of the employed mother's children and un-employed mother's children were 13.58kg & 14.25kg respectively (P value=0.017). The mean height of the employed mother's children and un-employed mother's children were 94.6cm & 96.84cm respectively (P value=0.012). The mean BMI of the employed mother's children and un-employed mother's children were 15.23kg/m<sup>2</sup> & 15.18kg/m<sup>2</sup> respectively (P value=0.845). The mean MUAC of the employed mother's children and un-employed mother's children were 15.49cm & 15.63cm respectively (P value=0.453).

Table 1: Various mean &amp; deviations of characteristics among employed and unemployed group

Characteristics of children	Age group (months)	Employed group			Un-employed group			t-Test
		N	mean	SD <sup>‡</sup>	N	Mean	SD <sup>‡</sup>	P value
HEIGHT (cm)	24-60	80	94.6	5.32	80	96.84	5.81	0.012
	24-35	46	91.68	4.20	35	93.21	5.19	0.147
	36-47	23	97.37	3.91	32	97.52	3.08	0.874
	48-60	11	100.8	3.18	13	104.9	3.12	0.004
WEIGHT (Kg)	24-60	80	13.58	1.61	80	14.25	1.88	0.017
	24-35	46	13.1	1.42	35	13.29	1.53	0.566
	36-47	23	13.7	1.46	32	14.37	1.32	0.081
	48-60	11	15.3	1.41	13	16.53	1.84	0.084
BMI* (kg/m <sup>2</sup> )	24-60	80	15.23	1.84	80	15.18	1.35	0.845
	24-35	46	15.7	2.06	35	15.30	1.34	0.321
	36-47	23	14.4	1.12	32	15.12	1.25	0.032
	48-60	11	15.1	1.48	13	15.00	1.43	0.868
MUAC <sup>†</sup> (cm)	24-60	80	15.49	1.24	80	15.63	1.11	0.453
	24-35	46	15.36	1.30	35	15.33	0.96	0.909
	36-47	23	15.41	0.94	32	15.7	1.11	0.314
	48-60	11	16.21	1.25	13	16.34	1.17	0.795

\* Body Mass Index, † Mid Upper Arm Circumference, ‡ Standard Deviation

Table 2: Study results

Particulars		Prevalence among study group			
		Employed mother (N=80)		Un-employed mother (N=80)	
		N	%	n	%
Underweight (WAZ* < -2.0)	Total	2	2.5	0	0
	Boys	1	2.2	0	0
	Girls	1	2.9	0	0
Stunting (HAZ <sup>†</sup> < 2.0)	Total	4	5	0	0
	Boys	4	8.9	0	0
	Girls	0	0	0	0
Wasting (WHZ <sup>‡</sup> < -2.0)	Total	6	7.5	4	5
	Boys	2	4.4	2	4.9
	Girls	4	11.4	2	5.1
Overweight (WHZ > +2.0)	Total	5	6.3	0	0
	Boys	4	8.9	0	0
	Girls	1	2.9	0	0
BMI (< -2.0 SD)	Total	9	11.3	5	6.3

	<b>Boys</b>	4	8.9	1	2.4
	<b>Girls</b>	5	14.3	4	10.3
<b>MUAC (&lt;-2.0 SD)</b>	<b>Total</b>	2	2.5	0	0
	<b>Boys</b>	0	0	0	0
	<b>Girls</b>	2	5.7	0	0

\*Weight for Age, †Height for Age, ‡Weight for Height

### Discussion:

In this study analysis of data on changes in prevalence of undernutrition as assessed by height for age, weight for age and BMI for age, weight for height and mid upper arm circumference revealed some interesting findings. Indian infants begin their life with a lower in weight, height and BMI. Young children need to be fed 5-6 times a day to meet their food requirements from the habitual household diets with low calorie density, and this is hampered when the mother is employed. Low BMI for age, weight for age, stunting, mid upper arm circumference and wasting rates were more in employed mother's children reflecting the adverse impact of employment. The higher decline in the WAZ and HAZ, WHZ and MUACZ between girls is due to less care and feeding to girl child especially in Indian orthodox families. The observed changes in undernutrition rates as assessed by weight, height and BMI for age can be explained on the basis of the response of these indices to chronic energy deficiency. Weight for age is the most widely used indicator for assessment of nutritional status because of ease of measurement. Children can be underweight because they are stunted, or wasted or stunted and wasted. Underweight cannot distinguish between current or past or past and current energy deficit. Stunting is an index of cumulative past energy deficit but does not reflect current energy status. BMI is an index of current energy deficit because it is computed from current weight and current height of children. As low BMI is the indicator of current energy deficit, early detection of low BMI for age and expeditious correction of it is likely to be the most effective intervention for preventing stunting. A study<sup>6</sup> suggested that in many developing countries, the poor women had multiple roles, and that often their time constraints were so severe, that their participation in the income-generating activities resulted in a reduced childcare time, which in turn affected the children's health. Another<sup>7</sup> study found

that the nutritional status of the children of the working mothers was poorer than that of the children whose mothers stayed at home. The effect

of the mother's occupation on the child's nutritional status was complicated, though it could be expected that the working mothers would be better able to provide for their families. According to a study<sup>8</sup>, 75% of the working mothers had some help which was available for childcare. However, another<sup>9</sup>, suggested that the childcare which was given by the mother was superior to that which was given by any other family member. A study<sup>10</sup> found that the supplementary feeding at the day care centres improved the children's nutrition, while another<sup>11</sup>, observed that the supplementary feeding at the day care centres had no effect on the children's growth. The Anganwadi centres have to be strengthened, to provide nutrition and also care for the minor illnesses, so that the children can develop well. Another study<sup>12</sup> observed that the improvements in the wage income translated into improvements in the child nutrition status more readily in the households where the women were employed. Educated, nutritionally strong and employed mothers who had control over their household resources could take care of their children more effectively, which was reflected in the better nutritional status of their children. Finally in this study, the children of the unemployed mothers weighed significantly more and stood significantly taller than the children of the employed mothers. In a study<sup>13</sup>, found a similar positive impact. Another<sup>14</sup> study also found that the children of the non-working mothers had significantly a greater height and weight. Similarly we found that all other parameters i.e. WAZ, HAZ, WHZ, BMI and MUACZ were better in un-employed mother's children.

### Conclusion:

However, in this study, with our observation & discussion it is concluded that the children of the

working women were both under-weight and also shorter/stunted than those of the non-working women. Number of wasting and overweight was also higher in employed group as compare to un-employed. The BMI and MUACZ were also compromised in employed group as compared to un-employed. So we found that all the parameters i.e. WAZ, HAZ, WHZ, BMI and MUACZ were better in un-employed mother's children. Further study needed in this regard. We recommend that the children of the employed mothers should be better take care at their working place as well as home. The government as well as private working centre's should implement their policies (day care centres) properly.

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#### References:

- Coreil, 1991. Maternal Time Allocation in Relation to Kind and Domain of Primary Health Care. *Medical Anthropology Quarterly* 5(3):231-235.
- Behrman Jeer. R and Anil. B. Deolalikar (1987). Will developing country nutrition improve with income? A case study from rural India, *Journal of Political Economy*, Vol.95, pp 492-507.
- Winkvist, A. 1995. Health and nutrition status of the caregiver: Effect on caregiving capacity. *Food and Nutrition Bulletin* 16 (4): 389-397.
- Araneo, Jackie (2008). "The Effect of Maternal Employment on Childhood Obesity in the United States." Senior Thesis, Princeton University.
- Morrissey et al. (2011). Maternal Employment, Work Schedules, and Children's Body Mass Index, *Child Development Special Issue: Raising Healthy Children Volume 82, Issue 1*, pp 66-81 Jan/Feb 2011.
- Nakahara S, Poudel KC, Lopchan M, Ichikawa M, Tandukar KP, Jimba M, et al. The availability of the childcare support and the nutritional status of the children of non-working and working mothers in urban Nepal. *American Journal of Human Biology*. 2006;18(2):169–81. March/April. [PubMed]
- Powell CA, Grantham-McGregor S, (1985). The ecology of the nutritional status and the development in young children in Kingston, Jamaica. *The American Journal of Clinical Nutrition*. 1985;41:1322–31.[PubMed].
- Bhangi MS, Thimmayamma BVS. The impact of the women's work on the maternal and the child nutrition, *Ecology of Food and Nutrition*. 2000;39(1):13–31.
- Jain SCM, Jain AK. The determinants of the regional variations in the infant mortality in rural India. *Population studies*. 1985;39(3):407–24.
- Silva EMK, Miranda CT, Puccini RF, Nobrega FJ. A day care center as an institution for the health promotion among needy children. An analytical study. Sao Paulo, Brazil, *Public Health*. 2000;114:385–88.[PubMed]
- Gershoff SN, Mc Gandy RB, Nondasuta A, Tantiwongse P. The effect of calories, nutrient supplements and health interventions on the growth of preschool children. *AmjClinNutr*. 1988; 48:1214–18. *Nutrition studies in Thailand*. [PubMed]
- Kumar S. (1977). The role of the household economy in determining the child nutrition at low income levels: A case study of Kerala. 1977. Occasional paper No. 95, Dept of Agricultural economics.
- Tucker K, Sanjur D. The maternal employment and the child nutrition in Panama. *Social Science and Medicine*. 1988;26(6):605–12. [PubMed]
- Toyama N, Wakai S, Nakamura Y, Arifin A. The mothers' working status and the nutritional status of the children who were under the age of 5 in an urban low-income community, in Surabaya, Indonesia. *J Trop Pediatr*. 2001;47(3):179–81. [PubMed]

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