

# THE IMPACT OF MATERNAL EMPLOYMENT ON HEALTH OF CHILDREN UNDER TWO YEARS OLD

By

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## Abstract

**Introduction:** Women's labor force participation has risen around the globe in the past few decades, maternal employment can affect children's well-being through multiple channels, including income effects, decisions about health inputs, and time spent with children. Overall, women's employment affects child health widely. **Aim of work:** To study the impact of maternal employment on breastfeeding practice, nutritional status, and motor development of children under two years old. **Materials and methods:** An analytical cross-sectional study was conducted during the period from May 2018 to December 2019, on 400 children under two years old who were attending a Pediatrics Clinic or Vaccination Unit at the Primary Health Care Centers at Shebin Alkom district, Menoufia governorate. The children who fulfilled inclusion criteria were involved in the study, and their mothers were interviewed using an interview questionnaire. Physical examination and complete blood count were done for children. **Results:** Working mothers represented 25% of the studied sample. There were statistically significant differences between employed and unemployed mothers as regards education, income, and socioeconomic standard. There were statistically significant differences between the studied groups in breastfeeding practices; exclusive breastfeeding, frequency and duration of breastfeeding were lower among employed mothers, the rate of hospitalization and different infections, i.e., gastroenteritis, otitis media, and repeated throat infection, were significantly higher among children of employed mothers compared to children of unemployed mothers (p-value <0.05). There was no statistically significant difference between children of employed and unemployed mothers as regard motor development, dentation, weight for age, length for age, and weight for length,

while anemia was significantly higher among children of unemployed compared to employed mothers. **Conclusion and recommendations:** Maternal employment has a negative impact on breastfeeding practice and increase infectious diseases occurrence and hospitalization rate among children. The study showed that there was no effect on motor development and nutrition status of the children. The government has to encourage the implementation of national legislations, which mandated the employers to provide their employees with childcare centers and nurseries near to the workplace.

**Keywords:** Maternal employment, Child health, Breastfeeding and Nutritional status.

### Introduction

As women participation in the labor market has been rising globally, a growing literature has emerged to explore whether maternal employment is a determinant of child health (Rashad and Sharaf, 2019). Women not only have become engaged in market work, but the nature of employment has also evolved as women have shifted from agriculture into manufacturing and services. In addition, women have entered into non-traditional occupations that were formerly open only to men (Acharya, 2008). Globally, Women's labor force participation rate is 48.5% (ILO, 2018). In Egypt, women participate in 22.9% of the total workforce (EDHS, 2015). The direction and magnitude of maternal work's effect on child health are theoretically ambiguous. The most evident mechanism through which maternal employment might positively affect children is through an increase in family income (Currie and Lin, 2007). On the other hand; maternal

employment may result in a loss of childcare time as working women have less time to breastfeed their children, preparing rich-nutrition food and take them regularly to health care providers (Majbouri, 2016).

Many factors may be involved in the relationship between breastfeeding and employment of mother such as the timing of return to work, the number of hours worked per week, the availability of a suitable and convenient childcare facility, the location of the work and lack of support from employers, family members and colleagues (Su-Ying, 2013). Women's employment was associated with a decline in the duration of breastfeeding (Kimbero, 2006). The issue regarding whether maternal employment in the labor market results in net benefits for children's nutritional status remains controversial. In closing, developing country studies have found maternal employment to have positive, negative, and no substantial impacts on children's nutritional

status. Differences across studies in methodology, social context, and the types of work that women perform help to explain this lack of consensus (Meyer, 2016). Predicting the direction of the relationship between maternal employment and child nutritional status is not apparent (Rashad and Sharaf, 2019). There are still many unanswered questions about the impact of early maternal employment on children's development. The most important are motor and cognitive development and whether maternal employment in the first year of life has any lasting effects on children's cognitive outcomes (Ruhm, 2008). Some of the concern about changes in children's health status when mothers enter the labor market arises from the change in childcare situations, especially when children enter care centers. These concerns include arguments that non-parental care introduces a higher risk that a child may be exposed to infectious diseases or become injured (Baker et al., 2008).

### **Aim of work**

This study aims to determine the impact of maternal employment on breastfeeding practice, nutritional status and motor development of children under two years old.

### **Materials and methods**

**Study design:** It is an analytical cross-sectional study

**Place and duration of the study:** The study was carried out in primary health care units in Shebin Alkom district (Menoufia Governorate) during the period from May 2018 to December 2019.

Shebin Alkom district has 12 Primary Health Care Centers and Units distributed at Shebin Alkom city and the surrounding villages. The targeted population was selected from one urban and two rural health centers using simple random sampling. Shebin Alkom city include two Primary Health Care Centers, one selected (Maternal and Child Health center Bahary) by simple random sample as an urban unit. From ten rural health centers, two rural Primary Health Care Centers (El-batanoun and Shobrabas) were selected by simple random sample.

### **Study sample**

**Sample size:** It was calculated by using Epi Info (2000) program at 95 % confidence intervals of and 80% power of the study, out of the total number of children under two years old in Shebin Al-Kom district were 35200. The

sample size was calculated to be 380 children, by adding 10% to total sample size calculated, the final sample size was 420 participants, the response rate was 95.2 %, so the total studied children was 400 child.

### **Inclusion Criteria:**

- Age up to 24 months
- Both sexes were included.
- Apparently healthy children living in Shebin Alkom districts, Menoufia Governorate,

### **Exclusion Criteria:**

- History of prematurity and malnutrition.
- Children with congenital anomalies.

### **Study methods:**

All the participants were subjected to:

#### **1- A pre-designed interviewed questionnaire** which included:

- a- Age, sex, and residence of the child.
- b- Educational and occupational status of the parents.
- c- History of breastfeeding, duration of breastfeeding and weaning practices
- d- Child medical history

e- The questionnaire included items related to motor developmental milestones of the children as age of crawling, sitting, walking and teething etc..... .

f- The socioeconomic standard was assessed through their education, occupation, income, the number of individuals per room, type of housing, material possessions, etc..... according to (El-Gilany et al., 2012).

### **2- Physical examination:**

Each child participated in the study was examined, and the anthropometric measures were taken, including weight that was a record by using an electronic weighing scale; the length of the child and head circumference was measured while the child was lying. Nutrition assessment was done by Z score, which is a system that expresses the anthropometric value as a number of standard deviations or Z-scores below or above the reference means or median value.

The following growth indicators were used to assess a child nutritional status (WHO, 2008):

- g- a- Length-for-Age Z score (HAZ) which was interpreted as : between

2SD to -2SD= Normal length, below -2SD =Stunted and below -3SD = Severely stunted

h- b- Weight-for-Age Z score (WAZ) which was interpreted as: between 2SD to -2SD= Normal weight, below -2SD =Underweight and below -3SD= Severely underweight

i- c- Weight-for-Length (WLZ) was interpreted as: above 3SD= Obese, above 2SD= Overweight, above 1SD = Possible risk of overweight, below 1SD to and above -2SD= Normal weight, below -2SD= Wasted and below -3SD =Severely wasted.

Motor development was assessed by milestone Motor Development Chart.

### **3- Investigation:**

Complete blood count (CBC) was done for children between 6 and 59 months (generally referred to as under-fives), the threshold Hb level for being non-anemic is 11 (mg/dL) (WHO, 2011)

### **Consent**

Formal consent was taken from mothers before being enrolled and after an explanation of the aim, benefits of the study.

### **Ethical approval**

Medical Ethics Committee at Menoufia Faculty of Medicine approved the study protocol before starting.

### **Data management**

Data were collected, tabulated, statistically analyzed using an IBM personal computer with IBM Statistical Package of Social Science (SPSS) version 22 (SPSS Inc., Chicago, Illinois, USA). Quantitative data normality was tested using Shapiro-Wilk and Kolmogorov-Smirnov tests. Student's t-test was used for parametric data, and the Mann-Whitney test for non-parametric Chi-squared test ( $\chi^2$ ) was used to study the association between two qualitative variables, while Fisher's exact test for 2 x 2 tables when expected cell count of more than 25% of cases was less than 5. A p-value of <0.05 was considered statistically significant.

## Results

**Table (1): Comparison of demographic data between employed and unemployed mothers.**

Demographic data	Employed mothers No=100		Unemployed mothers No =300		Test of significance	p-value
	No	%	No	%		
<b>Age</b> Mean ±SD Range	29.23±3.82 20-38		28.68±4.33 19-38		t# 1.18	0.236
<b>Age of the husband</b> Mean ±SD Range	34.68±3.57 28-42		34.16±4.72 25-43		t# 1.15	0.248
<b>Age of the children in months</b> Mean ±SD Range	15.95±6.26 4-24		14.92±5.45 4-24		U## 1.69	0.091
<b>Sex of the children</b> Male Female	40 60	40 60	144 156	48 52	$\chi^2$ 1.93	0.164
<b>Residence</b> Urban Rural	60 40	60 40	172 128	57.4 42.6	$\chi^2$ 0.219	0.640
<b>Education</b> Low education High education	20 80	20 80	164 136	54.6 45.4	$\chi^2$ 36.29	<0.001**
<b>Husband's education</b> Low education High education	28 72	28 72	88 212	29.3 70.7	$\chi^2$ 0.06	0.799
<b>Husband's occupation</b> Unskilled workers Skilled workers Employees Professionals	4 28 56 12	4 28 56 12	28 124 132 16	9.3 41.3 44 5.3	$\chi^2$ 13.23	0.004*
<b>Number of children</b> 1-2 3-4 More than 4	68 32 0	68 32 0	180 112 8	60 37.3 2.7	$\chi^2$ 4.033	0.133
<b>Income</b> Not Sufficient Sufficient More than sufficient	36 40 24	36 40 24	128 156 16	42.6 52 5.4	$\chi^2$ 29.15	<0.001**
<b>Socioeconomic standard</b> Low Moderate High	24 52 24	24 52 24	116 170 14	38.7 56.7 4.6	$\chi^2$ 23.28	<0.001**

$\chi^2$  Chi-Square test

\*: Significant

# t= student t-test

\*\* : Highly significant

## U=Mann-Whitney test

Table 1 showed that there was statistically significant difference between employed and unemployed mothers as regards education, income, and socioeconomic standard (p-value <0.05)

**Table (2): Comparison of feeding practices between employed and unemployed mothers.**

	Employed mothers No=100		Unemployed mothers No =300		Test of	p-value
	No	%	No	%		
<b>Start breastfeeding directly after labor</b>					#FXT	
Yes	97	97	293	97.7	0.137	0.716
NO	3	3	7	2.3		
<b>Exclusive breastfeeding in the first six months (No=390)</b>					$\chi^2$	
Yes	32	32.9	190	64.8	30.16	
NO	65	67.1	103	35.2		
<b>Number of breastfeeding per day(No=390)</b>					$\chi^2$	
< five	36	37.1	54	18.4	15.29	
Five to eight	37	38.1	127	43.3		
> eight	24	24.8	112	38.2		
<b>Timing of breastfeeding (No=390)</b>					$\chi^2$	
Every 4 hours	22	22.7	55	18.8	9.63	<b>0.008*</b>
Every 6 hours	50	51.5	111	37.9		
When baby needs	25	25.8	127	43.3		
<b>Child's age at cessation of breastfeeding in months</b>					U##	
Mean $\pm$ SD	7.27 $\pm$ 2.84		13.82 $\pm$ 2.65		9.83	
Range	4-12		7-18			

$\chi^2$  Chi-Square test

# FXT=Fisher's exact test

## U=Mann-Whitney test

\*: Significant

\*\*: Highly significant

Table 2 showed that there was no statistically significant difference between employed and unemployed mothers as regards the start of breastfeeding after labor. There were statistically significant differences between employed and unemployed mothers in exclusive breastfeeding in the first six months of children's age, number of breastfeeding/day, and breastfeeding timing (p-value <0.05). Employed mothers stop breastfeeding earlier than unemployed mothers.

**Table (3): Children's medical history of employed and unemployed mothers.**

	Employed mothers No=100		Unemployed mothers No =300		$\chi^2$	p-value
	No	%	No	%		
<b>History of hospitalization</b>						
Yes	16	16	4	1.3	33.96	<0.001**
NO	84	84	296	98.7		
<b>History of gastroenteritis</b>						
Yes	45	45	44	14.7	39.89	<0.001**
NO	55	55	256	85.3		
<b>History repeated throat infection</b>						
Yes	64	64	100	33.3	29.15	<0.001**
NO	36	36	200	66.7		
<b>History of otitis media</b>						
Yes	20	20	32	10.7	5.77	0.016*
No	80	80	268	89.3		
<b>History of anemia</b>						
Yes	3	3	24	8	2.97	0.084
NO	97	97	276	92		

$\chi^2$  =Chi-Square test

\*: Significant

\*\* : Highly significant

Table 3 showed that the history of different infections and hospitalization rate were statistically significantly higher among children of employed mothers compared to children of unemployed mothers (p-value <0.05). Anemia was higher among children of unemployed mothers compared to children of employed mothers but not to a statistical significance level.

**Table (4): Comparison of children motor development and dentation between employed and unemployed mothers.**

	Employed mothers No=100		Unemployed mothers No =300		Test of significance	p-value
<b>Age of crawling</b>					#	
Mean ±SD	8.14±1.46		8.15±0.99		0.081	0.936
Range	5-10		5-11			
<b>Age of sitting</b>					#	
Mean ±SD	9.78±1.20		9.90±1.80		0.707	0.481
Range	7-12		7-12			
<b>Age of walking</b>					#	
Mean ±SD	12.92±1.77		12.89±1.83		0.123	0.902
Range	10-18		9-18			
<b>Age of dentation</b>					#	
Mean ±SD	8.07±2.49		7.54±1.75		1.80	0.074
Range	6-14		5-14			
	No	%	No	%		
<b>Motor development</b>					FXT##	
Normal	100	100	299	99.7	0.334	0.563
Delayed	0	0	1	0.3		
<b>Dentation</b>					$\chi^2$	
Normal	89	89	249	83	1.75	0.185
Delayed	11	11	51	17		

 $\chi^2$  =Chi-Square test

# t=students t-test

##FXT=Fishers exact test

Table 4 showed that there was no statistically significant difference between children of employed and unemployed mothers as regards age of crawling, sitting, walking and dentation ( p-value >0.05)

**Table (5): Comparison of nutritional status with a Z score of employed and unemployed mother's children.**

	Employed mothers No=100		Unemployed mothers No =300		$\chi^2$	p-value
	No	%	No	%		
<b>Weight for age</b>						
Normal weight	92	92	268	89.3	0.593	0.441
Underweight	8	8	32	10.7		
<b>Length for age</b>						
Normal length	96	96	287	95.7	0.020	0.886
Stunted	4	4	13	4.3		
<b>Weight for length</b>						
Obese +over weight +risk for overweight	8	8	8	2.6	5.91	0.062
Normal weight	90	90	282	94		
Wasted	2	2	10	3.3		
<b>Anemia</b>						
Yes	11	11	61	20.3	4.42	<b>0.035*</b>
NO	89	89	239	79.7		

$\chi^2$  =Chi-Square test

\*: Significant

Table 5 showed that there was no statistically significant difference between children of employed and unemployed mothers using Z score as regards weight for age, length for age and weight for length, while anemia was significantly higher among children of unemployed compared to employed mothers (p-value <0.05).

### Discussion

Two different mechanisms on the effects of mother work on children's health have been postulated; first mother's work increase family income, second, the time taken away from childcare when she goes to work. The first one is direct and positive the other is inverse and negative (Currie and Lin, 2007). The magnitude of maternal

work's effect on child health is still not clear. We did this study in a trial to clarify the impacts of mother's work on their child's health.

The current study showed that the percentage of working mothers of the studied group was 25% (Table 1). This result was in line with EDHS, 2015, which reported that women participate in 22.9% of the total workforce in Egypt.

The present study demonstrated that the educational level was statistically higher among employed compared to unemployed mothers (Table 1). This difference can be explained by the fact that women with better education had better work chance. This was in agreement with Carlijn et al., 2017, who reported that there is a link between women education and employment. Our study found that employed mothers had higher income and better socioeconomic standard than unemployed mothers (Table 1). This can be explained by that maternal employment increases family income and welfare. This finding comes in agreement with Rashad and Sharaf, 2019. The same findings were approved by Ying-ping et al., 2018 in their study on maternal employment and family socioeconomic status among Taiwanese families.

In the present study, we found that there was no statistically significant difference between employed and unemployed mothers as regards the start of breastfeeding after labor (Table 2). This result was in accordance with Tadesse et al., 2019 in their study on exclusive breastfeeding and maternal employment among mothers of infants from three to five months old in the

Fafan zone, Somali regional state of Ethiopia. Also Hawkins et al., 2007 detected the same results in their study on maternal employment and breastfeeding initiation: findings from the Millennium Cohort Study.

There were statistically significant differences between employed and unemployed mothers in exclusively breastfeeding (EBF) in first six months (Table 2) as 32% of employed mothers exclusively breastfeeding versus 56.9% of unemployed mothers this may be explained by the need of employed mothers to use additional types of feeding during their absence at work. This negative impact of maternal employment on EBF was found in different studies: Shaheen et al., 2018 in their study about the barriers to breastfeeding among women and the study done by Al-Sahab et al., 2010 on the prevalence and predictors of 6-month exclusive breastfeeding among Canadian women: a national survey.

The current study showed that there was a statistically significant difference in the number of breastfeeds/day, as 37.1% of employed mothers and 18.4% of unemployed mother's breastfed less than five times/day (Table 2). This result comes in accordance with Farahat et al.,

2007, who reported that 30 % and 11 % of employed and unemployed mothers' breastfed less than five times per day. There was a statistically significant difference as regards the age of children when cessation breastfeeding, where employed mothers stop breastfeeding earlier than unemployed mothers (Table 2). This result was consistent with Rivera-Pasquel et al., 2015 in their study about breast-feeding and maternal employment in Mexico and the study done by Cooklin, 2008 about maternal employment and breast feeding: longitudinal study of Australian children . These adverse effects of maternal employment on breastfeeding practices may be attributed to the lack of breastfeeding-friendly work environment, early return to work, and long work hours, which lead to infrequent or widely spaced feeding that will eventually lead to drop of the amount of milk produced and finally cessation of lactation.

The present study revealed that the history of different infectious diseases was significantly higher among children of employed mothers compared to children of unemployed (Table 3). This may be because children of employed mothers spend more time in nurseries

and childcare centers; care outside the home usually increases children's direct exposure to potentially infectious agents and, therefore, the risk of having an infectious diseases. This result was consistent with Gordon et al., 2007 who found that maternal employment has statistically significant direct effects on the incidence of infectious diseases and agreed with Morrill, 2011 who reported that maternal employment increases the probability a child has episodes of intestinal and respiratory infections. The rate of hospitalization was significantly higher among children of employed mothers than children of unemployed mothers (Table 3). This result was in line with Morrill, 2011.

We found that there was no statistically significant difference between children of employed and unemployed mothers as regards age of crawling, sitting, walking and dentations (Table 4), These results have disagreed with that of Koutra et al., 2012 in their study on socio-demographic determinants of infant neurodevelopment at 18 months of age: Mother-child cohort study in Crete, Greece.

The present work showed that maternal employment has no effect

on children nutritional status (Table 5). This result was agreed with Hiwot et al., 2017 and Ferguson et al., 2017, who showed that maternal employment does not have a marked impact on the growth and nutrition status of children. However, different results were noted by McDonnell, 2014, and Fitzsimons and Pongiglione, 2019, who found that children of employed mothers have an increased risk of childhood overweight and increases children's BMI (Body Mass Index). On the other hand, Yana van der, 2016 reported that maternal employment was associated with a greater risk of stunting and wasting. The same association was noted by Baharudin et al., 2019 and Rashad and Sharaf, 2019 who found a strong negative association between maternal employment and child nutritional status as maternal employment deteriorate children HAZ (Height for Age Z score). We found that anemia was significantly higher among children of unemployed than employed mothers, 20.3% versus 11% (Table 5). This can be explained by high income, education level and socioeconomic status of employed than unemployed mothers.

### **Conclusion and recommendations:**

Maternal employment has a negative

impact on breastfeeding practice and increase infectious diseases occurrence and hospitalization rate among children. The study also showed that there was no effect between maternal employment and the motor development and nutrition status of the children. The government has to encourage the implementation of national legislations, which mandated the employers to provide their employees with childcare centers and nurseries near to the workplace.

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### **Conflict of interest**

None declared

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