

Prevalence and Profile of Malnutrition
in Under-Five children with Congenital
Heart Diseases attending Cairo
University Pediatrics Hospital

Thesis

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Public Health

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ABSTRACT

Background: Studying the link between child malnutrition and disease morbidity and mortality has gained much ground over the past years. With focus being drawn towards malnutrition's connection with congenital heart diseases (CHD), it was found that despite the advancements their management, still malnutrition rates persist to stay high in this population.

Aim: To study the prevalence of malnutrition in under-five children with CHD and study the factors related to it and thus raise the awareness of such a problem and its implications.

Methods: This study included 300 under-five CHD patients attending the cardiology outpatient clinic in AboulRish Pediatrics hospital. An anonymous, structured interview questionnaire was designed to collect data from the guardians regarding sociodemographic data, nutritional knowledge and care, different feeding habits and patterns, medical care and condition. Anthropometric measurements were obtained for all the cases, for which growth curves were plotted and compared to the WHO standards and laboratory investigations were performed.

Results: The study showed the mean age of the patients to be 20.8 ± 17.6 months, with varying uncomplicated and non-severe CHD diagnoses. The mean weight-for-age z-score was -1.9 ± 0.6 , the mean height-for-age z-score was -1.8 ± 0.6 and the mean weight-for-height z-score was -1.2 ± 0.7 , this in addition to the mean Hb% of the studied patients was 11.6 ± 1.7 . Stunting was found in 89 (29.7%) patients, wasting in 20 (6.7%) and 132 (44%) children were underweight, with a total malnutrition of 141 (47%). the prevalence of anemia was 96 (32%). Positive correlations were found for malnutrition and anemia, financial status and commencement of complementary feeding as well as a significant negative correlation between breastfeeding duration and stunting.

Conclusion & Recommendations: Malnutrition is an evident problem among under-five children with CHD. It is significantly related to anemic status, financial status and feeding practices. There was general lack of nutritional knowledge and neglect of nutritional care and practice directed towards these patients. The study recommends that nutrition education should be mandated as a component of the cardiology clinic visit, height and weight measurement with plotting of individual growth curves, regular Hemoglobin analysis. Specialized personnel should consult and advise caregivers about the proper different feeding practices of these children.

Keywords: Congenital heart disease, Malnutrition, Under-five children, Anemia, Anthropometry

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CONTENTS

	<i>Page</i>
List of Abbreviations	V
List of Figures.....	VII
List of Tables	IX
INTRODUCTION	1
AIM OF THE WORK	4
REVIEW OF LITERATURE:	
- CHAPTER I: Congenital Heart Diseases	5
- CHAPTER II: Malnutrition in under Five Children	34
- CHAPTER III: Nutrition in under Five Children with Congenital Heart Disease	83
SUBJECTS AND METHODS	109
RESULTS	121
DISCUSSION	158
CONCLUSION & RECOMMENDATIONS	172
SUMMARY	176
REFERENCES	182
APPENDIX	209
ARABIC SUMMARY	

List of Abbreviations

AS	: Aortic Stenosis
ASD	: Atrial Septal Defect
BMI	: Body Mass Index
CDC	: Center for Disease Control and prevention
CHD	: Congenital Heart Disease
CoA	: Coarctation of the Aorta
CT	: Computed Tomography
DRI	: Dietary reference intake
ECG	: Electrocardiogram
FAO	: Food and Agriculture Organization
GERD	: Gastro-Esophageal Reflux Disease
Hb	: Hemoglobin
ICU	: Intensive Care Unit
MDGs	: Millennium Development Goals.
MRA	: Magnetic Resonance Angiography
MRI	: Magnetic Resonance Imaging
MS	: Mitral Stenosis
MUAC	: Mid-Upper Arm Circumference
PDA	: Patent Ductus Arteriosus
PS	: Pulmonary Stenosis
RDA	: Recommended dietary allowances
REE	: Resting Energy Expenditure

TEE	: Total Energy Expenditure
TGA	: Transposition of the Great Arteries
TIBC	: Total iron binding capacity
TOF	: Tetralogy of Fallot
TR	: Tricuspid Regurge
TSF	: Triceps Skin Fold thickness
TTE	: Trans-Thoracic Echocardiography
UN	: United Nations
UNICEF	: United Nations Children's Fund
VSD	: Ventricular Septal Defect
WHO	: World Health Organization

List of Figures

<i>Fig. No.</i>	<i>Title</i>	<i>Page No.</i>
FIGURES OF REVIEW		
I	The total number of live births with CHD.	8
II	Causal framework for child malnutrition.	45
III	Defining malnutrition in hospitalized children.	47
VI	WHO child growth standards for weight-for-age of under five boys.	55
V	WHO child growth standards for weight-for-age of under five girls.	56
VI	WHO child growth standards for height-for-age of under five boys.	56
VII	WHO child growth standards for height-for-age of under five girls.	57
VIII	Showing (a) Length measurement in infants, two personnel have to perform it. (b) Height measurement in older children using a stadiometer. (c) Weight measurement in infants.	59
IX	Showing the weight measurement of older children only in light clothing using regularly maintained and calibrated scale.	60
X	Showing the proportional mortality in children younger than five years old.	64
XI	Showing MyPyramid Food Guide.	79
XII	Showing the appropriate way in management of CHD children nutritionally.	101
FIGURES OF RESULTS		
1.	Showing the age distribution according to age groups of our studied cases.	124
2.	Showing the geographical distribution of the patients included in our study.	125

<i>Fig. No.</i>	<i>Title</i>	<i>Page No.</i>
3.	Showing the distribution of different congenital anomalies in our studies.	131
4.	Showing the prevalence of anemia in the studied patients.	138
5.	Showing the weight-for-age z-score curve of the studied patients in comparison to the WHO standards.	144
6.	Showing the height-for-age z-score curve of the studied patients in comparison to the WHO standards.	145
7.	Showing the weight-for-height z-score curve of the studied patients in comparison to the WHO standards.	146
8.	Showing the BMI-for-age z-score curve of our studied patients in comparison to the WHO standards.	147

List of Tables

<i>Table No.</i>	<i>Title</i>	<i>Page</i>
TABLES OF REVIEW		
I	Showing the relative frequencies of major congenital heart lesions.	8
II	Showing common causes of malnutrition in early life.	47
III	Showing different clinical signs of malnutrition.	60
IV	Showing equations to calculate total energy requirements according to age.	66
V	Showing the recommended dietary allowances of infants and children of macronutrients.	69
VI	Showing the Dietary Reference Intakes of some micronutrients and water.	71
TABLES OF RESULTS		
1.	Distribution of Sociodemographic characteristics of the studied cases.	122
2.	Description of the nutritional knowledge of the studied cases.	126
3.	Items of the nutritional care received by the studied cases.	127
4.	Medical care received by the study cases.	129
5.	Distribution of the Congenital Heart Disease condition in the patients.	130
6.	Description of the breastfeeding condition and knowledge among the studied cases.	132
7.	Condition of Bottle feeding among the studied cases.	133
8.	Weaning Practice among studied cases.	134
9.	Current Feeding among the studied cases.	135
10.	Vaccination and supplementation status and knowledge among the studied group.	136
11.	Showing the prevalence of malnutrition in the studied cases	137
12.	Showing the distribution and severity of malnutrition	137
13.	Descriptive data of the included patients	139
14.	Intake of Protein group in the studied cases.	140

<i>Table No.</i>	<i>Title</i>	<i>Page</i>
15.	Intake of Carbohydrate group in the studied cases.	141
16.	Intake of Fat in the studied cases.	141
17.	Intake of milk and dairy products in the studied cases.	142
18.	Intake of beverages in the studied group.	142
19.	Intake of desserts in the studied group.	143
20.	Showing the weight-for-age % distribution in the studied cases	144
21.	Showing the length/height-for-age % distribution in our studied patients	145
22.	Showing the weight-for-height % distribution of the studied patients	146
23.	Showing the distribution of the BMI-for-age % of the studied patients.	147
24.	Showing the correlation of malnutrition status with the weight at birth, mother education, living conditions and anemia	149
25.	Showing the correlation of underweight status with weight at birth, mother education, living conditions and anemia	150
26.	Showing the correlation between the stunting with weight at birth, mother education, living conditions and anemia	150
27.	Showing the correlation between the wasting with weight at birth, mother education, living conditions and anemia	151
28.	Showing the correlation of malnutrition with age, breastfeeding duration, Hb%, serum iron, TIBC, nutrition % score with showing their means and standard deviations	151
29.	Showing the correlation between malnutrition and different factors that might affect the nutritional status of the studied patients	152
30.	Showing the correlation of Hb% & iron profile with demographic & anthropometric measures.	155
31.	Showing the correlation of Duration of breastfeeding with anthropometric measures.	156
32.	Showing the correlation of nutrition % score with demographics, anthropometric measures, Hb% & iron profile.	157

Important Definitions

Malnutrition: nutritional disorders in all their forms (including imbalances in energy, specific macronutrients and micronutrients, and dietary patterns). Conventionally, the emphasis has been on inadequacy, but malnutrition also applies to excess and imbalanced intakes. It occurs when the intake of essential macronutrients and micronutrients does not meet or exceeds the metabolic demands for those nutrients. Metabolic demands vary with age and other physiological conditions, they are also affected by environmental conditions, including poor hygiene and sanitation. (*WHO, 2013*).

Child stunting: height-for-age < 2 standard deviations below the WHO child growth standard median for children aged under 5 years. Stunting becomes a public health problem when $\geq 20\%$ of the population is affected. (*WHO, 2013*).

Child underweight: weight-for-age < 2 standard deviations below the WHO child growth standard median for children aged under 5 years. Underweight becomes a public health problem when $\geq 10\%$ of the population is affected. (*WHO, 2013*).

Child wasting: weight-for-height < 2 standard deviations below the WHO child growth standard median for children aged under 5 years. Wasting becomes a public health problem when $\geq 5\%$ of the population is affected. (*WHO, 2013*).

Anthropometry: The science of measuring the size, weight and proportions of the human body. (*Hammond, 1998*)

Food frequency questionnaire: A method of dietary assessment in which the data collected relate to how often and in what amounts food items are consumed. (*Hammond, 1998*).

Anemia: a condition in which the number of red blood cells or their oxygen-carrying capacity is insufficient to meet physiological needs, which vary by age, altitude, gender, pregnancy status and smoking status. (*WHO, 2013*).

Low birth weight: weight at birth < 2500 g. (*WHO, 2013*).

Food and nutrition security: the situation in which all people at all times have physical, social and economic access to food that is safe, consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life. (*WHO, 2013*).

Recommended Dietary Allowance (RDA): The average daily dietary nutrient intake level sufficient to meet the nutritional requirements of nearly all (97-98%) healthy persons in a particular life stage and gender group. (*More, 2013*).

Estimated Energy Requirement (EER): The average dietary energy intake that is predicted by energy balance in a healthy adult of a defined age, gender, weight, height, and level of physical activity that is consistent with good health. In children, the EER is taken to include the needs associated with the deposition of tissues at rates consistent with good health. (*More, 2013*).

Dietary reference intake (DRI): A set of values for the dietary nutrient intakes of healthy people in the U.S. and Canada, used for planning and assessing diets. Includes the Recommended Dietary Allowance (RDA), the Adequate Intake (AI), the Tolerable Upper Limit (TUL), and the Estimated Average Intake (EAI). (*More, 2013*).

Nutrition education: any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and wellbeing. It is delivered through multiple venues and involves activities at the individual, community and policy levels. (*Contento, 2007*).