The effect of Mothers' Nutritional education based on health belief model to prevent stunting among young children

Reda Elfeshawy [(1)], Fatma Ahmed El Sobky[(2)], Samah Abdallah Mohamed Amer [(3)], Shikhah Hussin Ali Alzahrani. [(4)]

(1) Lecturer of Pediatric Nursing, Faculty of Nursing, Menoufia University
(2) Assistant professor of Pediatric Nursing, Faculty of Nursing, Benha University
(3) Assisstant professor of pediatric nursing , Faculty of Nursing, Benha University
(4) Alriyada College for health Science, Jeddah, KSA

Abstract

Background: Stunting occurs when a child's growth and development are stunted as a result of poor nutrition, recurrent illnesses, and a lack of psychosocial stimulation. **Aim of the study** was to evaluate the effect of Mothers' Nutritional education based on health belief model to prevent stunting among young children. **Research Design:** A quasi- experimental research design was used. **Setting:** This study was conducted in the outpatient Clinic of Benha University Hospital, Benha Teaching Hospital and Benha Specialized Pediatric Hospital, which Affiliated to the Ministry of Health. **Subjects:** The study subject was consisted of convenience sample of (80) mothers and their children the samples were collected from previous setting. **Tools of data collection: Three tools:** Three tools were utilized, personal characteristics, mothers' knowledge and practice regarding feeding, and health belief model. **Results:** the results of the present study revealed that there were highly significant differences in mothers' knowledge and reported practice and their health belief model. **Conclusion:** Nutritional education based on a health belief model can help to reduce stunting in young children. **Recommendation:** To avoid stunting in children, mothers should be encouraged to participate in ongoing nutritional education programs.

Keywords: nutritional education, health belief model, stunting

Introduction:

According to the World Health Organization, stunting, referred to as linear growth retardation, is a long-term effect of starvation, and malnutrition is one of the most serious public health risks (WHO) **(WHO, 2018a).** The World Health Organization (WHO) claims that (WHO). Stunted growth is defined as a failure to reach linear growth potential due to poor health and/or nutrition. On a communal level, stunting is commonly linked to poor socioeconomic situations, frequent and early exposure to illness, and/or inappropriate feeding patterns. In 2016, 22.9 percent of children less than five years old are stunted, characterized by a poor height-to-age ratio. A z-score of more than two standard deviations below the WHO Child Growth Standards median is considered stunting. (**WHO, 2018).**

Stunting can cause disease and death in children, as well as a measure of developmental disparity. Physically and cognitively disabled children do not realize their full potential. Stunting in children is one of the World Health Assembly's nutrition target indicators. Additionally, child growth is the most widely utilized indication of a community's nutritional condition, and it is widely acknowledged as a crucial public-health indicator for population health monitoring. Poor diets and/or frequent diseases are more likely to make children with developmental disabilities sick and die. **(WHO, 2022).**

Stunted growth and development can be caused by a variety of reasons, including poor maternal nutrition and health, improper newborn and child eating practices, and illness. These involve mother health and nutrition prior to, during, and after pregnancy, which has an influence on early growth and development of the child, as well as womb establishment. **(Ozaltin, et al, 2010), &(Karawang, 2021).** However, having a balanced diet in later life, namely childhood, can overcome this. Brain development abnormalities, IQ impairment, physical growth disturbances, and metabolic disorders are all effects of stunting. **(Karawang, 2021).**

Stunting can be easily avoided by following a healthy diet. To ensure that the right nutrients are passed on to the fetus, moms should consume a well-balanced diet before getting pregnant. Exclusive breastfeeding for the first six months of life is also recommended. Aside from good hygiene practices like hands washing with soap and water before food preparation or eating. **(Tonto Foundation, 2020).** Breastfeeding promotion, supplemental feeding, and infection control strategies are all required to achieve the primary goal of stunting reduction by 2025.The health and nutrition of adolescent girls must be promoted. Prenatal nutrition, as well as other treatments for pre-pregnancy or early pregnancy, is essential in food-insecure conditions. **(Blogger, 2019).**

Stunting prevention must begin early in life and may necessitate intervention before to conception, i.e. during adolescence. Assuring adequate nutrition for pregnant and lactating mothers by suitable interventions in at-risk populations. Make sure that babies are exclusively breastfed for the first six months of their life. And that children aged 6–23 months receive adequate supplemental food in addition to breastfeeding. **(Bolem, 2013).**

It is advised that an infant be breastfed exclusively during the first six months of life. Children who are not exclusively breastfed until they are six months old and who do not continue to breastfeed until they are two years old are at a higher risk of developing health problems. At one year of age, breastfeeding provides nearly half of an infant's energy requirements, and one-third of an infant's energy requirements at two years of age. The remaining energy requirements must be supplied by consuming energy-dense supplementary foods. Failure to meet these requirements causes growth and development to be disrupted. **(Thomas, 2018).**

The Health Belief Model is a tool for maintaining good health and avoiding illness. Explain how your health habits have changed over time. The Health Belief Model is one of the most extensively used frameworks for evaluating health-related behavior. The key features of the Health Belief Model include individual health issues beliefs, which expect individual actions related to health. According to the model, the perceived threat of illness or disease (perceived susceptibility), belief of consequence (perceived severity), potential positive benefits of action (perceived benefits), perceived barriers to action (perceived barriers), exposure to factors that prompt action (cues to action), and confidence in one's ability to succeed are the main factors that influence health behaviors (self-efficacy) **(Rural Health Information Hub, 2022).**

Stunting prevention begins with mothers. During the critical 1000-day period, When a developing infant's mother is the primary source of nutrition, the youngster is completely dependent on her. They do this by eating their own food and feeding the child food, mothers have a critical influence in determining their children's food intake. **(Kueppers, 2018).**

Furthermore, because the mother is in charge of meal preparation, it is obvious that her involvement is crucial in ensuring enough nutrition for children in order to avoid stunting. Because of the long-term health consequences of child malnutrition, it is vital to intervene before a critical developmental stage is reached, and a strong mother participation in stunting prevention is critical. **(Sumiaty, et al, 2017).**

Significance of the Study:

Stunting is a major global health problem, with many countries failing to fulfill Sustainable Development Goal 2's target 2.2 (a 40% decrease in stunted children under the age of five by 2025). 1Child stuttering is a severe health issue in Egypt. One out of every five children under the age of five in Egypt was stunted in 2014, meaning they were underdeveloped for their age. The region of the Middle East and North Africa (MENA) has the highest percentage of stunted children. Egypt's stunting rate is higher than that of other low- to middle-income countries, but it is comparable to that of other low-income countries. Between 2005 and 2016, Egypt's average stunting rate was approximately three times that of Jordan, despite having similar Gross National Incomes: Egypt had 22.3 percent while Jordan had 7.8 percent. **(United Nations Children's Fund et al, 2016).**

Furthermore, even children who survive stunting have cognitive and psychological

problems. A drop in GDP of 2-3 percent determines Egypt's total health, economic, and social impacts of childhood stunting **(Onis and Branca, 2016; USAID, 2017).**As a result, improving nutrition by encouraging mothers to receive nutritional education, as well as improving access to healthcare and sanitation, are viable options for reducing childhood stunting in Egypt.

Aim of the Study:

The aim of the study was to evaluate the effect of Mothers' Nutritional education based on health belief model to prevent stunting among young children.

Research Hypotheses:

The following hypotheses were put to the test by the study's findings:

Mothers who received nutritional improvement guidelines for preventing stunting in their children based on health belief model will have higher mean score of knowledge for preventing stunting in their children.

Subjects and Method:

Research Design: A quasi- experimental research design was used to carry out the present study.

Setting: The study was carried out in the outpatient clinics of the Ministry of Health-affiliated Benha University Hospital, Benha Teaching Hospital, and Benha Specialized Pediatric Hospital. **Sample:**

The data was acquired from (80) mothers and their children using a None probability convenience sample. The samples were collected from a previous setting.

Tools of Data Collection:

Tool I: Structured questionnaires. The questionnaires designed by the researcher after studying relevant literature, were divided into five sections: Part 1: Characteristics of the studied children as gender and age

Part 2: Characteristics of the studied mothers as age, education, residence, and occupation.

Part 3: Mothers' knowledge related to stunting it includes 7 questions (definition of stunting, causes, signs and symptoms, diagnosis, complication, treatment, and prevention).

Tool II: Mothers' knowledge and practice regarding feeding: it consists of three parts:

Part 1: Mothers' knowledge regarding exclusive breast feeding: it contains 13 items about **importance** of exclusive breast milk, period for giving exclusive breast milk, and others benefits about exclusive breast milk.

Part 2: Mothers knowledge about complementary feeding: it contains 9 questions about complementary feeding as time for starting complementary feeding, and importance of complementary feeding.

Knowledge Scoring When the response was accurate, a score of (1) was provided, A score of (0) was given when the answer was incorrect / do not know.

Total ratings varied from 0 to 20, with 60 percent or more indicating satisfactory knowledge and less than 60 percent indicating unsatisfactory knowledge.

Part 3: mothers' practice regarding complementary feeding: it contains 12 items to prevent infection during complementary feeding.

Scoring system: Each step was given one of two score levels: done (2) and not done (3). (1).

The total score was divided into two categories: competent (70 percent and up) and incompetent (less than 70 percent).

Tool III: Health Belief Model Scoring System: There were 25 questions on the questionnaire.

Researchers utilized a 5-point Liker scale to assess behavior related SIDS (ranging from strongly agree to strongly disagree).(One point for strongly agreeing.)- 2 points for agreeing.- 3 points for natural.- There were four points awarded for disagreement.- Disagree strongly received a five-point rating).

Five questions were asked about **perceived susceptibility** (a min score of 5 and a max score of 25).

Five questions were asked on **Perceived severity** (a minimum score of 5 and a maximum score of 25).

Four questions were asked about the **Perceived benefits** (a minimum score of 4 and a maximum score of 20).

Six questions were asked to assess **Perceived barriers** (a minimum of 6 and a maximum of 30).

Five questions for **Cues to action** (a minimum of 5 and a maximum of 25).

Methods:

The study was carried out in the following manner: Phase of preparation: It entails looking through national and international related literatures using journals, magazines, the internet, and textbooks, as well as theoretical knowledge of the various parts of the study's issue to collect the tools of the study.

Content validity and Reliability:

Tools Validity:

The data collection tools were translated into Arabic, and three jurors, three in Pediatric nursing from Benha University's Faculty of Nursing, who are experts in the field, were chosen to assess the content validity of the instruments, as well as their clarity, comprehensiveness, relevance, simplicity, and accuracy. To get to the final version of the tools, all of their suggestions were taken into consideration, and some components were altered. The tools were reflected valid by experts.

Tools Reliability: The tools were tested for reliability using the test-retest method with 8 mothers and their children from the two hospitals, who were interviewed at one-week intervals and the data examined and compared. The internal consistency was estimated using the Cronbach's alpha coefficient approach in a pilot research to determine the reliability.

Administrative and Ethical Considerations: All of the necessary research ethical principles were followed. Before beginning the practical work, the dean of the faculty of nursing sent an official letter to the two hospital directors explaining the goal of the study and requesting that they undertake the study and acquire the relevant data. After being informed of their right to participate, reject, or withdraw at any moment, participants expressed their consent. Any data obtained was guaranteed to be completely private. The study maneuver may or may not have any adverse effects on the participants.

The Pilot Study: A pilot study was undertaken to evaluate the study tools' clarity and usefulness, as well as the time necessary for each tool. It was performed on 10% of the total subjects, (8) women and their children, who were excluded in the current study due to sample bias and contamination. Modifications were made as a result of the pilot study data, and the final version was created.

Field Work: The following phases were employed to achieve the current study's goal: assessment, planning, implementation, and evaluation. These phases were set aside for a three-month period, beginning in November 2021 and ending in January 2022.

Assessment phase:

The researchers welcomed each mother, outlined the goal, period, and activities of the study, and received written consent from mothers during this phase, which included interviews with children to collect baseline data. Then, using pre-test instruments, a pre-test was conducted to measure personal characteristics, knowledge and practice of mothers, and their health belief model (I, II, &III). .The data acquired during this phase was used to establish a baseline for future comparisons in order to determine the effect of nutritional education for mothers based on a health belief model on avoiding stunting in young children.. Each questionnaire took an average of roughly 30 minutes to complete (10-15 minutes).

Planning phase:

As evidenced by the mothers' level of comprehension in simple Arabic, the nutritional education of the mothers was created utilizing baseline data from pre-test evaluations and appropriate literature reviews.

Implementation phase:

Five days a week, from 11 a.m. to 2 p.m., the researchers went to the above-mentioned setting (Sunday and Wednesday at the

University hospital; Monday and Tuesday in the Specialized hospitals; and Saturday in the Teaching Hospital).Completing the tools took an average of 30-45 minutes. During this period, the mothers were able to provide interventions that encompassed all stunting and feeding knowledge and practices. An Arabic booklet with instructions to help moms better understand and practice feeding, as well as a one-month posttest, were included in the nutritional education.

There were four sessions of nutritional education delivered. At the beginning of the first session, each mother was expected to provide a brief summary of stunting (definition of stunting, causes, signs and symptoms, diagnosis, complication, treatment, and prevention). - The second session focused on child feeding beliefs, assumptions, and incorrect ideas, as well as factors that could be a barrier to child eating and infection prevention during meal preparation.

The third session encourages mothers to be mindful of their children's nutritional needs. and the potential for harm if they do not act (perceived susceptibility), as well as the depth perception of issues that may emerge as a result of risky practice (perceived severity).

The fourth and last session focused on the advantages of exclusive breast feeding, as well as complementary feeding (perceived benefits) and safety practices during this time (proper sanitation, and control infection during preparing the food as hand washing, protect food and water by covering them).Each session begins with a review of the previous session's objectives and a brief explanation of the next session's goals in simple Arabic to suit the level of knowledge of the mothers. The mothers' questions were discussed at the end of each session to clear up any misunderstandings. Modified lectures and group discussions were employed as teaching methods.Colored posters about stunting and child nutrition were among the educational materials.

Evaluation Phase: After one month of nutritional education, the mothers' knowledge, practice, and health belief model were assessed using tool 1 (part 3), tool 11 part (1,2, &3), and tool III.

Health education's impacts on mothers' knowledge, practise, and health belief model were explored and compared before and after one month.

Results:

Table 1 revealed that half 71.2% of mothers had age between 20-<30 years and 72.2% have moderate income more than half (56.2%) of infant between age 3-<6 months and 71.2% have artificial feeding

Figure (1) illustrated that 67.5% of mothers graduated from secondary school, 83.8% from rural area and house wife.

Figure (2) illustrated that 70.0% of infant were female and 68.8% of them first baby.

Table 2. Revealed that there was statistically significant difference between pre and after 1 month from health education (p=<0.001) related to mothers' total knowledge most of them (91.2% and 87.5%) respectively had unsatisfactory knowledge about stunting, exclusive feeding, and complementary feeding respectively pre health education as compared to post health education 68.2 and 88.7 respectively had satisfactory knowledge.

Table 3. showed that that there was statistically significant difference between pre and after 1 month from health education (p=<0.001) related to mothers' reported practice.

Table 4. The table illustrated that the total mother's reported practice, indicated that 78.7% have poor practice before health education implantation. While after one month from implementation 82.5% have good reported practice.

Table 5. Demonstrated that there was statistically significant difference between pre and after 1 month from health education (p=<0.001) related to health belief models items it showed that increase mean score of health belief model of the mothers after implementation of health education.

Table (1): Percentage Distribution of mothers and their children related to their Baseline Characteristics

Items	N (80)	%
Mother age: <20 20-<30 30-<40 40 and more	 3 57 16 4	 3.8 71.2 20.0 5.0
Income: Low Moderate	 25 58	 27.5 72.5
Infant age: 1-<3 month 3-<6 month 6-<9 m0nth 9- 12 month	 8 45 19 8	 10.0 56.2 23.8 10.0
Type of feeding: Breast feeding Artificial feeding	 23 57	 28.8 71.2
Birth weight: Normal Low weight	 31 49	 38.8 61.2

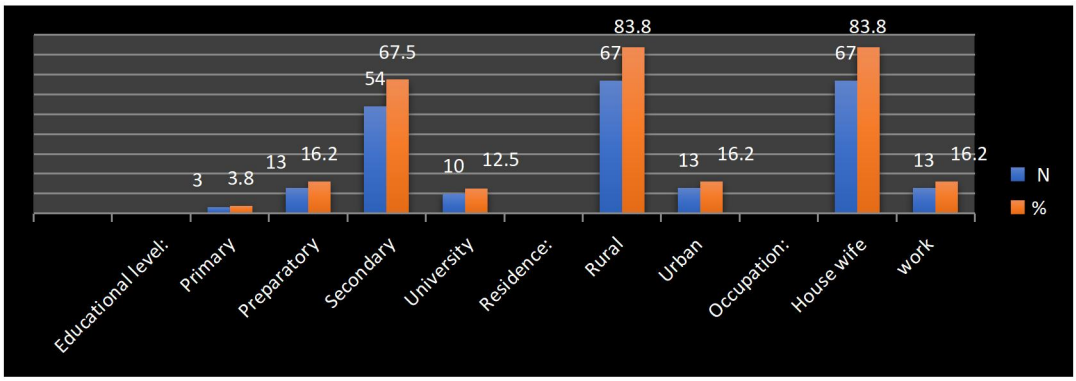

Figure (1): distribution of mothers according to personnel characteristics

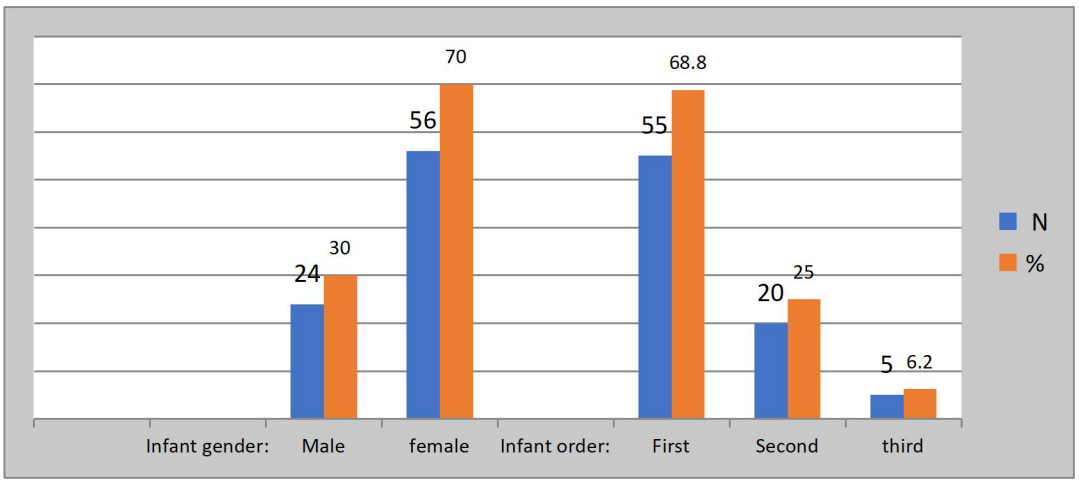

Figure (2): distribution of infant according to personnel characteristics

Table (2): Comparison between the mother's knowledge before Health Education Implementation and after 1 Month from Implementation

Items	Pre-Health education		After one month		X^2	P
	N	%	N	%		
Total Knowledge about stunting Satisfactory Unsatisfactory	7 73	8.8 91.2	69 11	86.2 13.8	95.5	<0.001
Mean ±SD	1.42 ± 1.07		5.27 ± 1.21			
Total Knowledge about exclusive breast feeding Satisfactory Unsatisfactory	7 73	8.8 91.2	69 11	86.2 13.8	181.5	<0.001
Mean ±SD	3.56 ± 2.1		10.43 ± 2.23			
Total Knowledge about complementary feeding Satisfactory Unsatisfactory	10 70	12.8 87.5	71 9	88.7 11.3	14.79	<0.005
Mean ±SD	1.21 ± 1.94		8.00 ± 2.00			

Table (3): Mother's reported practice about stunting before Health Education Implementation and after1 Month from Health Education Implementation

Items	Pre-Health Education				After one month from Health Education				X^2	P
	Done		Not done		Done		Not done			
	N	%	N	%	N	%	N	%		
Wash hands with soap before preparing food	16	20.0	64	80.0	76	95.0	4	5.0	1.05	>.005
Use fresh food that looks and smells good	22	27.5	58	72.5	71	88.8	9	11.3	3.84	<..005
Keep perishable food and cooked food in a refrigerator if the family has one	11	13.8	69	86.2	68	85.0	12	15.0	15.64	<..001
Cover cooked food and eat within 2 hours if there is no refrigerator.	20	25.0	60	75.0	73	91.3	7	8.8	4.22	<..005
Wash children's hands before meals	6	7.5	74	92.5	68	85.0	12	15.0	36.75	<..001
Feed the child with a clean spoon or cup	16	20.0	64	80.0	68	85.0	12	15.0	7.94	< .001
Keep animals outside the home	11	13.8	69	86.2	70	87.5	10	12.5	6.64	<..001
Keep the house and outside areas clean	9	11.2	71	88.2	74	92.5	6	7.5	1.8	>..005
house use toilets so that faces are not left exposed	17	21.2	63	78.8	71	88.8	9	11.2	19.34	<..001
Wash dirty nappies straightaway or put them in a tightly sealed plastic bag	16	20.0	64	80.0	67	83.8	13	16.2	11.11	<..005
Wash hands with soap after using the toilet and after cleaning the baby's bottom	23	28.8	57	71.2	65	81.2	15	15.8	5.4	<..005
Protect food and utensils from rats, mice, cockroaches, flies, and dust by keeping them covered	36	45.0	44	55.0	64	80.0	16	20.0	7.27	<.005
Protect stored drinking water from animals, dust, hands, dirty scoops, and dippers.	29	36.3	51	63.7	61	76.3	19	23.7	1.06	>..005

Table (4): Comparison between the mother's total reported practice before Health Education Implementation and after 1 Month from Implementation

Items	Pre-Health education		After one month		X^2	P
Total reported practice about stunting	N	%	N	%		
Good Average Poor	7 11 63	7.5 3.8 78.7	66 5 9	82.5 6.3 11.2	121.29	<0.001
Mean ±SD	2.90 ± 3.44		11.20 ± 2.45			

Table (5): Comparison of Mothers' Health Belief Models Mean score before Health Education Implementation and after1 Month from Implementation.

Items	Pre-Health education	After one month	t test	P value
	Mean ± SD	Mean ±SD		
Perceived Susceptibility	9.05 ± 2.82	19.21 ± 4.42	-14.16	<0.001
Perceived Severity	10.08 ± 3.36	19.40 ± 4.49	-12.09	<0.001
Perceived Barriers	13.41 ± 3.305	24.41 ± 5.08	-13.45	<0.001
Perceived Benefits	8.55 ± 2.84	16.93 ± 2.19	-16.10	<0.001
Cues to Action	10.35 ± 2.12	19.56 ± 3.45	-18.69	<0.001

Discussion:

A lack of interpersonal stimulation, poor nutrition, or persistent illness can hinder a child's growth and development.If a child's height for age falls more than two standard deviations below the WHO Child Growth Standards median, he or she is considered stunted. **(WHO, 2022).** Breastfeeding, on the one hand, is critical in avoiding stunting; on the other hand, good nutrition and stunting are inversely proportional **(Adhikari, 2020).** Breastfeeding is one of the most effective techniques to ensure the life and health of a child.

However, during the previous two decades, about two out of every three infants has not been exclusively breastfed for the necessary six months.Breast milk meets all of an infant's energy and nutritional needs during the first few months of life, and it continues to meet half or more of a child's nutritional needs in the second half of the first year, and up to a third in the second. (WHO,2022).

To avoid stunting, it was suggested that women be educated about exclusive breastfeeding during prenatal care. The existent study found that, the majority of children (83%) resided in rural settings(1).The research that was done by **(Danaei, et al, 2016).** According to the report, environmental risk is the second-largest risk factor in South Asia, Sub-Saharan Africa, and East Asia and the Pacific, while nutrition and infection problems are the second-largest risk factor in other countries. Stunting is a worldwide problem that affects 7.2 million people owing to a lack of sanitation.

In relation to mothers' knowledge before Health Education Implementation and after 1 Month from Implementation, table (2). Revealed that mothers' knowledge about exclusive breastfeeding has been found to be unsatisfactory prior to the programme, but satisfactory afterward. This conclusion contradicted the findings of a research done in Abha, Saudi Arabia, by (Ayed, 2014). & (Alamirew, et al, 2019). Demonstrated that mothers have appropriate knowledge about exclusively breastfeed their children, According to the definition of complementary feeding "When breast milk alone is no longer sufficient to support an infant's nutritional demands, extra foods and beverages, in addition to breast milk, are required" (WHO, 2020). The identical tables confirmed that the bulk of mothers had satisfactory knowledge and correspondingly the mothers' have higher mean score (5.27 ± 1.21) of knowledge after received nutritional improvement guidelines for preventing stunting in their children based on health belief model. The findings also revealed that there was a statistically significant difference between pre and after 30 days of carrying out a health education program whereas (p=<0.001). Providing information on the timing of the introduction of solid and semisolid foods, maintaining breastfeeding after the introduction of such foods, hygiene, the diversity, quantity, consistency, and frequency of complementary foods, and children feeding during or after illness are some educational interventions for improving complementary feeding.

According to mothers' reported practice table (3). Reported that there was statistically significant difference between pre and after 1 month from health education (p=<0.001) related to mothers' reported practice. Feeding practices have a significant impact on a child's rate of development and growth. This outcome corresponds to (Sira et al, 2020).Who came to

the conclusion that feeding practices are critical in preventing stunting

The mean score table for mothers' health belief models (5),The data also demonstrated that there was a statistically significant difference in health belief models items before and after 1 month of health education (p=0.001).The mean score of the moms' health belief model improved.

As regard to perceived susceptibility, the findings revealed that there is a significant difference between variable perceived susceptibility and mothers' nutritional education to prevent stunting in their children. This result matched those of a study conducted by (Nenobais, & Katmin, 2021). Indicated that there was positive and a significant effect on perceived susceptibility and mothers' nutritional education.

Regarding to perceived severity the findings of this study, there was significant difference after mothers' nutritional education was implemented. This finding contradicted the findings of a research done by **(Hupunau, et al 2019).** Shown that there is no significant association between perceived severity and mothers' nutritional education. However, after receiving health education, the perceived barriers were reduced. This outcome matched the findings of a research done by **(Diddana,et al 2018).**

According to the researcher, nutritional education for mothers is critical for improving their children's health and preventing stunting. Furthermore, awareness of the perceived risk and severity of poor nutrition, as well as the perceived advantages of practicing good nutrition, may increase mothers' nutritional knowledge and behavior.

Conclusion:

Based on This study's findings, it can be concluded that, nutritional education based on a health belief model can help to reduce stunting in young children.

Recommendation:

The following recommendations can be made in light of the current study's findings:

- Mothers' health education programme aiming at improving nutritional education and preventing stunting in their children.
- Stunting and health-related practices are discussed in detail in these Booklets. All mothers should have access to it, It should be available in all health-care facilities and distributed widely..
- More research into the links between diet and normal child growth is required

References:

Adhikari, S. (2020): Interrelationship Between 'Nutrition and Stunting. November 23, 2020

Alamirew,M. W.,, Bayu, N. H., , Tebeje, N. B., and Kassa, S. F. (2017): Knowledge and Attitude towards Exclusive Breast Feeding among Mothers Attending Antenatal and Immunization Clinic at Dabat Health Center, Northwest Ethiopia: A Cross-Sectional Institution Based Study. Journal of Nursing Research and Practice. Volume 2017 |Article ID 6561028 | https://doi.org/10.1155/2017/6561028

Ayed, A.(2014): "Knowledge, attitude and practice regarding exclusive breastfeeding among mothers attending primary health care centers in Abha city," International Journal of Medical Science and Public Health, vol. 3, no. 11, p. 1355, 2014.

Bloem, M. (2013): Preventing Stunting: Why it Matters, What it Takes. Chapter1. June 2013. Please see the SUN website for more recent updates

Blogger, P, G. 2019: Stunting: concept, causes, consequences, and cure: PLOS Medicine 15th Anniversary General Global Health Maternal Newborn and Child Health. October 30, 2019

Danaei, G., Andrews, K. G., Sudfeld, C.R., Fink, G, McCoy DC, Peet E, et al. Risk Factors for Childhood Stunting in 137Developing Countries: A Comparative Risk Assessment Analysis at Global, Regional, and Country Levels. PLoS Med. 2016;13(11):1–18.

Diddana, T. Z., Kelkay, G. N., Dola, A. N., and Sadore, A. A. (2018): Effect of Nutrition Education Based on Health Belief Model on Nutritional Knowledge and Dietary Practice of Pregnant Women in Dessie Town, Northeast Ethiopia: A Cluster Randomized Control Trial. J Nutr Metab. 2018; 2018: 6731815. Published online 2018 Jun 21. doi: 10. 1155/ 2018/6731815

Global Panel: United Nations Children's Fund, World Health Organization and World Bank (2016) 'UNICEF-WHO-World Bank Joint Child Malnutrition Estimates'.

Hupunau,R., E., Pradanie, R., Kusumaningru, T. (2019) : the health belief model theory approach to mothers behavior in fulfilling nutrition needs for toddler

Karawang, H. (2021): 5 Effective Ways To Prevent Stunting in Children. Posted On: 03 March 2021. Reviewed By: dr. Sally Palit, SpA

Kueppers, J. (2018): HHS Public Access HHS Public Acces., 125 (2018), pp. 527-536

Nenobais, D. I., & Katmin. (2021): Application of Health Belief Model Theory on Prevention of Stunting in Toddlers Through Nutritional Behavior. Journal for Quality in Public Health ISSN: 2614-4913 (Print), 2614-4921 (Online) Vol. 5, No. 1, November 2021, pp: 27-34 DOI: 10. 30994/jqph.v5i1.244

October 30, 2019 PLOS Guest 15th Anniversary General Global Health Maternal Newborn and Child Health Open Access Policy

Onis, Mercedes, and Francesco Branca (2016) 'Childhood stunting: a global perspective,' Maternal and Child Nutrition.

Ozaltin E, Hill K, Subramanian SV. Association of maternal stature with offspring mortality, underweight, and stunting in low- to middle-income countries. JAMA. 2010;303(15):1507–16. doi:10.1001/jama.2010.45

Rural Health Information Hub. (2022): The health belief model.

Sira, S., Asbar, R., Salim, N., Tamrin, A. (2020): Breastfeeding practices can potential to prevent stunting for poor family. First International Conference on Nutrition and Public Health. Vol. 30. Issue S4. (ICNPH-2019) pages 13-17 (June 2020)

Sumiaty, S., Pont, A. V., Sundari, S. (2017): Relationship of Mother Factors Breastfeeding and Stunting Pattern in Central Sulawesi. Int J Sci Basic Appl Res., 35 (2017), pp. 413-420

Thomas,L. (2018): Risk Factors for Stunted Growth. Last Updated: Nov 20, 2018. News medical life science.

Tonto Foundation. 2020: What Is Stunting and Why It Matters Monday, 29 June 2020

United Nations Sustainable Development Knowledge Platform. Sustainable Development Goals (https:// sustainabledevelopment. un. org/sdgs, accessed 22 January 2018).

WHO (2018a) 'Egypt – Nutrition

WHO, 2022: Breast feeding.

WHO. (2022): Stunting among children under 5 years of age (JME). WHO Global Database on Child Growth and Malnutrition || http:// www. who. int/ nutgrowthdb/ en/

WHO. (2022): Stunting in a nutshell

World Health Organization. The WHO Child Growth Standards (http://www.who.int/ child growth/en/, accessed 22 January 2018).