



Research Paper

A Study To Assess The Malnutrition Level From Gomez 'S Classification Among Under Five Children At Kalitheerthalkuppam, Puducherry

K. DEEPALAKSHMI ¹, M. SINDHU BARATHI ²,
Dr. G. MUTHAMILSLEVI ³

¹Assistant Professor in Department of Child Health Nursing, SMVNC, Puducherry

²B.Sc., (Nursing)-IV Year, Sri Manakula Vinayagar Nursing College, Puducherry

³Principal, Sri Manakula Vinayagar Nursing College, Puducherry-605 107

Corresponding Author: K. Deepalakshmi Email: deepalakshmi@smvnc.ac.in

ABSTRACT:

Introduction: Malnutrition is a condition where the body does not receive the necessary food nutrients in their right proportions, including vitamins, minerals, proteins, carbohydrates, fats, and lipids needed for maintaining healthy tissues and organ function. It is a category of diseases that includes undernutrition and overnutrition, with nearly one in three persons globally having at least one form of malnutrition: wasting, stunting, vitamin or mineral deficiency, overweight, obesity, or diet-related noncommunicable diseases. **Objectives of the study:** The main objective of the study to assess the malnutrition level from Gomez 's classification among under five children.

Methodology: The research approach used for this study was quantitative research approach. A descriptive research design was adopted for this present study. By using convenient sampling technique, 60 under five children were selected for the present study. **Results:** The present study reveals that majority 27 (45%) of them had Grade I (Mild Malnutrition), 10 (16.7%) of them had Grade – II (Moderate Malnutrition), 1 (1.7%) of them had Grade-III (Severe Malnutrition) and 22 (36.7%) of them had obesity among under-five children. **Conclusion:** The study findings concluded that most of the under five children had Grade-I (Mild Malnutrition). There is significance association between education status of father and socio-economic status with malnutrition level from Gomez 's classification among under five children where $p < 0.05$.

Keywords: Malnutrition, Gomez 's classification, under five children

I. INTRODUCTION:

Malnutrition is a condition that develops when the body does not get the require food nutrients in their right proportions. Such food nutrients include vitamins, minerals, proteins, carbohydrate and fat and lipids it needs to maintain healthy tissues and organ function.

Malnutrition occurs when an organism gets too few or too many nutrients, resulting in health problems. Specifically, it is "a deficiency, excess, or imbalance of energy, protein and other nutrients" which adversely affects the body's tissues and form. Malnutrition is not receiving the correct amount of nutrition. Malnutrition is increasing in children under the age of five due to providers who cannot afford or do not have access to adequate nutrition.

Malnutrition is a category of diseases that includes undernutrition and overnutrition. Undernutrition is a lack of nutrients, which can result in stunted growth, wasting, and underweight. A surplus of nutrients causes overnutrition, which can result in obesity. In some developing countries, overnutrition in the form of obesity is beginning to appear within the same communities as undernutrition. It is estimated that nearly one in three persons globally has at least one form of malnutrition: wasting, stunting, vitamin or mineral deficiency, overweight, obesity, or diet-related noncommunicable diseases.

Gomez classification One of the earliest systems for classifying protein- energy malnutrition in children, based on percentage of expected weight for age: over 90% is normal, 76–90% is mild (first degree) malnutrition, 61–75% is moderate (second degree) malnutrition and less than 60% is severe (third degree) malnutrition.

Waterlow's system combines weight-for-height (indicating acute episodes of malnutrition) with height-for-age to show the stunting that results from chronic malnutrition. One advantage of the Waterlow classification is that weight for height can be calculated even if a child's age is unknown. over 90% is normal, 80–90% is mild

(Grade I) malnutrition, 70–80% is moderate (Grade II) malnutrition and less than 70% is severe (Grade III) malnutrition.

WHO classification indicators are defined as follows stunting – height-for-age ≤ -2 SD of the WHO Child growth standards median; wasting – weight-for-height ≤ -2 SD of the WHO Child growth standards median; and overweight – weight-for-height $\geq +2$ SD of the WHO Child growth standards median. underweight – weight-for-age ≤ -2 standard deviations (SD) of the WHO Child growth standards median. Stunting indicators as follows $<2.5\%$: very low, 2.5 to $<10\%$: low, 10 to $<20\%$: medium, 20 to $<30\%$: high, $\geq 30\%$: very high. Wasting indicators as $<2.5\%$: very low, 2.5 to $<5\%$: low, 5 to $<10\%$: medium, 10 to $<15\%$: high, $\geq 15\%$: very high

Undernutrition can occur either due to protein-energy wasting or as a result of micronutrient deficiencies. It adversely affects physical and mental functioning, and causes changes in body composition and body cell mass. Undernutrition is a major health problem, causing the highest mortality rate in children, particularly in those under 5 years, and is responsible for long-lasting physiologic effects. It is a barrier to the complete physical and mental development of children.

Undernutrition can manifest as stunting, wasting, and underweight. If undernutrition occurs during pregnancy, or before two years of age, it may result in permanent problems with physical and mental development. Extreme undernutrition can cause starvation, chronic hunger, Severe Acute Malnutrition (SAM), and/or Moderate Acute Malnutrition (MAM). Undernutrition' sometimes refers specifically to protein–energy malnutrition (PEM). This condition involves both micronutrient deficiencies and an imbalance of protein intake and energy expenditure. It differs from calorie restriction in that calorie restriction may not result in negative health effects. Hypoalimantation (underfeeding) is one cause of undernutrition.

Two forms of PEM are kwashiorkor and marasmus; both commonly coexist. Kwashiorkor is primarily caused by inadequate protein intake. Its symptoms include oedema, wasting, liver enlargement, hypoalbuminemia, and steatosis; the condition may also cause depigmentation of skin and hair. Marasmus can result from a sustained diet that is deficient in both protein and energy. The primary symptoms are severe wasting, leaving little or no oedema; minimal subcutaneous fat; and abnormal serum albumin levels. It is traditionally seen in cases of famine, significant food restriction, or severe anorexia. Conditions are characterized by extreme wasting of the muscles and a gaunt expression.

There are three types of protein- energy malnutrition in children described as acute malnutrition is wasting or thinness, acute inadequate nutrients leading to rapid weight loss or failure to gain weight normally. Chronic malnutrition refers to shortness caused by inadequate nutrition over a long period of time leading to failure in linear growth. Wasting and stunting are very different forms of malnutrition. Stunting is chronic and its causative factors are poorly understood. Some signs and symptoms may include weight loss, breathing difficulties, higher susceptibility to cold and other diseases, higher risk of hypothermia. Severely malnourished children typically experience slow behavioural development; even mental retardation may occur.

Malnutrition is when the body does not get the require foods nutrients in their right proportions. Such food nutrients include vitamins, minerals, protein. Carbohydrates, fats and lipids need to maintain healthy tissues and organ function. Good nutrition early in life is a key input for human capital formation, the fundamental for sustainable and equitable economic growth. Any major deviation in the intake either the quality or quantity form these requirements can affect growth in many ways. Child under nutrition is the leading cause of burden of disease. Many women do not prepare their children a balanced meal may be due to lack of knowledge or financial problems. Lack of good nutritional requirements lead to poor growth of the child, poor intellectual reasoning, frequent infections and consequently dead.

In 1956, Gómez and Galvan studied factors associated with death in a group of undernourished children in a hospital in Mexico City, Mexico. They defined three categories of malnutrition: first, second, and third degree. The degree of malnutrition is calculated based on a child's body size compared to the median weight for their age. The risk of death increases with increasing degrees of malnutrition.

An adaptation of Gomez's original classification is still used today. While it provides a way to compare malnutrition within and between populations, this classification system has been criticized for being "arbitrary" and for not considering overweight as a form of malnutrition. Also, height alone may not be the best indicator of malnutrition; children who are born prematurely may be considered short for their age even if they have good nutrition.

Gomez classification One of the earliest systems for classifying protein- energy malnutrition in children, based on percentage of expected weight for age: over 90% is normal, 76–90% is mild (first degree) malnutrition, 61–75% is moderate (second degree) malnutrition and less than 60% is severe (third degree) malnutrition.

NEED FOR THE STUDY

In 2021, 148.1 million children under five years old were stunted, 45 million were wasted, and 37 million were overweight or obese. The same year, an estimated 45% of deaths in children were linked to undernutrition.

As of 2020, the prevalence of wasting among children under five in South Asia was reported to be 16% moderately or severely wasted. As of 2022, UNICEF reported this prevalence as having slightly improved, but still being at 14.8%.

In Asia, India has one of the highest burdens of wasting with over 20% wasted children. However, the burden of undernutrition among under-five children in African countries is much higher. A pooled analysis of the prevalence of chronic undernutrition among under-five children in East Africa was identified to be 33.3%. This prevalence of undernutrition among under-five children ranged from 21.9% in Kenya to 53% in Burundi. In Tanzania, the prevalence of stunting, among children under five varied from 41% in lowland and 64.5% in highland areas. Undernutrition by underweight and wasting was 11.5% and 2.5% in lowland and 22. % and 1.4% in the highland areas of Tanzania respectively. In South Sudan, the prevalence of undernutrition explained by stunting, underweight and wasting in under-five children were 23.8%, 4.8% and 2.3% respectively. In 28 countries, at least 30% of children were still affected by stunting in 2022.

According to the study by Sanjay Quraishi et al. (2019) on prevalence and determinants of undernutrition among under-five children residing in urban slums and rural area, Maharashtra, India. Total 2929 mothers and their 3671 under five children were covered. Overall prevalence of stunting among children under five was 45.9%, wasting was 17.1 and 35.4% children were underweight. Prevalence of wasting, stunting and underweight were more seen in an urban slum than a rural area. In the rural areas exclusive breast feeding ($p < 0.001$) and acute diarrhea ($p = 0.001$) were associated with wasting, children with birth order 2 or less than 2 were associated with stunting and exclusive breast feeding ($p < 0.05$) and low maternal education were associated with underweight. Whereas in the urban slums exclusive breast feeding ($p < 0.05$) was associated with wasting, sex of the child ($p < 0.05$) and type of family ($p < 0.05$) were associated with stunting, and low income of the family ($p < 0.05$) was associated with underweight.

Jasmine Sharmila et al. (2020) conducted a study on prevalence and determinants of under-nutrition among 210 children aged 5-10 years in an urban area of Kancheepuram district, Tamil Nadu. Prevalence of underweight among children was found to be 52.4% of which 58.5% of the undernourished children were boys when compared to 47.4% among girls. Underweight was significantly associated with source of drinking water [$p < 0.0125$], OR=2.0566], episode of diarrhoea [$p < 0.0054$], OR=2.3624] and ARI [$p < 0.0000$], OR= 8.6417] in the last 3 months, history of passing worms [$p < 0.0348$], OR=1.8878], meal frequency < 3 times/day [$p < 0.0000$], OR=7.5432]. Half of the children (52.4%) in the study had poor nutritional status. To combat under-nutrition good living conditions, education to the mothers, clean water source, good personal hygiene, period deworming and delivery of integrated programs are recommended.

Yuvaraj Krishnamoorthy et al. (2018) conducted a study on Prevalence of malnutrition and its associated factors among elderly population in rural Puducherry. Among 279 participants, 178 (63.8%) were in the age group of 60-70 years, 190 (68.1%) were females, and 208 (74.6%) had no formal-education. Prevalence of malnutrition among elderly was found to be 17.9% (95% CI: 13.7-22.7) and about 58.8% (95% CI: 52.9-64.4) were at risk of malnutrition which was assessed using MNA questionnaire. Prevalence of obesity was found to be 32.5% (95% CI: 27.3-38.3) and 38.4% had inadequate fruits and vegetables intake. About 250 (89.6%) are living independently according to ADL score.

The investigation during paediatric posting clinical presentation, care study Gomez classification used to assess malnutrition to test the tool is effect or not. So, this study was conducted to assess the malnutrition level from Gomez 's classification among under five children at Kalitheerthalkuppam Puducherry

STATEMENT OF THE PROBLEM

A study to assess the malnutrition level from Gomez 's classification among under five children at Kalitheerthalkuppam, Puducherry

OBJECTIVES OF THE STUDY

- To assess the malnutrition level from Gomez 's classification among under five children
- To associate the malnutrition level from Gomez 's classification among under five children with selected demographic variables.

II. RESEARCH METHODOLOGY:

RESEARCH APPROACH:

A quantitative research approach was adopted for the present study.

RESEARCH DESIGN:

A descriptive research design was adopted for the present study.

SETTING OF THE STUDY:

The present study was conducted in Kalitheerthalkuppam, Puducherry

POPULATION:

The study population consist of all under five children.

SAMPLE:

The sample of the study consist of all under five children at Kalitheerthalkuppam, Puducherry, who meet the inclusion criteria.

SAMPLE SIZE:

The sample size consists of 60 under five children at Kalitheerthalkuppam, Puducherry.

SAMPLE TECHNIQUE:

A convenient sampling technique was used to select the sample for the present study.

SAMPLE SELECTION CRITERIA:

Inclusion criteria:

1. Under five children at Kalitheerthalkuppam, Puducherry.
2. Under five children who could speak Tamil / English.

Exclusion criteria:

Under five children who are not willing to participate in this study

MAJOR FINDING

Regarding the age in years, the majority 10 (33.3%) were in the age group of 21-30 years, 13(43.3%) were in the age group of 31-40 years and 4 (13.3%) were in the age group of 41-50 years. With regards to gender, majority 22 (73.3%) were male and 8 (26.7%) were female. In the aspect of education status, the data shows majority 13 (43.3%) were uneducated and 1 (3.3%) were completed primary level. In the aspect of occupation status majority, 30 (100%) were private employed. In the aspect of religion majority, 28 (93.3%) were Hindu, 1 (3.3%) were Muslim and 1 (3.3%) were Christian. Regarding income per month, the data shows that the majority 13 (43.3%) come under Rs.9001 to Rs.15000 and 9 (30%) were come under Rs. 15000/- to Rs20000/-. With regards to marital status majority, 22 (73.3%) were married and 8 (26.7%) were single. In the aspect of type of family, 12 (40%) had 3-6 years of experience and 6 (20%) had below 3 years of experience. With regards to history of occupation lung disease majority 17 (56.7%) had previous history and 13 (43.3%) had no previous history.

III. RESULTS AND DISCUSSION

Table 1: Distribution of the malnutrition level from Gomez 's classification among under five children.

N=60

S.NO	LEVEL OF MALNUTRITION	FREQUENCY (n)	PERCENTAGE %
1.	Obesity	22	36.6%
2.	Grade-I (Mild Malnutrition)	27	45%
3.	Grade – II (Moderate Malnutrition)	10	16.7%
4.	Grade – III (Severe Malnutrition)	1	1.7%

The table 1 reveals the distribution of the malnutrition level from Gomez 's classification among under five children. The finding shows that, majority 27 (45%) of them had Grade I (Mild Malnutrition), 10 (16.7%) of them had Grade – II (Moderate Malnutrition, 1 (1.7%) of them had Grade-III (Severe Malnutrition) and 22 (36.7%) of them had obesity among under-five children.

The above table 2 shows that there is significance association between education status of father with malnutrition level from Gomez 's classification among under five children where $p < 0.05$.

Figure 1: Percentage wise distribution of malnutrition level from Gomez 's classification among under five children.

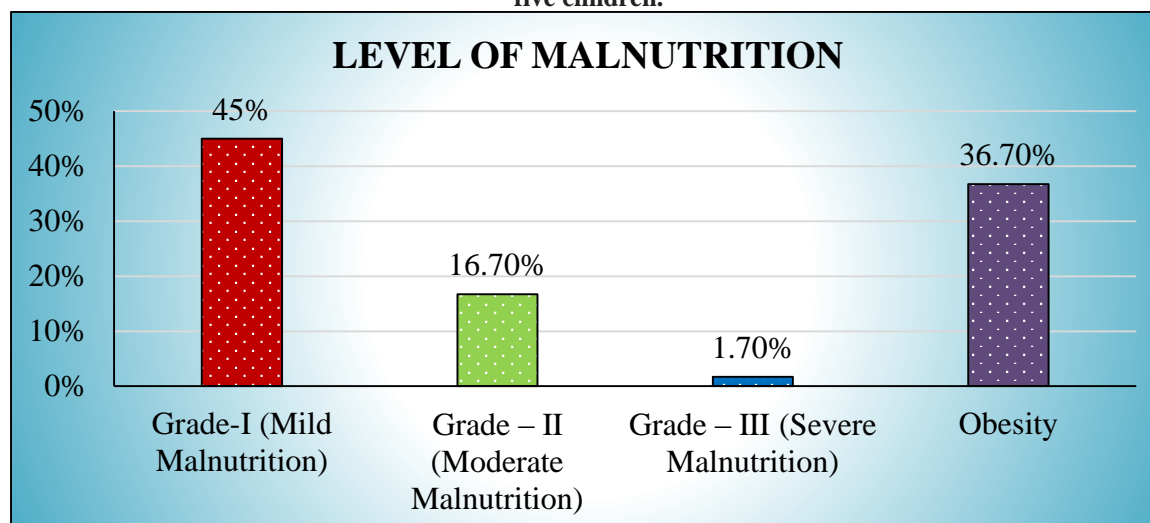


Table 2: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
1	Age	N	%	N	%	N	%	N	%	X ² = 10.461 P= 0.315 (NS)
	a) 2- years	9	18	6	12	1	2	9	18	
	b) 3- years	2	4	0	0	0	0	5	10	
	c) 4- years	11	22	4	8	0	0	7	14	
	d) 5- years	5	10	0	0	0	0	1	2	
2.	Gender									X = 0.641 P= 0.887 (NS)
	a) Male	18	36	7	14	1	2	14	28	
	b) Female	9	18	3	6	0	0	8	16	
3.	Educational status of father									X ² = 16.183 p = 0.03 (S)*
	a) Illiterate	5	10	0	0	0	0	0	0	
	b) Primary school	2	4	1	2	1	2	2	4	
	c) High school	8	16	3	6	0	0	6	12	
	d) Graduate	12	24	6	12	0	0	14	28	

Table 3: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables. N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
4.	Educational status of mother									X ² =4.118 p = 0.661 (NS)
	a) Illiterate	0	0	0	0	0	0	0	0	
	b) Primary school	10	20	2	4	0	0	4	8	
	c) High school	9	18	4	8	1	2	10	20	
	d) Graduate	8	16	4	8	0	0	8	16	
5	Father Occupation									

	a) Private employee	13	26	4	8	1	2	4	8	X ² = 9.731 p = 0.373 (NS)
	b) Self-employee	10	20	4	8	0	0	10	20	
	c) Government employee	4	8	1	2	0	0	7	14	
	d) Unexplained	0	0	1	2	0	0	1	2	

*p<0.05 - Significant; p<0.01 - Highly Significant

Table 3: The above table shows that there is no significance association between educational status of mother, father occupation with malnutrition level from Gomez 's classification among under five children.

Table 4: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables

N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
6	Mother occupation									X ² = 7.720 p = 0.563 (NS)
	a) Private employee	14	28	2	4	1	2	9	18	
	b) Self-employee	5	10	1	2	0	0	4	8	
	c) Government employee	1	2	0	0	0	0	1	2	
	d) Unexplained	7	14	7	14	0	0	8	16	
7	Religion									X ² =5.268 p = 0.810 (NS)
	a) Hindu	19	38	9	18	1	2	18	36	
	b) Muslim	7	14	1	2	0	0	2	4	
	c) Christian	0	0	0	0	0	0	1	2	
	d) Others	1	2	0	0	0	0	1	2	
8	Residency									X ² =3.164 p = 0.957 (NS)
	a) Rural	14	28	6	12	1	2	10	20	
	b) Semi-rural	10	20	3	6	0	0	8	16	
	c) Urban	0	0	0	0	0	0	1	2	
	d) Semi urban	3	6	1	2	0	0	3	6	

*p<0.05 - Significant; p<0.01 - Highly Significant

Table 4: The above table shows that there is no significance association between mother occupation, religion and residency with malnutrition level from Gomez 's classification among under five children.

Table 5: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables

N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
9	Family Income									X ² =5.142 p = 0.822 (NS)
	a) Rs 1000-5000	8	16	2	4	0	0	2	4	
	b) Rs.6000-10,000	4	8	1	2	0	2	3	6	
	c) Rs.11000-15000	9	18	4	8	1	0	11	22	
	d) Above 15000	6	12	3	6	0	0	6	12	
10	Socio economic status									X ² = 7.074 p = 0.029 (S)*
	a) Poor	3	6	1	2	0	0	3	6	
	b) Mild	12	24	4	8	0	2	7	14	
	c) Moderate	12	24	4	8	1	0	12	24	
	d) Severe	0	0	1	2	0	0	0	0	
11	Type of family									X ² =4.097 p = 0.905 (NS)
	a) Nuclear	12	24	6	12	1	0	13	26	
	b) Extended	12	24	4	8	0	0	7	14	
	c) Single parent	2	4	0	0	0	0	2	4	
	d) Grand parent	1	2	0	0	0	0	0	0	

*p<0.05 - Significant; p<0.01 - Highly Significant

Table 5: The above table shows that there is significance association between socio-economic status with malnutrition level from Gomez 's classification among under five children where p<0.05.

Table 6: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables

N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
12	Child weight at birth									X ² =12.648 p = 0.179 (NS)
	a) 1000 g	2	4	2	4	0	0	0	0	
	b) 1500 g	4	8	0	0	0	2	0	0	
	c) 2500 g	6	12	2	4	1	0	7	14	
	d) Above 2500 g	15	30	6	12	0	0	15	30	
13	Child weight at present									

a) 6-8kg	2	4	1	2	0	0	0	0	X ² =6.544 p = 0.684 (NS)
b) 8-10kg	7	14	4	8	0	0	4	8	
c) 10-12kg	9	18	3	6	1	2	8	16	
d) 6-8kg	9	18	2	4	0	0	10	20	

*p<0.05 - Significant; p<0.01 - Highly Significant

Table 6: The above table shows that there is no significance association between child weight at birth and child weight at present with malnutrition level from Gomez 's classification among under five children.

Table 7: Association of the malnutrition level from Gomez 's classification among under five children with their selected demographic variables

N = 60

S.No	Demographic variables	LEVEL OF MALNUTRITION								X ² value
		Grade 1		Grade 2		Grade 3		Obesity		
14	Medical illness of child									X ² =5.535 p = 0.785 (NS)
	a) Pneumonia	6	12	5	10	0	0	5	10	
	b) Diabetes mellitus	4	8	1	2	0	0	4	8	
	c) Thyroid	3	6	0	0	0	0	1	2	
	d) None of the above	14	28	4	8	1	2	12	24	
15	Dietary pattern									X ² =2.848 p = 0.416 (NS)
	a) vegetarian	5	10	0	0	0	0	5	10	
	b) Non vegetarian	22	44	10	20	1	2	17	34	
16	Number of children									X ² =2.091 p = 0.554 (NS)
	a) 0-1 child	7	14	1	2	0	0	7	14	
	b) 2-3 children	20	40	9	18	1	2	15	30	
	c) 4-5 children	0	0	0	0	0	0	0	0	
	d) above 5 children	0	0	0	0	0	0	0	0	

*p<0.05 - Significant; p<0.01 - Highly Significant

Table 7: The above table shows that there is no significance association between medical illness, dietary pattern and number of children with malnutrition level from Gomez 's classification among under five children.

IV. CONCLUSION:

The study findings concluded that most of the under five children had Grade-I (Mild Malnutrition). There is significance association between education status of father and socio-economic status with malnutrition level from Gomez 's classification among under five children where p<0.05.

RECOMMENDATIONS:

- Same study can be conducted with large samples.
- Same study to can be conducted among school children in community area.

JOURNAL REFERENCE

- [1]. Karam, Madhu, et al. "Malnutrition Status and Other Common Comorbidities among Inmates of Childcare Homes in Puducherry, India - An Analytical Cross-Sectional Study." *Clinical Epidemiology and Global Health*, Elsevier BV, Oct. 2021, p. 100837. Crossref, doi:10.1016/j.cegh.2021.100837.
- [2]. Sahu, SwaroopKumar, et al. "Prevalence of Malnutrition and Its Associated Sociodemographic and Clinical Factors among Adolescents in Selected Schools of Urban Puducherry, India." *Nigerian Postgraduate Medical Journal*, no. 4, Medknow, 2021, p. 285. Crossref, doi:10.4103/npmj.npmj_684_21.
- [3]. M. K., Jasmine Sharmila, et al. "Prevalence and Determinants of Under-Nutrition among Children Aged 5-10 Years in an Urban Area of Kancheepuram District, Tamil Nadu." *International Journal of Community Medicine And Public Health*, no. 11, Medip Academy, Oct. 2020, p. 4449. Crossref, doi:10.18203/2394-6040.ijcmph20204744.
- [4]. Nambile Cumber, Samuel. "Mothers' Knowledge on the Effects of Malnutrition in Children 0-5 Years in Muea Health Area Cameroon." *Journal of Family Medicine and Health Care*, no. 4, Science Publishing Group, 2016, p. 36. Crossref, doi:10.11648/j.fjmhc.20160204.13.
- [5]. Fadare, Olusegun, et al. "Mother's Nutrition-Related Knowledge and Child Nutrition Outcomes: Empirical Evidence from Nigeria." *PLOS ONE*, edited by Sukumar Vellakkal, no. 2, Public Library of Science (PLoS), Feb. 2019, p. e0212775. Crossref, doi:10.1371/journal.pone.0212775.

- [6]. Goyal, Mohit, et al. "Assessment of Nutritional Status of Under-Five Children in an Urban Area of South Delhi, India." *Cureus*, Cureus, Inc., Feb. 2023. Crossref, doi:10.7759/cureus.34924.
- [7]. Dhungana, Govinda Prasad. "Nutritional Status Of Under 5 Children And Associated Factors Of Kunchha Village Development Committee." *Journal of Chitwan Medical College*, no. 4, Chitwan Medical College, Jan. 2014, pp. 38–42. Crossref, doi:10.3126/jcmc.v3i4.9553.
- [8]. Sahu, SwaroopKumar, SGanesh Kumar, et al. "Malnutrition among Under-Five Children in India and Strategies for Control." *Journal of Natural Science, Biology and Medicine*, no. 1, EManuscript Technologies, 2015, p. 18. Crossref, doi:10.4103/0976-9668.149072.
- [9]. "Tolunay, Orkun. "Effect of Malnutrition on the Length of Stay in Hospitalized Children." *Türk Pediatri Arşivi, AVES YAYINCILIK A.Ş.*, 2020. Crossref, doi:10.14744/turkpediatriars.2020.46354.
- [10]. f10.Govender, Indiran, et al. "Malnutrition in Children under the Age of 5 Years in a Primary Health Care Setting." *South African Family Practice*, no. 1, AOSIS, Sept. 2021. Crossref, doi:10.4102/safp.v63i1.5337.