

## Assessment of Mothers' Knowledge and Practices Regarding Care of Their Infants Suffering from Failure to Thrive

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### Abstract

**Background:** Failure to thrive describes an infant or child who does not gain weight at the expected rate. The current study's objective was to evaluate mothers' expertise and practices regarding care of their infants suffering from failure to thrive. **Research design:** A descriptive research design was used. **subjects:** One hundred fifty mothers and their infants from pediatric outpatient endocrine clinic of Tanta University Hospital and outpatient follow up clinic of Urban medical center of Sidi Salem, Kafr El Sheikh were included. **Three Tools** were used to collect the required data: Structured interview schedule to obtain socio-demographic characteristics of studied mothers and their infants, observational checklist to assess mothers' feeding practice related to care of their infants with failure to thrive and nutritional assessment sheet to assess infant' growth. **The results** revealed that, most of mothers who had low and moderate level of knowledge had unsatisfactory practices. Between mothers' knowledge and practice there is no statistically significant difference. The relationship between mothers' knowledge and their demographic data was statistically significant. **Conclusion:** there were statistically significant difference between total mothers' knowledge and practice scores of mothers about failure to thrive and feeding pattern, there were significant relation between mothers' knowledge and their demographic data. **Recommendations:** the current study recommended that, in service educational program about failure to thrive and feeding patterns should be conducted at endocrine clinic to mothers of infant with failure to thrive and nurses. Mothers and nurses should have access to a manual logbook about how to care for infants who are failing to thrive in order to improve their practises in endocrine clinic as a reference and further study should be conducted about failure to thrive.

**Key words:** Failure to thrive , Knowledge, Mothers, Practice, Infant

## Introduction

The first month of life through the end of the 12th month of life is considered infancy. Infants grow and develop quickly during this time. Good nutrition throughout infancy and early childhood promotes healthy growth and development, which in turn reduces the risk of illness and premature death. An infant's nutritional, physical, and mental health may all suffer from inadequate feeding in the first year of life. Proper nourishment is essential for regular development, health and recovery. Between the ages of 6 and 12 months bioavailable nutrients mostly come from breastmilk or baby formula<sup>(1)</sup>.

Failure to thrive is defined as infant gaining weight at a rate that is lower than normal for their age and sex. It is frequently applied to infants who don't grow in height or weight in accordance with accepted medical growth charts. FTT happens when an infant is not getting enough calories or is unable to use the calories that are given, which prevents them from gaining weight or growing over time. A diagnosis of FTT is made when an infant's weight or height is below the third percentile for their age or when the rate of weight gain or height increase gradually slows down<sup>(2,3)</sup>.

Infants from low-income families are more likely to experience failure to thrive, which is also linked to lower parental education levels. Children under the age of two years are admitted to the hospital due to failure to thrive between 3-5% of all hospital admissions. According to historical data, boys are slightly more likely than females to be hospitalised due to

failure to thrive (53.2 percent males and 46.7 percent females). According to the United Nations Children's Fund, 2.7% of Egyptian children are suffering from failure to thrive<sup>(4,5)</sup>.

There are three types of failure to thrive: organic, nonorganic, and mixed. An acute or chronic disorder that affects nutrient intake, absorption, metabolism, excretion, or that raises energy needs can be the cause of organic failure to thrive. Nonorganic FTT is brought on by insufficient calorie intake, which typically shows up as failure to gain weight. Growth in length and head circumference initially proceed normally before being impacted by inadequate calorie intake. Organic and inorganic causes may overlap in a mixed FTT. Infants with organic disorders, for instance, may grow up in unbalanced environments or with dysfunctional parent-child relationships. Similarly, infants with severe undernutrition brought on by nonorganic factors may experience organic medical problems<sup>(6,7,8)</sup>.

There are several potential causes including insufficient calorie intake, malabsorption/caloric retention issues and increased metabolic requirements. If infant not getting enough food and nutrients into his body, it might be because of a shortage of food, because of physical variations that make eating difficult or because of psychological or social factors that make infant less hungry<sup>(9)</sup>.

Infants who fail to thrive exhibit the symptoms such as lack of weight gain, delays in reaching developmental milestones, such as rolling over, crawling, and talking and learning

disabilities. Also, they exhibit lack of emotions, such as smiling, laughing, or making eye contact, delayed motor development, fatigue, and irritability. On growth curves, growth variables like height and weight do not increase as expected, more sleepiness than normal and no vocal sound<sup>(10)</sup>.

Failure to thrive can be diagnosed through prenatal, postnatal, past medical and feeding histories to assess total caloric intake. Family history, psychosocial history developmental history and tests that include blood tests, urine tests, X-rays, developmental screenings and a chart with ideal height and weight ranges for infants to help monitor infants' growth. It is frequently advised to use growth charts for kids under 24 months to evaluate their potential for FTT. The WHO growth charts examine children's growth for any potential abnormal or unhealthy growth to define abnormal growth<sup>(11,12)</sup>.

Failure to thrive is treated according to the severity of the symptoms, the infant's general health, the parents' or caregivers' preferences, the family environment, and the underlying cause of the condition. In order to treat infants who don't thrive ensuring that they eat enough calories to support their growth. Any potential causes of poor weight gain were also discussed by the care team. The primary care physician, a registered dietitian, occupational therapists to assist with sensory or coordination problems, speech therapists to assist with any sucking or swallowing problems, a social worker if a family struggles to provide enough food, psychologists

and other mental health professionals for any behavioural issues and specialists like a cardiologist, neurologist or gastroenterologist to treat health conditions that may affect on infant are all possible members of infant's care team<sup>(13)</sup>.

Infants with failure to thrive may have normal growth if they get therapy early, but not receiving treatment may have serious consequences. Symptoms of this disorder include cognitive and emotional impairment, stunted physical growth, nutrient shortages (particularly iron and vitamin D), and delayed development<sup>(14)</sup>.

Nurse plays an important role through observing and evaluating infant's condition by growth and daily weight chart. Nurses maintain enough food and liquids to stay infant healthy. Nurses are responsible for informing parents and other caregivers about nutrient deficiencies<sup>(15)</sup>.

#### **Aim of the Study**

This study's objective was to:-

Assess mothers' knowledge and practices regarding care of their Infants suffering from failure to thrive.

#### **Hypothesis**

What's mothers' knowledge and practices regarding care of their infants suffering from failure to thrive?

#### **Research design:**

A descriptive research design was used in this study.

#### **Setting:**

The study was conducted at pediatric outpatient endocrine clinic of Tanta University Hospital and outpatient follow up clinic of urban medical center of Sidi Salem, Kafr El Sheikh.

**Subjects:**

150 mothers and their infants suffering from failure to thrive from the previously mentioned settings were included in this study.

**Inclusion criteria:**

Both sexes, with non-organic failure to thrive.

**Tools of data collection:-**

Three tools were used in this study:-

**Tool I: Structured interview schedule:** It was developed by the researcher after examining recent writings<sup>(5,18)</sup>: It was composed of four parts.: **Part(1):** socio-demographic characteristics of the mothers who were being studied such as:age,educational level, occupation and residence.

b-Socio-demographic characteristic of studied infants such as: age, sex, birth order and number of children in the family.**Part (2):** Past and present medical history of infants such as: past medical history (chest , heart and blood diseases) , present medical history (constipation,diarrhea , vomiting and dairy allergy ).**Part (3):** Mothers' knowledge about failure to thrive: (meaning of failure to thrive, factors affecting, types of failure to thrive, causes, complication and management).**Part (4):** Feeding patterns of infants with failure to thrive include the following: breast feeding :( definition, importance, technique and criteria of adequate breast feeding) . Artificial feeding:( definition, indication and measure of adequate amount). Complementary and supplementary feeding of infants. Weaning of infants:( definition, principles, and correct time of starting weaning) .

Scoring system for mothers' knowledge was be scored as the following:

-Correct and complete answer was scored (2).

-Correct and incomplete answer was scored (1).

- Incorrect and don't know was scored (0).

Total scoring system for mothers' knowledge will be categorized as the following:

-High level of knowledge will be considered more than 75 %.

-Moderate level of knowledge will be considered from 50 to less than 75%

-low level of knowledge will be considered less than50%

**Tool II:** Mothers' feeding habits with regard to the care of their infant who is not thriving checklist for observation It was created by Cole S. (2011)<sup>(17)</sup> and modified by the researcher after reviewing pertinent literature. It was created to evaluate mothers' feeding practises for infants. Breastfeeding: techniques for breast feeding, including pre- and post-feeding care. preparing formula for feeding. Weaning: (time and principles of weaning.)

Scoring system for mothers' practices

-Done correctly and completely was scored(2)

-Done correctly and incomplete was scored(1)

-Not done was scored (0)

-Total scores for mothers' practice:-

-More than 60 considered satisfactory practice.

-Less than 60 Unsatisfactory practice

**Tool III:** Nutritional Assessment Sheet: It was developed by Marilyn S (2011) (14) and used by the researcher

to assess nutritional status of infant suffering from failure to thrive .General assessment sheet which included: Observation for infant general condition as (eye, lips, gums, skin, and tongue, gross, fine motor and cognitive development) through simple repetitive acts to imitative activity.

Anthropometric measurements as (weight, length, mid arm, chest, and head circumference) <sup>(17)</sup>.Body Mass Index (BMI) =weight(kg)/Height(m). Growth monitoring chart based on WHO standards of growth chart according to infant's age.

**The study was accomplished through the following steps:**

**Official permission** to conduct the study was obtained from responsible authorities of Tanta university hospital and Urbanmedical center of Sidi-Salem,Kafr El sheikh .

**Ethical considerations:**ethical committee of faculty of nursing approved was obtained.Mothers' consent was obtained to participate in the study after explaining the aim of the study. They have the right to withdraw from the study at any time. Nature of the study does not cause any harm or pain to the whole sample and Privacy and confidentiality were protected.

**Tools development:** Three tools were developed and modified by the researcher based on review of related literature.

**Content validity:** The tools were presented to a jury of seven experts in the field of pediatric nursing to check validity, reliability and applicability of the tools.

**A pilot study:** was conducted on (10%) of the selected sample to test the tool for its clarity, applicability, feasibility and the necessary modification was done accordinally. It was excluded from the study sample.

**Implementation of the study:** The researcher conducted interviews with every mother and child who met the requirements for inclusion in the study sample. The time taken for filling each sheet ranged from 30-40 minutes that is depending upon the response of the mother and the infant status.

Anthropometric measurements of the studied infants were taken by the researcher (weight, length, head and chest circumference and body mass index).

**The suitable statistical test was used for testing questionnaire reliability.**

**Statistical analysis:** the collected data were organized, tabulated, and statistically analyzed using SPSS software (Statistical Package for the Social Science, Version 16, SPSS Inc.Chicago , IL, USA) .For quantitative data, which describe acategorical set of data by frequency,percentage or proportion of each category.

**the field work was carried out through** seven-month period starting in June 2021 and ending in December 2021.

## Results

**Table (1): Percentage distribution of studied mothers according to sociodemographic characteristics and medical history during pregnancy.**

It was found that, 54.7% of studied mothers aged from 16 to less than 30 years, the mean age of studied mothers

29.34 +- 6.73. Nearly half of them (46.0%) had secondary education, while one third (33.3%) had university education. It was found that, more than two third of studied mothers (70.0%) not working and half of them (51.3%) from rural area. Regarding to medical problems during pregnancy it was found that, more than two-third (68.0%) had problems during pregnancy such as anemia,covid19,hypertension,preeclampsia and premature birth.

**Table (2): Percentage distribution of studied infants according to their demographic characteristics and type of feeding.** It was observed that , one third of studied infants (38.0%) aged from 4 to less than 8 months .Regarding to thier type of feeding it was observed that, half of studied infants (51.3) on breast feeding , 40.7% on bottle feeding , only 8.0% depending on both breast and bottle feeding .

**Table (3): Percentage distribution of mothers' knowledge about failure to thrive and feeding pattern.** It was observed that ,more than two-third (72.0%) of studied mothers gave correct but incomplete answer about definition of failure to thrive, factors 63.3%, causes 56.7% ,complication 61.3% and treatment 81.3% .It was observed that, mothers'knowledge about breast feeding gave incomplete answer about definition and importance of breast feeding 70.0% ,advantages 60.7% , indication the adequacy 68.7% , techniques 56.0% of breast feeding. Regarding to artificial feeding, most of them (83.3%) gave incomplete answer about the definition, reasons of artificial feeding

52.7% and definition of complementary feedings 60.0% . Mothers' knowledge about weaning ,two-third (61.3%) of studied mothers gave incomplete answer about the meaning and principles of weaning and time of starting weaning 64.7% .

**Table (4): Total scores of mother's level of knowledge about failure to thrive and feeding patterns.**it was observed that, slightly more than half of studied mothers (53.3%) had low level of knowledge about failure to thrive and (56.0%), (58.7%) had moderate level of knowledge about breast and artificial feeding respectively. While nearly half of mothers (48.7%) had moderate level of knowledge about weaning. Regarding to total scores of mothers' knowledge ,it was observed that, half of mothers (50.7%) had moderat level of knowledge.

**Table (5): Total scores of mothers' feeding practice to their infants with failure to thrive:**it was found that, half of studied mothers (50.0%) had unsatisfactory practice for breast feeding, slightly more than half of them (52.7%) about bottle feeding and three-quarter (77.3%) related to weaning, according to total scores of mothers' feeding practices it was found that, most of them (83.3%) had unsatisfactory practice of all feeding practices and only 16.7% had satisfactory scores .

**Table (6): Relation between total mothers' knowledge and practice about feeding patterns.** It was observed that, most of mothers (84,1%) who had low and moderate level (85.5%) of knowledge had unsatisfactory practice . while only

15.9% had satisfactory. Statistically significant difference between mothers' knowledge and practice of infant with failure to thrive.

**Table (7): Correlation between total scores of mothers' knowledge and practice about failure to thrive and feeding pattern:** It was noticed that, there were statistically significant difference between total mothers' knowledge and practice scores about failure to thrive and feeding pattern ( $P < 0.004$ ).

**Table (1):** shows the percentage distribution of the mothers who participated in the study by sociodemographic traits and prenatal medical history.

Demographic data of studied mothers and medical history during pregnancy.	The studied mothers (n=150)	
	N	%
<b>Demographic data</b>		
<b>Age years</b>		
16-<30	82	54.7
30-45	68	45.3
<b>Range</b>	16-45	
<b>Mean±SD</b>	29.34±6.73	
<b>Education level</b>		
Illiterate or read & write	17	11.4
Preparatory education	14	9.3
Secondary education	69	46.0
University education	50	33.3
<b>Job</b>		
Housewives	105	70.0
Working	45	30.0
<b>Residence</b>		
Urban	73	48.7
Rural	77	51.3
<b>Prenatal medical history</b>		
Yes	102	68.0
No	48	32.0
<b>If yes, the problems were:</b>		
Anemia	23	15.3
Covid-19	17	11.3
Hypertension	23	15.3
Preeclampsia	19	12.7
Premature birth	20	13.3



**Table (2): Percentage distribution of infants under the study according to demographic data and type of feeding.**

<b>Demographic data of infant and type of feeding.</b>	<b>The studied infants (n=150)</b>	
<b>a-Demographic data</b>	<b>N</b>	<b>%</b>
<b>Current age (months)</b>		
1-<4	49	32.7
4-<8	57	38.0
8-12	44	29.3
<b>Sex</b>		
Male	75	50.0
Female	75	50.0
<b>Birth order in the family</b>		
First	48	32.0
Second	38	25.3
Third	37	24.7
Fourth	13	8.7
Fifth	7	4.7
Sixth	7	4.7
<b>b-Type of nutrition</b>		
Breast milk	77	51.3
Using bottle	61	40.7
breast & bottle feeding	12	8.0

**Table (3): Percentage distribution of mothers' knowledge about failure to thrive and feeding pattern .**

Mothers' knowledge About failure to thrive	Response of the studied mothers about knowledge questions (n=150)						Total  Mean±SD
	Incorrect or don't know		Correct and incomplete		Correct and complete		
	No	%	No	%	No	%	
<b>Failure to thrive</b>							
-Definition	34	2.7	108	72.0	8	5.3	0.83±0.52
Factors	37	24.7	95	63.3	18	12.0	0.87±0.59
Types	87	58.0	48	32.0	15	10.0	0.52±0.67
Causes	51	34.0	85	56.7	14	9.3	0.75±0.61
Complications	36	24.0	92	61.3	22	14.7	0.91±0.62
Treatment	20	13.3	122	81.3	8	5.3	0.92±0.43
<b>Breast feeding</b>							
Definition	0	0	105	70.0	45	30.0	1.30±0.46
Importance of breastfeeding to a child	0	0	105	70.0	45	30.0	1.30±0.46
Advantages of breastfeeding	2	1.3	91	60.7	57	38.0	1.37±0.51
Indication the adequacy of breastfeeding.	1	0.7	103	68.7	46	30.7	1.30±0.47
Techniques of breast feeding.	45	30.0	84	56.0	21	14.0	0.84±0.64
<b>Artificial feeding</b>							
Definition	1	0.7	125	83.3	24	16.0	1.15±0.38
Reasons for artificial feeding	0	0	79	52.7	71	47.3	1.47±0.50
Calculation of feeding.	44	29.3	22	14.7	84	56.0	1.27±0.89
Definition of complementary feeding.	38	25.3	90	60.0	22	14.7	0.89±0.62
Components of the complementary foods.	30	20.0	83	55.3	37	24.7	1.05±0.67
<b>Weaning</b>							
Definition.	38	25.3	92	61.3	20	13.3	0.88±0.61
Principles of weaning.	35	23.3	92	61.3	23	15.3	0.92±0.62
Correct time of starting weaning.	38	25.3	97	64.7	15	10.0	0.85±0.58

**Table (4): Total scores of mother's level of knowledge about failure to thrive and feeding patterns.**

Mothers' knowledge scores About: -	Level of knowledge of the studied mothers (n=150)					
	Low level		Moderate level		High level	
	No	%	No	%	No	%
<b>Failure to thrive</b>	80	53.3	60	40.0	10	6.7
<b>Feeding pattern</b>						
-Breast milk	26	17.3	84	56.0	40	26.7
-Using bottle	36	24.0	88	58.7	26	17.3
-Weaning	60	40.0	73	48.7	17	11.3
<b>Total mothers' knowledge level scores</b>	<b>63</b>	<b>42.0</b>	<b>76</b>	<b>50.7</b>	<b>11</b>	<b>7.3</b>

**Table (5): Total practice scores of mothers according feeding to their infants with failure to thrive.**

Total mothers' practices scores related to:-	Level of Feeding practices' scores of the studied mothers (n=150)			
	Unsatisfactory		Satisfactory	
	No	%	No	%
- Breast milk	75	50.0	75	50.0
-Using bottle	79	52.7	71	47.3
-Weaning	116	77.3	34	22.7
<b>Total practice scores of mothers</b>	<b>125</b>	<b>83.3</b>	<b>25</b>	<b>16.7</b>

**Table (6): Relation between total mothers' knowledge and practice about feeding patterns.**

Total scores of mothers' practice :-	Level of knowledge scores of the studied mothers (n=150)						$\chi^2$ tests P value
	Low level (n=63)		Moderate level (n=76)		High level (n=11)		
	n	%	n	%	n	%	
<b>- Breast feeding practices</b>							
Unsatisfactory	31	49.2	40	52.6	4	36.4	1.045
Satisfactory	32	50.8	36	47.4	7	63.6	0.593
<b>- Bottle feeding practices</b>							
Unsatisfactory	39	61.9	35	46.1	5	45.5	3.720
Satisfactory	24	38.1	41	53.9	6	54.5	0.156
<b>- Weaning practices</b>							
Unsatisfactory	53	84.1	56	73.7	7	63.6	3.413
Satisfactory	10	15.9	20	26.3	4	36.4	0.181
<b>Total practice scores</b>							
Unsatisfactory	53	84.1	65	85.5	7	63.6	3.364
Satisfactory	10	15.9	11	14.5	4	36.4	0.186

**Table (7): Correlation between total scores of mothers, knowledge, and practice about failure to thrive and feeding pattern**

Practice scores of	Total knowledge scores of the studied mothers (n=150)	
	R	P
<b>- Breast feeding.</b>	0.050	0.540
<b>- Bottle feeding.</b>	0.126	0.125
<b>- Weaning.</b>	0.172	0.035*
<b>Total practice scores</b>	0.232	0.004*

r=Correlation Coefficient

\*Significant (P&lt;0.05)

## Discussion

Failure to thrive (FTT) is an abnormal growth pattern determined by inadequate nutrition, a disequilibrium between requirements and intakes of energy. Inadequate caloric intake is the most common cause, but inadequate nutrient absorption or increased metabolism is also possible. Difficulty attaining or maintaining appropriate weight is the first indicator of FTT. Undernutrition can lead to inappropriate height, head circumference and impaired of cognitive skills or immune function in extreme cases. Building mothers' knowledge about failure to thrive is essential to increase their practice regarding care of their infants suffering from failure to thrive<sup>(16)</sup>.

Regarding sociodemographic data of studied mothers was noticed that mothers' educational level is important factor that affect positively on thier knowledge and practice. The present study showed that, nearly half of studied mothers their educational level was secondary education. From the researcher point of view, mothers who had secondary education not have enough knowledge about failure to thrive to improve their practice regarding care of their infants with failure to thrive. This finding was in agreement with **Habibzade and Didarloo (2016)**<sup>(17)</sup> who observed the importance of educating mothers. Also **Hasan and Fatema (2020)**<sup>(18)</sup> who observed that , the maximum of studied mothers were at secondary level.

Regarding the job and residence of studied mothers ,this study showed that , failure to thrive in infants is common in rural areas than urban areas and more than two third of studied mothers not

working, this could be attributed to prevalence of FTT depends on risks within populations as low income settings, infectious diseases, poverty and inadequate nutrition<sup>(19)</sup>.**El-Asheer and Shafek (2022)**<sup>(20)</sup> agreed with the current study .

In the current study it was found that the majority of studied mothers had problems during pregnancy . Nearly one quarter of studied mothers had anemia during thier pregnancy. The result was supported by **Saber, Ahmed and Yahya (2019)**<sup>(21)</sup> who found in thier study that anemia is the commonest medical disorder during pregnancy and severe anemia is associated with poor maternal and perinatal outcomes.

Hypertensive disorders during pregnancy including preexisting and gestational hypertension, preeclampsia, and eclampsia, represent a significant cause of maternal and perinatal morbidity and mortality. sever hypertension was associated with higher rates of maternal death, small-for-gestational age (SGA), preterm delivery, a variety of other poor obstetric outcomes and failure to thrive<sup>(22)</sup>. The current study found that 14.7% of studied mothers had hypertension during thier pregnancy. **Alant and Szychowski (2022)**<sup>(23)</sup> were in the same line with this study, they found that pregnant women with chronic hypertension had complication as preeclampsia, preterm birth at less than 35 weeks' gestation, placental abruption and fetal or neonatal death.

First six months of life are recognised as a crucial developmental period, infants aged under six months of age are small and nutritionally at-risk .The

most common cause of growth failure is inadequate intake that can be due to insufficient supply or consumption of food<sup>(24)</sup>. The current study showed that, two third of studied infant aged 1- 8 months .From researcher point of view ,this may be attributed to inadequate intake in this period sometime reflects improper mixing of formula, difficulties with breastfeeding or ineffective breast feeding technique and not following principles and time of weaning. **Carlos, Eternod and Beaumont (2021)** <sup>(25)</sup> agreed with the current study and found that majority of his studied infants were under six months.

Regarding the sex of the studied infant, It was noticed that half of studied infants was male and other half was female. The result of the current study was supported by **Ashley and Badireddy (2022)** <sup>(26)</sup> who found that, There is no gender or race predisposition . the result of current study was contradicted with **Didario and Habibzadeh (2016)** <sup>(17)</sup>. who stated that, the prevalence of growth failure in female infants was more than that in the males. In addition **El-Asheer and Shafek (2022)** <sup>(20)</sup> results was contrast with the result of current study ,they noticed that males was more than females in their study.

Regarding birth order, the present study revealed that, failure to thrive was more common in the first one and second child. This could be attributed to owing to the less experience of mothers in feeding their infants. **Habibzadeh (2015)** <sup>(27)</sup> agreed with this study and stated that, the first and second-order infants were more likely to have growth failure compared with the third-order infant. On the contrary, **El-Asheer and**

**Shafek (2022)** <sup>(20)</sup> found that ,large families who have more children usually have less time to take care of their infants, and high economic burden for food consumption of these families cause them suffer from additional child, and so lead to inadequate nutritional status.

Ineffective breastfeeding technique is one of the factors contributing to mothers practicing non-exclusive breastfeeding. Inappropriate breastfeeding technique is the leading cause of nipple pain<sup>(28)</sup>. The present study revealed that ,half of studied infants were on breast feeding .From the researcher point of view, this may be attributed to if there are difficulties experienced by mothers in the first months after delivery and not having asufficient amount of milk can lead to failure to thrive. The results of current study were supported by **Lorella and Enrica (2019)** <sup>(29)</sup> who noticed in their study that, about two third of infants was on breast feeding and suffer from breast feeding difficulties.

Concerning knowledge of mothers about failure to thrive and feeding pattern, it was found that, nearly all the studied mothers gave incorrect or incomplete answer about the items of these knowledge parts. This may be attributed to education about nutrition can improve maternal nutritional knowledge and practices significantly, that improve the growth of infant. This finding was in accordance with **Appiah and Abdul-Mumin (2020)** <sup>(30)</sup> who found that Mothers had knowledge and attitude gaps. On other hand, the result of current study was contradicated with **Mohamed, Kamel and Sayed (2021)** <sup>(31)</sup> who reported that, more than

one-third of mothers have good knowledge .

Regarding total scores of mothers, knowledge, it was observed that ,nearly half of studied mothers had low level of knowledge and half of them had moderate level of knowledge. From the researcher point of view, this may be attributed to inadequate education by health care providers to mothers about nutrition in child welfare clinic and lack of recent knowledge of mothers. This finding was supported by **Saaka (2014)**<sup>(32)</sup> who reported that two-third of studied mothers were classified as having low knowledge.

Concerning mothers' level of practice, the present study found that, most of mothers had unsatisfactory practice related to feeding pattern. This could be attributed to lack of health counseling and inadequate search information from mass media regarding adequate processing and serving of adequate nutritious food for their infant. This finding is in the same line with **Mulugeta, Ejigu and Berhanu (2017)**<sup>(33)</sup> who found in their study that, infant feeding practice was poor.

The current study showed that ,mothers who had low and moderate level of knowledge had unsatisfactory practice. This may be attributed to the shortage of mothers' knowledge lead to unsatisfactory practice and nutrition education during the monthly welfare clinics is important to enhancing and updating mothers, knowledge and practice. The result of the present study was supported by **Masthalina and Agustina (2017)**<sup>(34)</sup> who found significant association between

mothers, feeding knowledge and their practice.

**Mohmed and Kamel (2021)**<sup>(31)</sup> were in the same line with current study who found in their study a significant positive relationship between knowledge, attitude and practices of mothers. On the other hand **Hasibuan and Batubara (2019)**<sup>(35)</sup> was contradicted with current study and noticed there were no significant associations between practice and knowledge of the mothers and adequate nutritional status of their infants . Regarding the correlation between total mothers, knowledge and practice scores about failure to thrive and feeding pattern, the finding of the present study showed that, there were statistically significant difference. It can be attributed to the fact that, Knowledge, attitudes and practices associated with infant and young child feeding pattern an essential first step for any 'need-felt' for an intervention program designed to bring about positive behavioral change in infant health . Nutrition is a significant factor in the growth, development, and overall functioning of a child. Good nutrition provides the energy and nutrients essential to sustain life and promote physical, social, emotional, and cognitive development<sup>(36)</sup>. The finding of the present study was in the same line with **Mohamed and Kamel (2021)**<sup>(32)</sup> who mentioned in their study, there was a significant positive relationship between knowledge, attitude, and practices.

### Conclusion

Based on the findings of the present study, it can be concluded that, most of mothers who had low and moderate

level of knowledge had unsatisfactory practices. No statistically difference between mothers, knowledge, and practice. While there was statistic significant relation between mothers, knowledge and thier demographic data.

#### **Recommendations:**

**Based on the finding of the current study, it can be recommended that:**

- In-service educational program about failure to thrive and feeding patterns should be conducted to nurses and mothers at pediatric outpatient endocrine clinic to improve thier their knowledge and practices.
- Manual logbook about care of infants with failure to thrive should be available in endocrine clinic to mothers and nurses as areference
- Further study should be conducted about failure to thrive and nutritional patterns.

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