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IMPACT OF MATERNAL DEPRESSION ON GROWTH OF THE CHILD

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Abstract

Depression is common in women of reproductive age in developing and developed countries. As mothers are primary care takers of their children, they play a significant role in growth of the child. Therefore, mothers who are depressed can adversely affect the growth of the child.

OBJECTIVE: *To assess the prevalence of maternal depression and its effect on growth of the child in developing countries such as Pakistan.*

METHOD: *84 participants in JMCH Korangi who met our inclusion criteria were given a consent form. We read out and explained everything to illiterate participants and their thumb prints were taken. The weight of the babies aged between 3 months to 36 months were plotted on a growth chart and their mother's depression was assessed using ICD-10 and PHQ-9 questionnaire. We used SPSS version 25 to analyze the data.*

RESULT: *56% of mothers were depressed out of which 70.2% of the babies were below 3rd; 10.7% were mildly depressed with 13.6% children below 3rd percentile, 29.8% were moderately depressed with 38.6% children below 3rd percentile, 11.9% were moderately severely depressed with 15.9% children below 3rd percentile, 3.6% were severely depressed with 6.8% children below 3rd percentile. 29.8% were above 3rd percentile.*

CONCLUSION: *Our data concludes that there is an association between maternal depression and the growth of a child. It was found that the children who were below the 3rd centile had mothers who were dealing with depression.*

INTRODUCTION

This study shows the relation between maternal depression and the growth of the child. Depression is a common and serious medical illness that negatively effects how you feel, the way you think and how you act. Depression causes feeling of sadness, loss of interest in daily activities and it can lead to many psychological and physical problems that can hinder a person's ability to be a functional member of a society. 3.8% of the total world population is affected by depression. According to global estimates nearly 10% of pregnant women and 13% of new mothers suffer from mental health issues like depression, anxiety and stress. Most developing countries are affected to a greater extent than developed countries, 15.6% and 19.8% respectively. 10.7In developing countries including Pakistan the prevalence of maternal depression is continuously increasing ranging from

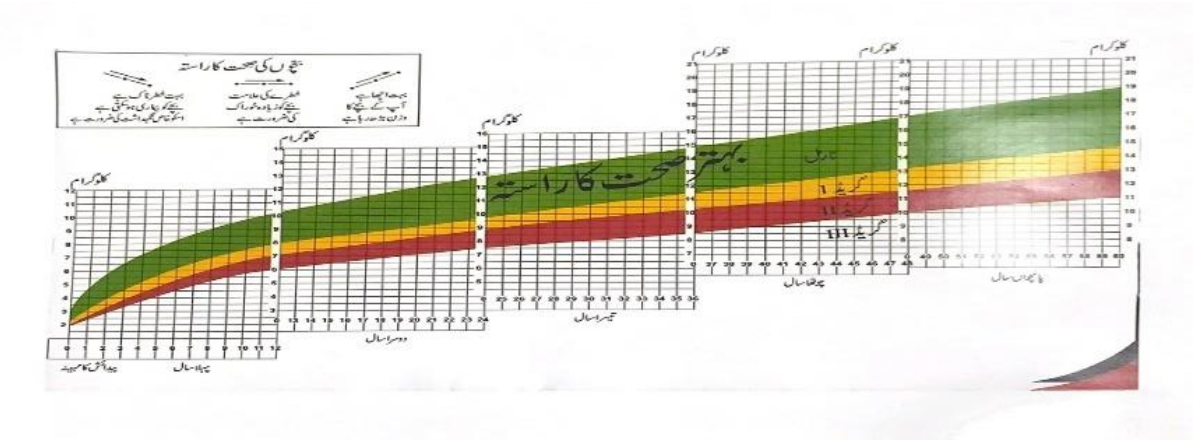
16% to 35%. Research conducted in China showed increased rate of low birth babies of about 1.41, 95% CI 1.17-1.70; adjusted OR 1.29, 95% CI 1.07-1.57 associated with maternal depression, also a study conducted in northern Ghana showed 27.8% mothers suffered from depression of which 16.1% children showed stunting.

Depression can affect anyone but one of the most vulnerable groups affected by it are the mothers. Depression causes mothers to feel burdened and alone as they are the main care givers of their babies and the responsibility of a new born child is very demanding and tiring. There are many factors that can cause depression, such as loss of a loved one, financial issues, marital conflict and even hormonal fluctuations. Maternal depression during the course of the pregnancy is a huge risk factor and may lead to low fetal birthweight and premature delivery, as well as fetal and infant death and complications during delivery.

If a fetus does survive birth, there are high chances that a depressed mother may not be able to care for the child in a proper manner. When a woman is unstable mentally, she may not be able take care of herself and her child may lead to child neglect with long term consequences. First five years of a child's life is very sensitive that needs lots of attention and proper care. When a child grows up in an environment where the mother is suffering, it badly affects their cognitive abilities and impacts their young minds, leading to slow mental development, agitated behavior, social anxiety, lack of confidence and several other disorders adversely affecting their personality and growth. As these mothers fail at their role, children born to these mothers are usually underweighted for their age. Having trouble getting along with other kids, increased mischievous behavior to gain attention, anger management issues, childhood trauma are just some of many problems these kids develop.

Malnourishment is defined as falling beneath the 3rd centile on standardized growth chart for at least 3 months excluding weight loss/low weight secondary to acute illness. According to WHO Under nutrition manifest in broad forms, wasting stunting underweight and micronutrient deficiency. Wasting is defined as low weight for height, stunting is defined as low height for age, underweight is defined as low weight for age and micronutrients deficiencies are a lack of vitamins and minerals that are essential for body function, under nutrition is associated with 45% of child's death

Materials and Methods



This case control study was conducted in pediatrics department of JMCH Korangi, Karachi. A total of 84 babies aged between 3 months to 36 months were taken and their mothers were referred to psych department for the assessment for depression. Interview was conducted through ICD 10 criteria for depression the mother who fulfilled the diagnostic criteria for depressed was further assessed by phq9 for severity. Out of 84, 40 were control subjects and 44 were case subjects, this was calculated using OpenEPI sample size calculator and non-probability purposive sampling technique was used. Children with any known disability (Cerebral Palsy, chronic illness and any other congenital anomalies), mental disabilities, small for gestational age and mothers with physical and mental disability were excluded. The study was

conducted during a period of 6 months. We asked mothers a series of questions using PHQ 9 questionnaire and a scoring was done to assess the presence of depression and its severity, a score more than 4 suggested presence of depression. WHO growth chart was used to assess weight of the child; Children who were below 3rd percentile were taken as underweight and above 3rd percentile were taken as normal babies. Along with this a brief bio data of the child and the mother such as marital status, maternal education, occupation and socio-economic status was also taken. A written consent form was either signed or an oral consent was taken from all the mothers who participated in the research. (ask sir about method and approval) The SPSS version 25 was used to analyze the data

3. Results

The study population consisted of 89 participants, with an average age of 15.63 months (SD = 8.21). The majority were male (57.3%), and most mothers were married (93.3%). Maternal income averaged 7,202.25 PKR (SD = 10,101.9), while paternal income was significantly higher at 23,000 PKR (SD = 11,204.7). The average weight of the children was 8.7 kg (SD = 1.79). Regarding maternal depression status, 44.9% of mothers reported no depression, while 10.1% experienced mild, 29.2% moderate, 12.4% moderately severe, and 3.4% severe depression, resulting in a total depression score of 7.46 (SD = 6.67). These findings highlight the significant prevalence of maternal depression in this population, which may have critical implications for child development and overall family health, emphasizing the need for targeted interventions. (Table:1)

The comparative analysis of demographic and socioeconomic variables between depressed (n=45) and not depressed (n=44) groups revealed no statistically significant differences across several factors. The average age of children in the depressed group was 16.41 months (SD = 8.3), compared to 14.84 months (SD = 8.0) in the not depressed group (p=0.36). Gender distribution showed no significant disparity, with 32.6% of depressed children being male versus 24.7% in the non-depressed group (p=0.16). Marital status did not differ significantly, nor did paternal income, which averaged 23,377.77 PKR (SD = 11,813.49) in the depressed group versus 22,613.63 PKR (SD = 10,668.83) in the non-depressed group (p=0.71). Additionally, the average weight of children was slightly lower in the depressed group (8.57 kg, SD = 1.64) compared to the not depressed group (8.86 kg, SD = 1.93), but this difference was not statistically significant (p=0.1). These findings underscore the importance of understanding the socioeconomic context of maternal depression, as it may influence child development and necessitate interventions that address both mental health and socioeconomic factors. (Table:2)

The analysis of the relationship between maternal depression status and birth weight categories indicated that among the not depressed mothers, 68.2% had children with normal birth weight, compared to 62.2% of depressed mothers whose children were of normal weight. The odds ratio for low birth weight in children of depressed mothers was 1.30 (95% CI: 0.54–3.12), with a p-value of 0.55, suggesting no statistically significant association. Overall, the total prevalence of low birth weight in the sample was 34.8%. Clinically, while the results indicate a trend towards a higher proportion of low birth weight in infants of depressed mothers, the lack of statistical significance highlights the need for further investigation into the multifactorial influences on birth weight. Understanding these relationships is crucial for developing targeted interventions that address both maternal mental health and infant nutritional outcomes. (Tabel:3)

The analysis of the association between the baby's gender and birth weight categories revealed that 64.7% of male infants had normal birth weight, compared to 65.8% of female infants. The odds ratio for low birth weight between genders was 0.95 (95% CI: 0.39–2.30), with a p-value of 0.91, indicating no significant association between the baby's gender and the likelihood of low birth weight. Overall, the total prevalence of low birth weight in the sample was 34.8%. These findings suggest that gender does not appear to influence birth weight significantly, underscoring the need for further research to explore other factors that may contribute to birth weight variations. (Table:4)

Variable	Frequency (%) / mean (SD) N = 89
Age (in months)	15.63 ± 8.21
Gender	
Male	51 (57.3%)
Female	38 (42.7%)
Marital status	
Married	83 (93.3%)
Widow	3 (3.4%)
Divorced	3 (3.4%)
Maternal income (in PKR)	7202.25 ± 10101.9
Paternal income (in PKR)	23000 ± 11204.7
Weight of child (kg)	8.7 ± 1.79
Depression status in mothers	
None	40 (44.9%)
Mild	9 (10.1%)
Moderate	26 (29.2%)
Moderately severe	11 (12.4%)
Severe	3 (3.4%)
Total depression score	7.46 ± 6.67

Table. 1. Baseline characteristics of study population (Descriptive Statistics of Demographic and Socioeconomic Characteristics of Participants (N = 89)

Gender of the baby	Normal birth weight	Low birth weight	Odd ratio	95% CI	P- value
Male	33 (64.7%)	18 (35.3%)			
Female	25 (65.8%)	13 (34.2%)			
Total	58 (65.2%)	31 (34.8%)	0.95	0.39-2.30	0.91

Table: 2. Comparative Analysis of Demographic and Socioeconomic Variables Between Depressed and Not Depressed Groups

Status of depression	Normal birth weight	Low birth weight	Odd ratio	95% CI	P- value
Not depressed	30 (68.2%)	14 (31.8%)			
Depressed	28 (62.2%)	17 (37.8%)			
Total	58 (65.2%)	31 (34.8%)	1.30	0.54- 3.12	0.55

Table. 3. Relationship Between Depression Status and Birth Weight Categories: Odds Ratios and Statistical Analysis

Variable	Depressed (n=45)	Not depressed (n=44)	P- value
Age (in months)	16.41 ± 8.3	14.84 ± 8.0	0.36
Gender			
Male	29 (32.6%)	22 (24.7%)	0.16
Female	16 (18%)	22 (24.7%)	
Marital Status			
Married	43 (48.3%)	40 (44.9%)	0.18
Widow	3 (3.4%)	0	
Divorced	1 (1.1%)	2 (2.2%)	
Paternal income (in PKR)	23377.77 ± 11813.49	22613.63 ± 10668.83	0.71
Weight of child (unit)	8.57 ± 1.64	8.86 ± 1.93	0.1

Table.4. Association Between Baby's Gender and Birth Weight Categories: Odds Ratios and Statistical Analysis

4. Discussion

Mothers are the sole care giver of a child in our society hence mother's psychological health greatly affects this relationship between mother and their children. Recent studies have shown that there is increased prevalence of depression in Asian mothers that is increasingly affecting the health of a child leading to malnourishment and making them prone to many infections.

According to our research, more than half of the women participating in our survey proved to be suffering from significant depression while 29% of the 84 participants had moderate symptoms of depression.

These women mostly belonged to the lower class and were uneducated. Our research mainly centered on this sector of our society, which lacks awareness regarding depression. The women lack resources and have almost no support from spouses, other family members and in several cases, even their physicians.

Patel et al. (2002) suggested that the depressed mothers had more difficulty in feeding their children be it breastfeed or weaning that led to poor child's growth. Similarly, Rehman et al. (2007) found significantly increase rates of diarrhea among the children of depressed mothers that again lead to malnutrition. It is also suggested that these infections might be due to poor immunization, since depressed mothers are too occupied in their own thoughts to give their children proper attention.

Possible mechanisms of a child's poor growth in depressed mothers could be an unhealthy lifestyle and less attention given to her during her antenatal period making her psychologically unhealthy which ultimately led her to ignore her child's basic needs. The relation between a mother's mental health and her children's physical growth might put some light on the importance of a women's mental health in the health care society. Atif at el. in their study suggested that reduction in maternal depression can reduce the growth retardation of an infant up to 30%. According to our research, more than half of the women participating in our survey proved to be suffering from significant depression while 29% of the 84 participants had moderate symptoms of depression.

Our research proves how prevalent depression is, in our society and how it adversely affects the growth of children, whose mothers are unable to give them proper care and attention due to their own condition. Hence, our using this research we must now aim to create awareness amongst the lower class. We must educate women themselves to take mental and emotional health seriously in order to become stable care givers for their children. Instead of suppressing feelings of depression, women must be provided with outlets to release their negative energies in a healthy manner.

It is definitely a difficult task to create awareness and change mindsets over a short period of time, however medical practitioner can use their position to help such women in any way possible and thus create a better tomorrow for future generations.

5. Conclusions

Our research concludes that there is a correlation between maternal depression and the low weight of the child. It was found that mothers who were dealing with depression had children with weight under the

3rd centile however there were certain factors that restricted the scope of the research that prevented to establish an isolated link between maternal depression and low birth weight of the child. These factors include low sample size, data collection restricted to only one hospital in one particular area of the city and sample from only women of low socio-economic class. Further research is required to reach a proper conclusion and verify the link between these two factors.

6.Limitations

Despite the insightful findings, our study bears some limitations. The research was conducted in only one hospital in Korangi which consisted of only mothers from lower class family. Furthermore, the study sample was low and to get a more detailed data more sample is needed from different location and from mothers of upper and middle class thus more research is required. Lastly, our cross-sectional design limits our ability to establish causality between maternal depression and child underweight status.

7.IMPLICATIONS AND RECOMMENDATION:

Our findings underscore the need for public health policies to integrate mental health services into existing maternal and child healthcare programs. There is a need for regular screening and timely management of depression among mothers, especially those who are young and illiterate.

Moreover, interventions aiming to improve maternal mental health must also consider socio-economic factors, as illiteracy and young age have been identified as risk factors for depression. Efforts should be directed towards improving the education of women and providing mental health support to younger mothers.

Furthermore, longitudinal studies involving larger cohorts are needed to validate these findings and explore the potential benefits of targeted interventions on maternal mental health and child growth

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