

Feeding Problems in Children with Congenital Heart Diseases in Nasiriya Heart Center

مشاكل الإرضاع للأطفال المصابين بأمراض القلب الولادية في مركز الناصرية للقلب

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المستخلص:

الهدف: معرفة مشاكل التغذية للأطفال المصابين بأمراض القلب الولادية
المنهجية: عينة غير احتمالية غرضيه من (65) طفل تم اختيارهم من 225 طفل زاروا مركز القلب في الناصرية خلال فترة الدراسة وجمع العينة، تم تشخيصهم مسبقا بمرض القلب الولادية.
النتائج: نتائج الدراسة الحالية أظهرت إلى أن الأطفال المصابين بأمراض القلب الولادية لديهم صعوبات في التغذية، وزنهم اقل من الطبيعي، اسهال متكرر، وهناك أكثر من نصف العينة يتناولون علاجات أمراض القلب سببت للأطفال تقيؤ متكرر وصعوبة في تناول السوائل وكذلك رفض الرضاعة (التغذية). نتائج الدراسة عكست ان (32.3%) يعانون من قلة الوزن، (64.6%) من عينة البحث يعانون من هزال، (78.5%) يعانون من التقزم و(49.2%) يعانون من سوء التغذية او الرضاعة.
التوصيات: أنشاء وحدات تغذية تقع في مستشفيات أمراض القلب والمراكز الصحية، لتعليم العوائل طرق التغذية من خلال برامج غرضها رفع الوعي للعوائل حول المشاكل التغذوية للطفل.

Abstract:

Objective: To identify feeding problems of children with congenital heart disease.

Methodology: Non probability (purposive) sample of (65) were selected of 225 children who visit Al Nasiriya heart center during the period of conducting the pilot study, previously diagnosed with congenital heart disease.

Results: The study results indicated that children with congenital heart disease have feeding difficulties, low birth weight, repeated diarrhea, more than half of the sample taking medication for heart disease which cause repeated vomiting, difficulty taking liquids and refusal of feeding or eating. (64.6%) of study sample suffered from wasting. (78.5%) suffered from stunting. Almost half of the study sample suffered from malnutrition (49.2%).

Recommendation: The study recommended an establishment of feeding unit, located at heart disease hospitals and health centers, to teach the families the methods of feeding through teaching program for the purpose of raising their awareness about child's feeding problems.

Keywords: Feeding problems; congenital heart diseases; Children

Introduction:

Infants and children are more likely to suffer from poor nutrition. There are a number of reasons for this: First one low nutritional store: Newborn infants have low stores of fat and protein. The smaller the child, the less reserves of energy they have. This means that they can only cope with starvation for shortened periods of time. The second reason is high nutritional demands for Growth: The amount of nutrition children require is greatest during infancy, because of their rapid growth during this period. When the child is 4 months old, 30% of their nutritional intake is used for growth. By the age of 1 year, this falls to 5%. The third reason is rapid development in the nervous system: the child's brain grows rapidly during the last four months of pregnancy and also during the first two years of the life. The connections between the nerve cells in the brain are being formed during this time. Therefore, good nutrition is important to ensure that this occurs properly. The fourth reason is illness: the child's nutrition may be compromised following an episode of illness or surgery. The body's energy requirements are increased, thus intake of food and nutrients should be increased⁽¹⁾.

Nutrition goals for infants & children with congenital heart disease provide adequate calories and protein, taking into account potentially increased needs, promote normal weight gain and growth velocity, and promote oral feeding as able. Chronic illness or extended hospitalization may result in oral feeding challenges; maintain normal/near normal electrolyte levels. The child should watch closely for abnormalities if the child is on highly concentrated feedings or certain medications⁽²⁾.

If a child has documented growth failure or is having difficulty meeting nutrition needs with an oral diet, supplemental tube

feedings may be considered for additional energy and protein⁽³⁾.

Aggressive feeding strategies must be employed early with these children in order to prevent permanent growth disturbances because congenital cardiac abnormalities cause growth retardation as well as the strategies applied to help these children achieve normal weight⁽⁴⁾.

Congenital heart disease (CHD) is a defect in the heart or major blood vessels that is present in children at birth & CHD occurs in approximately 1% of live births in developed countries. Infants and children with CHD exhibit a range of delays in weight gain and growth. In some instances the delay can be relatively mild, whereas in other cases, cause the failure to thrive⁽⁵⁾.

The term anthropometry refers to comparative measurements of the human body. The primary measures used as indices of growth and development include stature (length or height), weight, and head circumference (for young children). The secondary measures used to estimate body composition include triceps skin fold thickness, subscapular skinfold thickness, and mid-upper arm circumference⁽⁶⁾.

An important index of a child's nutritional status and should be monitored on a regular basis. Stature (length or height), weight, and head circumference are typically evaluated by comparing individual measurements to population data, represented by percentile curves on a growth chart. Current charts for assessment of growth have been constructed from cross-sectional studies in which large numbers of healthy children representing the racial and ethnic diversity of the United States of America were carefully measured at various ages and the data ranked in percentiles⁽⁷⁾.

Methodology:

A descriptive study was carried out on 65 child aged (birth ≤ 5) years were selected according specific criteria.

Anthropometric measurements:

The weight is measured for each child with CHD in the study. It is measured without shoes and light clothes as possible. The investigator used weight scale which is highly reliable and borrowed from the Iraqi Nutrition Research Institute, which is a gift from the United Nation Children's Fund (UNICEF) and has a capacity of (188.8) kg.

Before use the scale, the investigator is checking the scale daily by weight a standard weight. During weighting, the scale was placed on a hard-floor surface, and each participant was stand still in the center of the platform of the scale with the body weight evenly distributed between both feet. The height of children above two years is measured without shoes by using measuring tape of height two meters (UNICEF tape measure) it is already reliable. The individual should stand on a flat surface with weight distributed evenly on both feet, heels together and the head upward. The arms are hanging freely to the sides, and the head, back, buttocks and heel are against the wall with the knee fully extended and line of vision parallel to floor, while the child under two years was measured recumbent ⁽⁸⁾. And other anthropometric measurement like Weight /age, weight/height, height/age and BMI/age was calculated by scientific application program (WHO Anthro plus) which obtained from Iraqi Nutrition Research Institute. According to the Dietary Guidelines for Americans 2010 & Nutrition research Institute in Baghdad body mass index is a measure of weight in kilograms (kg) relative to height in meters (m) squared.

Other anthropometric measurement category for children according to Dietary Guidelines for Americans 2010 & Nutrition

research Institute in Baghdad represent as table(1).

Table (I): Anthropometric Measurement Category for Children

z- score	Growth indicators			
	Ht./age	Wt./age	Wt./ht.	BMI/age
+3z score	Very long	Obese	Obese	Obese
+2z score	*	Over weight	Over weight	Over weight
+1 z- score	*	Potential serious Weight gain	Potential serious weight gain	Potential weight gain
0z- score	*	*	*	Normal weight
-1z score	*	*	*	Under weight
-2z score	Stuntin g	Under weight	Wasting	Malnouri shed
-3z- score	Sever stuntin g	Sever under weight	Sever wasting	Sever Malnouri shed

Ht.: height Wt. : weight BMI.: Body Mass Index

Ref: Dietary Guidelines for Americans and Nutrition Research Institute in Baghdad, 2010

*If signed point plotted on the line z score are regarded as the least serious category.

All anthropometric measurement was calculated by scientific application program (WHO AnthroPlus) which obtained from Iraqi Nutrition Research Institute.

Questionnaire:

The socio-demographic data sheet, consisted of (10) items categorized as general information (children age and gender) and socioeconomic data (parents level of education, parents occupation status, type of family, total number of family, number of rooms, house area, house content and car possession). Question about the recent nutritional status of Children with Congenital Heart Disease & Dealing with Food and formula. Reliability of the questionnaire was determined through pilot study "test – retest" it was (0.82) and the validity determined through a panel of experts in the field.

A statistical analysis was performed using the Microsoft office excel 2007 and SPSS package (version 16). Chi- square statistics were used to determine the presence of an association between the variables.

Results:**Table 1.** Distribution of the Study Sample by their General Information

Variables		No.	%
Gender	Male	38	58.5
	Female	27	41.5
Age (years)	0-2 year	44	67.7
	Above2- >5 years	21	32.3
SES	High	3	4.6
	Middle	21	32.3
	Low	41	63.1

No. = number, % = percentile, SESS = Socio-economic Status Score

The table (1) shows that (58.5%) of the children were male, (67.7%) their age is 0-2 years old, and (63.1%) of them coming from low level of socio economic status score.

Table 2. Distribution of the Frequencies, Percentages of Underweight Wasting, Stunting and Malnourished Relative to Anthropometric Measurement

Z-score	Weight / Age		Weight / Height		Height / Age		BMI / Age	
	No	%	No.	%	No.	%	No.	%
+3Z-score	-	-	2	3.1	1	1.5	-	-
+2Z-score	4	6.2	-	-	-	-	1	1.5
+1Z-score	3	4.6	3	4.6	-	-	9	13.8
Median	24	36.9	10	15.4	10	15.4	22	33.8
-1Z-score	13	20.0	8	12.3	3	4.6	1	1.5
-2Z-score	12	18.5	28	43.1	35	53.8	19	29.2
-3Z-score	9	13.8	14	21.5	16	24.6	13	20.0

No. = number, % = percentile, BMI=body mass index

This table shows the distribution of anthropometric studies through z-score, weight for age ,that (18.5%,13.8%) either have underweight , severe underweight respectively, (43.1%,21.5%) have wasting or sever wasting respectively, weight for height (53.8%,24.6%) were stunting or sever stunting in height for age and (29.2%,20.0%) were malnourished or sever malnourished in relation to BMI for age .

Table 3. Statistical Summary of the Studied Anthropometric Measurements of the Sample Relative to Z- score

Anthropometric measurement		frequency	percentage
Weight for Age	Underweight	21	32.3
	Not	44	67.7
Weight for Height	Wasting	42	64.6
	Not	23	35.4
Height for Age	Stunting	51	78.5
	Not	14	21.5
BMI for age	Malnourished	32	49.2
	Not	33	50.8

Table (3) shows the final result for sample general condition from calculated the -2,-3 z- score of anthropometric measurement to reflect the final scale of weight for age represent underweight ,weight for height represent wasting ,height for age represent stunting and malnourished for Body Mass Index for age. However, the other z-scores of -1, 0, +1, +2and +3 represent no problems with anthropometric measurement and wasting, stunting, underweight and malnourished. That (32.3%) were underweight in weight for age, (64.6%) were wasting by weight for height, (78.5%) were stunting by height for age, and almost half of the sample (49.2%) has malnourished in relation to BMI for age.

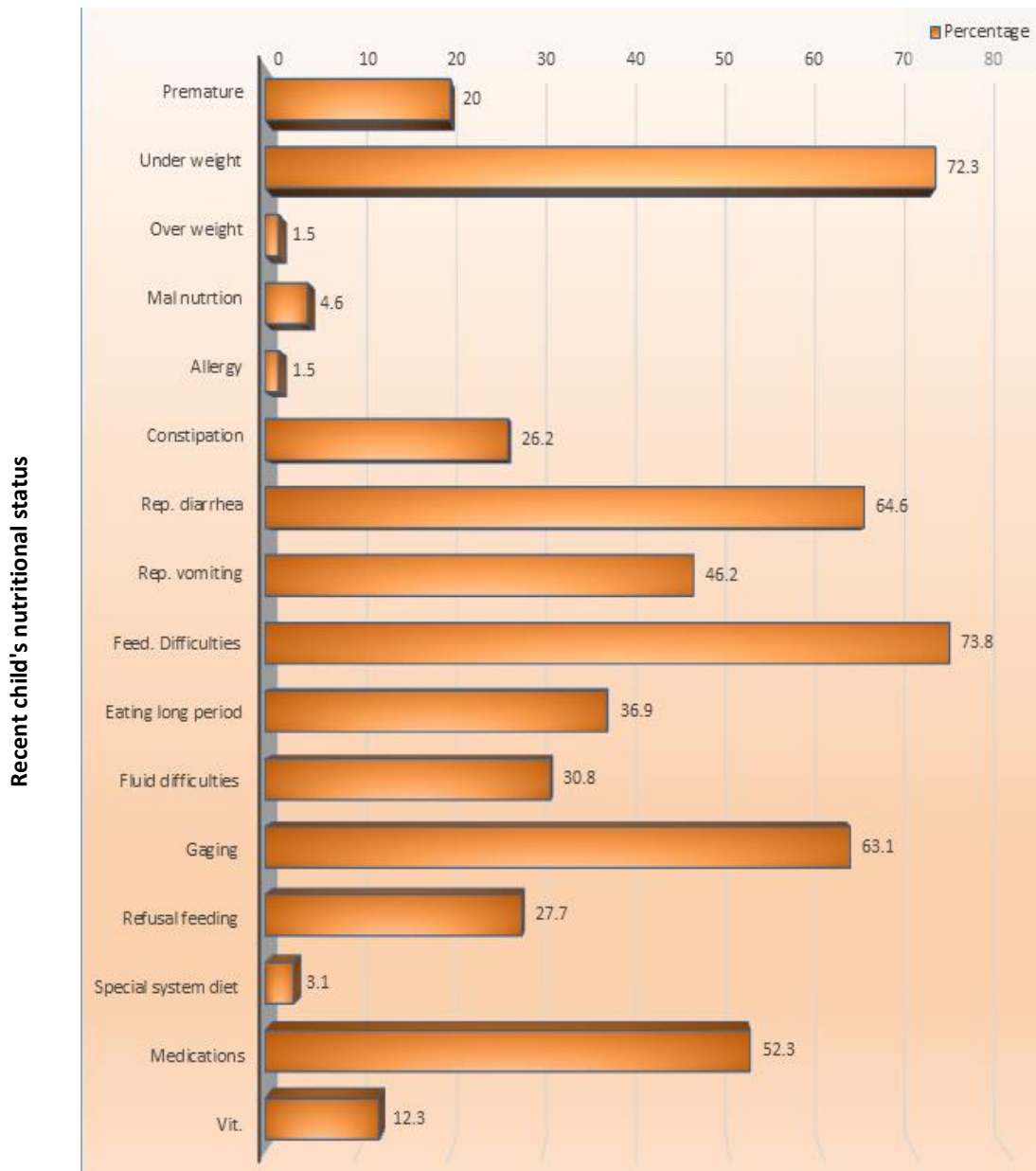


Figure 1. Distribution of the Recent Nutritional Status of Children with Congenital Heart Diseases

Figure (1) shows that (73.8%) of the sample have feeding difficulties, (72,3%) were low birth weight , (64.3%) have repeated diarrhea , (63.1%) have gaging and more than half of the sample(52.3%) were taking medication for heart disease ,(46.2%) have repeated vomiting,(36.9%) take long time during eating , (30.8%) have difficulty taking liquids and (27.7%) were refusal feeding .

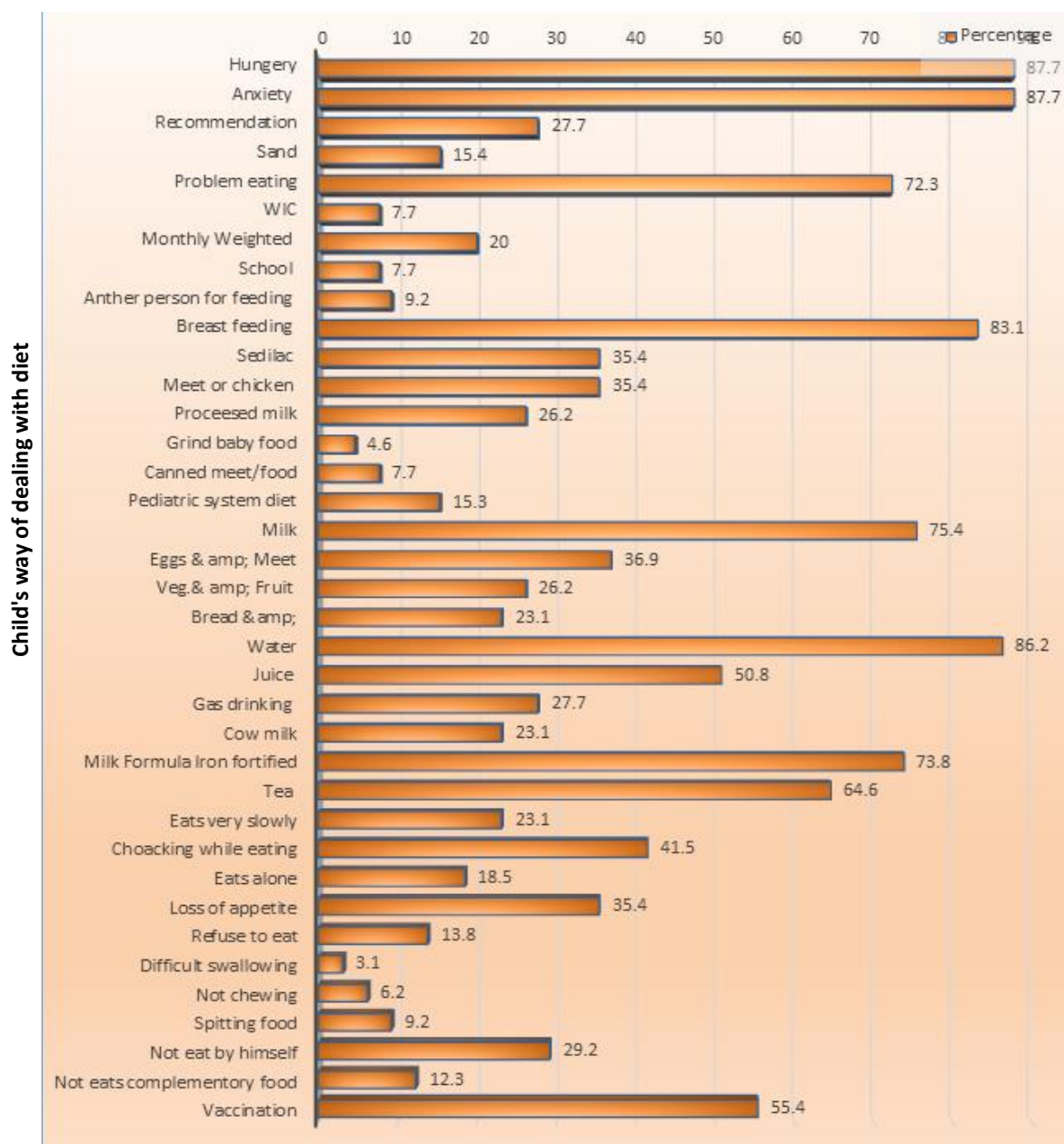


Figure 2. Distribution of the Percentages of Children with Congenital Heart Diseases Dealing with Food and Formula

Figure (2) shows the ways of eating, (87.7%) of children eating only when they are hungry, (87.7%) of their mother's worry about their children eating, (72.3%) were children have problem with eating, (64.6%) of children drink tea, (41.5%) chucking while eating and (35.4%) loss their appetite.

Discussion:

Table(1) indicates that two third of the sample in age group of (0-2) years (67.7%), is age 0-2 the close stage of birth in terms of the onset of the symptoms and the discovery of these cases of heart disease.

The present study in consistent with many studies related to nutritional status of

children with CHD ⁽⁹⁾, to assess the nutritional status of children with congenital heart disease in 48 children admitted to the hospital, and other study of feeding problems in children with CHD: the impact on energy and growth outcome to analyzed presence or absence of early feeding problem in 40

children, but these studies don't focus on the gender.

Table (2) indicated that study sample weight for age ,weight for height ,height for age and BMI for age, either have underweight or severe underweight (18.5%,13.8%) respectively, (43.1%,21.5%) have wasting or severe wasting respectively, weight for height (53.8%,24.6%) were stunting or severe stunting in height for age and (29.2%,20.0%) were malnourished or sever malnourished in relation to BMI for age .This finding is supported by a study indicates that differences in fat and muscle areas are associated with prenatal and postnatal growth differences, For these reasons, it is recommended that assessment of nutritional status during growth period & the children condition explain with reference to fat and muscle area, the calculations of fat and muscle area are easily performed through manual calculation and they can also be obtained by interpolation from published monograms ⁽¹⁰⁾.

The final result for the present study sample in table(3) reveled the general condition from calculated the -2,-3for all z-score of anthropometric measurement and reflect the final scale of weight for age which shows and represents underweight ,weight for height represent wasting ,height for age represents stunting and malnourished for Body Mass Index for age.

However, the other z scores of -1, 0, +1, +2and +3 represents no problems with anthropometric measurement and wasting, stunting, underweight and malnourished. This result might be due to less amount of body required of nutrition which related to CHD & the children condition affected by the disease and prevents the child to get enough nutrition from feeding.

The study by UN standing committee on nutrition (2004) fifth report on the world nutrtrion situation Geneva,WHO was reported

of wasting , stunting and underweight for some countaries in (0-5) old children ; Afghanistan (16.1%) is wasting ,(47.6%) have stunting an (49.3%) have under weight;In india (15.7%) is wasting ,(44.9%) have stunting an (46.7%) have under weight; Ethiopia (10.5%) is wasting ,(51.5%) have stunting an (47.2%) have underweight.

The result of figure (1) shows the recent nutritional status of children with congenital heart disease and some feeding difficulties such as low birth weight , repeated diarrhea, gagging and more than half of the sample were taking medication for heart disease , repeated vomiting, take long time during eating , difficulty taking liquids and some of them refusal feeding .

A study from Institute of Nutrition Research, School of Medicine, University of Oslo, Norway, 2009 shows cross-section data on growth outcome, anthropometric measurements and energy intake in a study of "Feeding problems in children of congenital heart disease: the impact on energy intake and growth outcome" have been analysis feeding problems and poor appetite was reported a significant problem in children with CHD and sub abnormal height and/or weight were recorded ⁽¹¹⁾. In the same study it has been shown that the feeding of infant and children with CHD involves difficulties time and anxiety for mother as a care giver. At this time of the present study refusal to eat or poor feeding was reported by parents as a significant problem in some children and subnormal height and weight were recorded, the children take considerably less calories than recommended for healthy children.

Parent's experience about feeding problem may be a good predictor for low growth out come and low voluntary intake of the child ⁽¹²⁾.

The result of figure (2) shows the ways that family dealing with their child in relation to food formula of children with CHD, the

children eating only when they are hungry, the mother worry / worried about eating, the children have problem with eating , drink tea , chugging while eating and children have loss of appetite . This result comes along with the other studies like ⁽¹³⁾ a study conducted of caring child with congenital heart disease: Practical and Resources was reported that many parents feel great frustration when the baby or child has difficulty eating; they not understand the connection between feeding problems and the heart condition. They may inadvertently exhaust the child during feedings or underestimate the importance of appropriate caloric intake. Well-meaning family and friends often tell parents, "The baby will eat when he's hungry." Parents should be aware of the connection between feeding issues and CHD and be guided to appropriate resources for help.

Another study ⁽¹³⁾ conducted that parents of children with CHD are often confused about the functions and possible side effects of their child's medication

Parents of children with complex congenital heart disease (CHD) have the difficult task of understanding their child's medical condition and learning how best to care for them. Unfortunately, many parents of children with CHD have significant knowledge gaps that may impact care, possibly due to a lack of understanding or remembering important instructions ⁽¹⁴⁾.

Recommendations:

- 1.The establishment of feeding units for children who suffer from heart disease in the hospitals and health centers for the purpose of raising mothers' awareness and providing children with heart problems and their families with a program of feeding sick children.
2. Programs focused on promoting change in the methods of feeding among mothers to feed their babies.

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