ORIGINAL ARTICLE

A STUDY OF INTELLECTUAL CAPACITY OF MOTHERS OF MALNOURISHED AND MOTHERS OF WELL-NOURISHED CHILDREN

BASHIR AHMAD[1], NAEEMA SATTAR[2], AZIZ MOHAMMAD[3]

[1]Asstt. Prof. Psychiatry Khyber Teaching Hospital, Peshawar.
[2]Clinical Psychological Khyber Teaching Hospital, Peshawar.
[3]STR, Psychiatry, Khyber Teaching Hospital, Peshawar.

CORRESPONDENCE: DR BASHIR AHMAD, E-mail: bashirpesh@yahoo.com

ABSTRACT

OBJECTIVE
To compare the intellectual capacity of mothers of malnourished verses mothers of well-nourished children.

STUDY DESIGN
Cross sectional

PLACE OF DURATION OF STUDY
The study conducted from April 2003 to October 2003 at pediatrics department PGMI, Lady Reading Hospital, Peshawar, KPK, Pakistan.

SUBJECTS AND METHOD
The total sample was 200 mothers including 100 of malnourished and 100 well-nourished children's mothers admitted in Pediatrics unit lady Reading Hospital Peshawar. All mothers were administered Raven's Standard Progressive Matrices (RSPM) test for testing their intellectual capacity.

RESULTS
Although majority of mothers in both groups had below average intellectual capacity, a drop was noticed in the intellectual capacity of mothers of malnourished children, and 56% of the mothers in this group had IQ score suggestive of Borderline Mental Retardation (34%) or Mild Mental Retardation (22%). Intellectual impairment was associated with malnutrition in children.

CONCLUSION
Our results demonstrate that mothers of malnourished children had lower intellectual capacity.

KEY WORDS
Maternal intellectual capacity, Malnutrition, nourishment of children.

INTRODUCTION

World health organization estimates that malnutrition is implicated in more than half of all children's deaths worldwide[1]. Nutritional deficiencies at all stages of growth have long-term damaging effects on the intellectual and psychological development of children[2-3]. Early malnutrition can also have a significant impact on cognitive functioning, presumably due to the adverse impact of the malnutrition on the very young brain. Depressive symptoms are elevated in adolescents who experienced significant malnutrition early in life as proposed by developmental cascade model[4].

Intellectual disability affects an individual's capacity to parent a child effectively, and low maternal intelligence (OR 3.8, 95% CI 1.3 to 11.1) has been found to be associated with malnutrition in children[5].

Studies have shown a correlation between postnatal depression and impaired child growth[5]. Others have concluded that common mental disorders in the mothers increased the risk of malnutirion in children to double fold[6]. Although the fact that maternal mental illnesses contribute to malnutrition in children along with other factors such as poverty, and the fact that malnutrition has vast physical and mental consequences for the children have been established, the correlation of maternal intelligence and malnutrition in children has not been well explored in observational and controlled studies.

The present study aims at comparing the intellectual level of mothers of under nourished and well-nourished children and to test if the difference found is statistically significant.

SUBJECTS AND METHODS

Participants

It was a hospital based cross-sectional comparative study conducted on 200 mothers consecutively admitted in the department of Pediatrics, Lady Reading Hospital Peshawar, Khyber Pukhtunkhwa, Pakistan from April 2003 to October 2003. Sample was divided into two groups A & B. Group A consisted of 100 Mothers of Malnourished Children (MoM-C) [weight for age below the National Centre for Health Statistics (NCHS) World Health Organization (WHO) third centile] while Group B consisted of 100 Mothers of Well-nourished Children (MoW-C) [weight for age above 10th centile]. Mothers who did not consent for the study were excluded.

Instruments

Each of the 200 mothers with malnourished and well-nourished children received

Raven Standard Progressive Matrices (RSPM) test[7] to find out their intellectual capacity which was calculated from their raw score on the test. RSPM is a 60 item test used in measuring abstract reasoning and because of its independence of language and reading and writing skills, and the simplicity of their use and interpretation is regarded as a non-verbal estimate of intelligence.

RESULTS

The mean age of the mothers in both groups was 22.7 ± 4.5. Majority of the mothers were young as shown in Table 1 and had no formal education (table 2). Socioeconomic condition of the subjects was not satisfactory with almost uniform distribution between the two groups (Table 3). Although majority of mothers in both groups had below average intellectual capacity, a drop was noticed in the intellectual capacity of Mothers of malnourished Children, and 56% of the mothers in this group had IQ score suggestive of Borderline Mental Retardation (34%) or Mild Mental Retardation (22%) as shown in figure 1.

A chi-square test of independence was performed to examine the relation between the mothers of well nourishes children (MoW-C) and Mothers of Malnourished Children (MoM-C) for education level, socioeconomic status and intellectual capacity. Both age and educational level of the mothers did not show significant association with malnutrition in their children, X2 (1) = 0.26, p = .87 and X2 (1) = 5.27, p = .26 respectively (see table 1 and 2). The associations between malnutrition and variables of socioeconomic status and Intellectual capacity of mothers were significant, X2 (1) = 9.17, p = .027 and X2 (1) = 45.97, p < .001 respectively (see table 3 and 4). Children of mothers with poor socioeconomic status (table 3) and low intellectual capacity were more likely to be malnourished than children of mothers with satisfactory socioeconomic status and high intellectual capacity (see figute 1).

Table 1
Age Distribution of Patients

Age Distribution	MoM-C	MoW-C	Percentage
16-25 years	48	47	47.50%
26-35 years	36	39	37.50%
36-44 years	16	14	15.00%
Total	**100**	**100**	**100%**

$X^2(1)=0.26, P=0.87$

Table 2
Educational Qualification of The Subjects (n=200)

Qualification	MoM-C	MoW-C	Total	Percentage
Illiterate	89	80	169	84.50%
Primary School	3	6	9	4.50%
High School	7	13	20	10.00%
Graduation	1	0	1	0.50%
Master Degree	0	1	1	0.50%
Total	**100**	**100**	**200**	**100%**

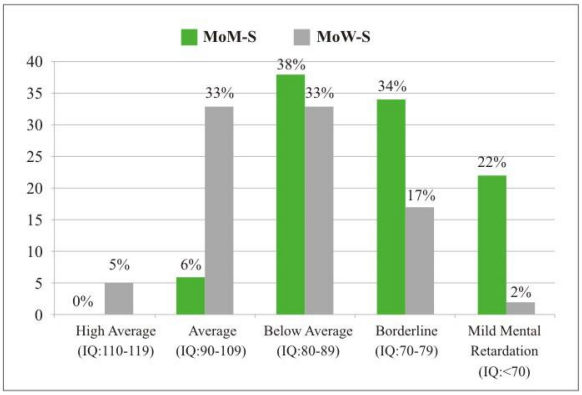
$X^2(1)=5.27, P=0.26$

Table 3
Socioeconomic status of the mothers

Monthly Income	MoM-C	MoW-C	Total	Percentage
<5,000	26	22	48	24%
5,000-10,000	49	33	82	41%
10,000-2,0000	12	22	34	17%
>20,000	13	23	36	18%
Total	**100**	**100**	**200**	**100%**

$X^2(1)=9.17, P=.027$

Figure 1
Comparison of the intellectual capacity Between the two groups. (n=200)



$X^2(1)=45.97, P<0.001$

DISCUSSION

Our study results are consistent with other studies on the subject in some respects while differ in other respects. For example, our results indicated that a significant number of mothers in both the group had below average intelligence however, more mothers were intellectually defective in the malnourished group as compared with the non – malnourished group. This is line with finding from Anoop S et al[8].

An interesting finding in the current study was that although mental health problems were more prevalent in mothers of malnourished children (31%) compared to the well-nourished children (21%), however this difference was not found statistically significant. Another interesting finding was that a significant proportion (40-50%) in both the groups had below average intelligence. Despite the fact that mothers with well-nourished children were having mental health and intellectual capacity problems, they were still able to deliver adequate childcare. This is in line with findings from recent Cochrane data base review[9] that revealed that some parents with intellectual disabilities are able to provide adequate child care if they are given appropriate training and support to do so. One explanation could be that majority of the population in Pakistan and particularly in this part of the country, (Khyber Pukhtunkhwa) are living in joint families where they receive support and help from one another.

It is therefore imperative to integrate strategies of combating children malnutrition and intervention programs of improving

maternal mental health especially in regions with high malnutrition prevalence. Unfortunately, Child nutrition programmes do not adequately address maternal mental health in these regions[10]. Even the World Health Organization's robust Integrated Management of Childhood Illness strategy does not tackle maternal mental health. Appropriate training and rehabilitation services for intellectually disabled mothers as well as addressing their psychological problems could potentially improve all aspects of childcare including their nutritional condition.

CONCLUSION

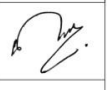
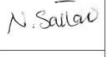
Since malnutrition is found associated with malnutrition of the children. It is therefore needed to design parent training interventions for parents with intellectual disabilities which may improve nutrition in their children. Previously it is been studied that parent training interventions for parents with intellectual disabilities can improve parenting skills and such parents must be provided with all possible training and support[11].

LIMITATIONS

Intelligence measured through the Raven's Structure Progressive Matrices Test may not be the true gauge intelligence of the sample under study, as the test has not been standardized and validated for population other than children in Pakistan and Khyber Pukhtoonkhwa, but this limitation could be ignored because of presence of comparison group in the study. Although the study recruited a sample of mothers of well-nourished children, it could not be a true representative of the general population as both the groups had children admitted in paediatric unit hence undergoing through stress.

REFERENCES

1. Pelletier DL, Frongillo EA, Schroeder DG, Habicht JP. The effects of malnutrition on child Mortality in developing countries. Bull World Health Organ. 1995;73:443-448.
2. Grantham-McGregor S. Linear growth retardation and cognition. Lancet. 2002;359:542.
3. Cheung YB, Khoo KS, Karlberg J, Machin D. Association between psychological symptoms in adults and growth in early life: longitudinal follow up study. BMJ. 2002;325:749.
4. Deborah P, Waber, David E, Garrett M. Fitzmaurice, Cyralene B, Robert H. Cognitive Impairment as a Mediator in the Developmental Pathway from Infant Malnutrition to Adolescent Depressive Symptoms in Barbadian Youth. J Dev Behav Pediatr. 2011 Apr; 32(3): 225–232.
5. Anoop S, Saravanan B, Joseph A, Cherian A, Jacob K. Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India. Arch Dis Child. 2004 Apr; 89(4): 325-329.
5. Patel V, Rahman A, Jacob KS, et al. Effects of maternal mental health of infant growth in Low-income countries: new evidence from South Asia. BMJ 2004;328:820–3.
6. Santos DS, Santos DN, Silva Rde C, Hasselmann MH, Barreto ML. Maternal common mental disorders and malnutrition in children: a case-control study. Soc Psychiatry Psychiatr Epidemiol. 2011 Jul;46(7):543-8.
7. Arthur R. Jensen, Dennis P, Saccuzzo, Gerald E. Larson. Equating the Standard and Advanced Forms of the Raven Progressive Matrices. Educational and Psychological Measurement 1988 48: 1091.
8. Anoop S, Saravanan B, Joseph A, Cherian A, Jacob KS. Community child health, public health, and epidemiology; Maternal depression and low maternal intelligence as risk factors for malnutrition in children: a community based case-control study from South India. Arch Dis child 2004;89:325-329 doi:10.1136/adc.2002.009738.
9. Coren E, Hutchfield J, Thomae M, Gustafsson C. Parent training support for intellectually disabled parents. Cochrane Database Syst Rev. 2010 Jun 16;(6).
10. Rahman A, Patel V, Maselko J, Kirkwood B. The neglected 'm' in MCH programmes—why Mental health of mothers is important for child nutrition. Trop Med Int Health. 2008 Apr;13(4):579-83.
11. Rahman A, Iqbal Z, Harrington R. Life events, social support and depression in childbirth: perspectives from a rural community in the developing world. Psychol Med 2003;33:1161–7.

Sno.	Author Name	Affiliation of Author	Contribution	Signature
1.	Dr Bashir Ahmad	Asstt. Prof. Psychiatry KTH	Study Design, Data Collection Data Analysis	
2.	Dr. Naeema Sattar	Clinical Psychological KTH	Data Collection	
3.	Dr. Aziz Mohammad	STR, Psychiatry, KTH	Literature Review, References