Educational Program for Pregnant Women About Nutritional Stunting Among Children Under Two Years Old

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Abstract

Poor maternal nutrition during pregnancy and breastfeeding can lead to stunted growth of their children. **Aim:** To evaluate the effect of an educational program for pregnant women about nutritional stunting among two years children at Sohag Governorate. **Research design:** Quasi- experimental research design. **Setting:** MCH centers at Sohag Governorate. **Sample:** 350 pregnant mothers. **Tools: Tool (1):** Included four parts**: Part (1):** Socio-demographic characteristics. **Part (2):** Obstetrical history of pregnant women, **Part (3):** Medical history of pregnant women. **Part (4):** Pregnant women's knowledge about nutrition during pregnancy, lactation and knowledge about nutritional stunting. **Tool (2):** Included child reported feeding practices. **Results:** 35.4 % of studied pregnant women were aged ≥ 30 years, 57.4% had secondary education, 86.0% were housewives and 48.0% of them at the low social class. Half of them had poor knowledge at pre-test with improvement in post-test. Also, high statistically significant differences of mothers' feeding practices in pre, post and follow-up. **Conclusion:** Health education program had a significant influence on increasing the knowledge and reported feeding practices of mothers related to their children. **Recommendations:** Further educational program about nutritional stunting for mothers in different settings to include larger sample size.

Keywords: Stunting, Pregnant Women, Knowledge, Feeding practice & Child feeding.

Introduction

Malnutrition in children can obvious in different ways; malnourished children can be underweight or obese, or their height can be stunted. Global health experts used to measure progress toward meeting childhood malnutrition goals on the basis of improvements in weight. Stunting now is the top priority because children who drop weight from a few days of being sick or hungry can readily gain it back, while the stunting that results from chronic malnourishment during early development has lasting consequences **(Hoddinott, 2019 & World Health Organization (WHO), 2019)**.

Stunting is well-defined as the percentage of children aged 0 to 59 months whose height for age is below minus two standard deviations (moderate and sever stunting) and minus three standard deviations or more (sever stunting) from the median of the WHO (child growth standards).Significant rate of stunting amongst Egyptian children; 29 % of children under 5 years of age were stunting and 14 % were severely stunted the largest number of stunted children in the Middle East and North Africa (MENA) region. National incidence of Stunting is: Menya 26.2 %, Asyut 32.6% and Sohag 25.8% **(United Nations**

Children's Fund (UNICEF), 2019[a] and Egypt Demographic and Health Survey (EDHS), 2019 and UNICEF, 2019[b]).

Most stunting occurs in the first 1000 days, when children's linear growth is most sensitive to nutrition deprivation and environmental stress. During the first 500 days, from conception to about 6 months of age, the child is completely dependent for its nutrition on the mother, either via the placenta during pregnancy or via breast milk during the initial 6-month exclusive breastfeeding period. However, the largest proportion of stunting occurs during the complementary feeding period (6–23months) and the effect is very permanent. These include delayed motor development, impaired cognitive function and poor school performance **(Nkurunziza et al, 2019 & UNICEF, 2019[c], Handayani & Makful, 2019 & Balalian et al, 2019)**.

Most growth retardation happens very early in life. Studies showed that there is a critical window of opportunity between preconception and age two, during which nutrition can have a measurable and lasting impact on growth. Screening is done by routine and periodic check-ups for child as measuring height and weight. Once recognized, stunting and its

effects typically become lasting. Regular visits to health facility and encourage mothers to follow up to provide with specialized nutrition products for pregnant women and children and get systematic education during their visits **(Simanjuntak et al, 2019 & UNICEF/WHO/World Bank, 2020)**.

Prevention of stunting is the central role of community health nurse which could be accomplished by provides health education about definition of nutritional stunting, signs and symptoms and how to promote and protect child from stunting. Encouraging of breastfeeding for new-borns within one hour of delivery and exclusive breastfeeding for the first 6 months with good complementary diet for children aged 6 to 24 months is a key element to prevent children nutritional stunting **(WHO, 2018, WHO, 2019 and Januarti & Hidayathilla, 2020)**.

Significance of the study:

In Egypt stunting is a foremost threat to the public health, affecting 2.1 million Egyptian children in 2019.One in every five Egyptian children under the age of five was stunted. A detected decline of 2-3% of Gross Domestic Product (GDP) in Egypt reveals the combined economic, health and social costs associated with childhood stunting **(EDHS, 2019, UNICEF, 2019$_a$ & United States Agency for International Development (USAID), 2019)**.

Aim of the study:

The study aimed to design, implement and evaluate an educational program for pregnant women about nutritional stunting among two years children at Sohag Governorate.

Research hypothesis:

Null hypothesis: Pregnant women knowledge and reported feeding practices for child didn't improve after the completion of the educational program.

Hypothesis 1: Pregnant women knowledge and reported feeding practices for child will improve after the completion of the educational program.

Subjects and Method

Research design: Quasi- experimental research design.

Setting: This research performed in the Maternal and Child Health Centres (MCH), which serving large number of population from Sohag Governorate and providing all health services to mothers and their children. Total number of MCH Centres are11 (3 at North, 3 at East, 3 at South, 1 at West, and one Centres at Sohag city). The study conducted in (40%) of the total number of (MCH) that represented 5 Centres (one centres from each side); at north Tahta, at south El Monshaa, at east Sakaltta, at west Gehynaa and Sohag city which were selected randomly through closed envelope method; 11 pieces

of paper representing Sohag MCH centres which placed in 5 envelopes; one piece in each envelope, which placed in a box, then one envelope was chosen without any bias.

Sampling and sample size calculation: Systematic random sampling with probability proportionate to size used to select the participating pregnant women. The number of pregnant women that took from each MCH centres calculated by the number of follow rate of the pregnant women in this MCH (total of follow rate during 6 months divided on 6); which divided by the total number of pregnant women follow rate at MCH centres (9708) pregnant women and then multiplied by the sample size. According to the following equation:

$$\frac{The\ number\ of\ pregnant\ women\ in\ each\ MCH}{Total\ number\ of\ pregnant\ women\ in\ the\ selected\ MCH} \times estimated\ sample\ size\ by\ EPI/info$$

Sample Size: Calculated using Epi info (ver.7). The used parameters to estimate the minimum required sample size included prevalence of stunting among children in Egypt 29 % according to **(EDHS and Ministry of Health and Population, 217)** margin of error 5% and 95% confidence interval. The minimum required sample was 316 pregnant women, 10% added to compensate dropout and refusals. A total number of 350 pregnant women were interviewed in this study.

	District	MCH	Flow rate2020	No. (n=350)	%
1	North	Tahta	1343	49	14%
2	South	EL Monshaa	2468	88	25.1%
3	East	Sakoltta	1861	65	18.6%
4	West	Gehynaa	861	26	7.4%
5	Sohag city	Sohag	3175	122	34.9%
Total			9708	350	100%

Inclusion criteria:

Pregnant women at second trimester of pregnancy (fourth month of pregnancy) and had at least one child under two years old that attend to MCH centres and accept to participate in the study.

Tools of the study:

Two tools designed by the researchers after reviewing literature to collect data. **Tool (1):** An interview questionnaire, **Part (I):** Included socio- demographic characteristics as, age, sex, residence, marital status, income, occupation, level of education and social level **(Abdel El-twab scale, 2012)**. **Part (II):** Involved the obstetrical history of pregnant women such as, number of previous pregnancy, pregnancy spacing, still birth, low birth weight child and low

birth height...etc. **Part (III):** Medical history of pregnant women such as hypertension, diabetes, anaemia, thyroid dysfunctions and cardiovascular diseases. **Part (IV):** Questions to assess pregnant women knowledge about nutrition during pregnancy and lactation such as proper nutrition during pregnancy (7grades), did mother's nutrition effect on child growth (1grade), vitamins and supplements that the pregnant women need (6 grades), information about sources, deficiency, absorption and requirements for the basic elements of nutrition (68 grades); total knowledge score was (82 grades).

Part (V): Questions to assess pregnant women knowledge about nutritional stunting such as definition (1 grad), causes (7 grades), signs and symptoms (9 grades), complications (6 grades), maternal factors (5 grades), early detection and diagnose (4 grades); total knowledge score was (32 grades).

Scoring system for knowledge (114 grades): Each correct answer took one grade and wrong answer or didn't know took zero grades. The total score of knowledge was categorized as follow: less than 50% was graded as poor, 50% to less than 75% was graded as fair and greater than or equal 75% of total scores was graded as good **(Ibrahim and Abd El-Maksoud, 2018)**.

Tool (II): Included child feeding practices as reported by their mothers; which consisted of breast feeding practices (22 grades), general weaning rules (12 grades), psychological child's care during feeding (5 grades), storage and safe preparation of weaning food (10 grades) and nutrition during and after periods of illness (4 grades).

Scoring system for child reported feeding practices (53 grades): Each correct answer took one grade and wrong answer or didn't know took zero grades. The total score of reported feeding practices was categorized as: < 50% of the total score considered poor, from 50% to less than 75% considered fair and from 75% and more considered good **(Ibrahim & Abd El-Maksoud, 2018)**.

Reliability: Testing reliability of the study tools was done by Cronbach′s Alpha test it was **0.78** for knowledge and for reported feeding practices for child was **0.805**.

Validity: Tools evaluated by five experts from Community Health Nursing Department and Paediatric Nursing Department, Faculty of Nursing, Assiut University, the required modifications were done.

Pilot study:
It conducted before beginning of data collection on 42 women represented (10%) which included in the study because there weren't modifications in the form.

Methods:

1. **Administrative phase:** An official letter approval obtained from the Dean of the Faculty of Nursing, Assiut University to the Undersecretary Ministry of Health at Sohag Governorate to conduct the study after full explanation about its aim. The letter involved agreement to perform the study at MCH centres at Sohag Governorate.

2. **Ethical considerations:** The Ethical Committee at the Faculty of Nursing Assiut University has accepted the plan for study. There was no risk to the participants during the applications. Pregnant women were had right to withdraw from the research at any time. Confidentiality and anonymity was assured.

3. **Data collection phase**: The researcher trained five data collectors (two of them had Master Degree in Paediatric and Community Health Nursing and three had Bachelor's Degree in Nursing Sciences) to aid in data collection in every selected MCH centres (one in each MCH). The researcher explained to them the purpose of the study and trained them how to fill in the questionnaire, took the anthropometric measurement for children and providing health education program, followed by researcher supervision and guidance.

An explanation of the purpose of the study was done to MCH centres mangers and pregnant women. Also, oral consent token from pregnant women. The study started from the first of July 2020 to the end of June 2021(12 months). Average number of participated pregnant women met per day was (10). Each group (10 mothers) attended 6 sessions; 2 sessions / day for three days/week; the duration of each session ranged from 35-45 minutes according to the arranged time of the researcher and the participated pregnant women. The researcher arranged break about 30 minutes between 2 sessions including distribution of snack and child toys for the pregnant women and their children. The sessions given according to the previous program phases and first session included pre-test and last session included post-test. Follow up test carried out for each group after three months from application of the program for each group by using the same formula used in pre and post-test.

Educational program:
The educational program developed based on the pertinent literature. Brochure and educational booklet was prepared which include the summarized simple information about definition, causes, complications, associated factors, importance of the 1000 days and prevention of nutritional stunting.

General objective: To improve maternal knowledge and reported feeding practices about nutritional stunting among children under two years old.

Specific objectives:
- Detect level of mothers' knowledge and reported feeding practices before the implementation of the program.
- Plan health educational program about nutritional stunting.
- Implement and evaluate health educational about nutritional stunting.

Contents of the program: Included two parts;

A) Theoretical part: Included definition, causes, complications, signs and symptoms, diagnosis and prevention of nutritional stunting, importance of 1000 days of life.

B) Practical part: Include breastfeeding practices, preparation of child meals and how mothers monitoring their child growth (weight, height and BMI).

Phases of the educational program:

A) Assessment phase:-The researcher and assistant data collectors met pregnant women in the MCH centers and explained the purpose of the study. Assessment of educational program based on the assessment of pregnant women at pre-test about nutritional stunting and reported feeding practices. At this stage the educational program was decided.

B) Planning phase: - An arrangement of the program conducting was done sessions and time of the program decided. Other facilities were checked as teaching place, audio-visual aids, and hand-outs…. etc.

 Teaching place: The study program conducted in the room of seminar at every MCH centre.

Teaching time: Decided according to time table and the coordination between the researcher and the pregnant women

Teaching methods and materials: included simple teaching methods such as: lecture, discussion, demonstration and re-demonstration and role play. The media as pictures, posters, dolls, video and hand-outs.

C) Implementation phase: - *Sessions:* The contents of the program divided into six sessions: **The 1st included:** Pre-test, orientation and introduction about nutritional stunting. **The 2nd included:** causes, risk factors, complications and diagnosis of nutritional stunting. **The 3rd included:** Identify importance of the most critical period 1000 days from conception to child second birthday and nutrition during pregnancy and lactation and breast feeding practices. **The 4th included:** Infant and child feeding practices and

how to prepare child meals. **The 5th included:** Behaviour and hygienic rules in stunting prevention. **The 6th and the last one:** How to take care of the child during illness and how to monitor child growth and finally fill-in the post -test questionnaire.

D) Evaluation phase:-
- The evaluation was done through post-test immediately after applying the program.
- **Follow up:** After 3 months from applying the educational program for each group.
4. **Statistical analysis:** Data entry and analysis were done using SPSS version 22 (Statistical Package for Social Science). Data presented as number, percentage. Chi-square test used to compare qualitative variables. Pearson correlation was done to measure correlation between quantitative variables. P-values considered statistically significant when P< 0.05.

Result

Table (1): Distribution of studied pregnant women according Socio-demographic characteristics at Sohag Governorate 2020

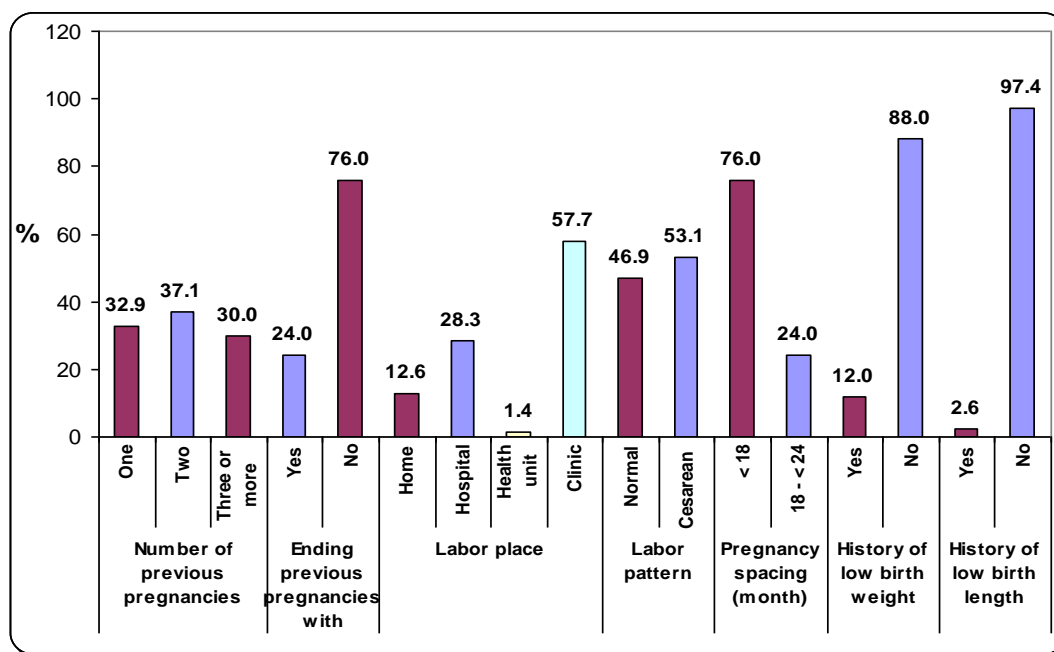| Items	No. (350)	%
Age (years):		
< 25	115	32.9%
25 - < 30	111	31.7%
≥ 30	124	35.4%
Mean ± SD (Range)	27.63 ± 5.32 (19.0-45.0)	
Mothers' education:		
Illiterate	9	2.6%
Read & write	11	3.1%
Primary	13	3.7%
Preparatory	42	12.0%
Secondary	201	57.4%
University	74	21.1%
Mothers' occupation:		
Working	49	14.0%
Not-working	301	86.0%
Residence:		
Rural	178	50.9%
Urban	172	49.1%
Social class (Abdel El-twab scale, 2012):		
Low	168	48.0%
Middle	107	30.6%
High	75	21.4%

Figure (1): Distribution of studied pregnant women according to their obstetrical history at Sohag Governorate, 2020
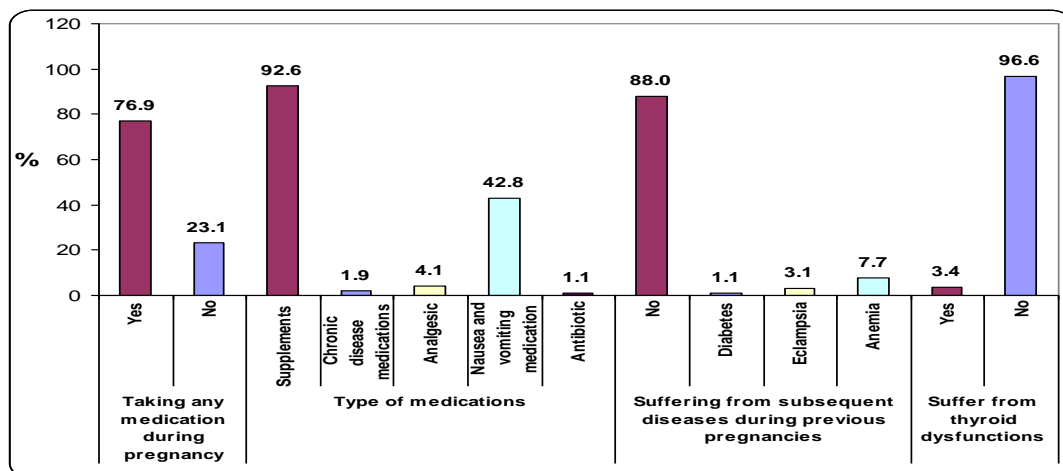
Figure (2): Distribution of studied pregnant women according to their medical history at Sohag
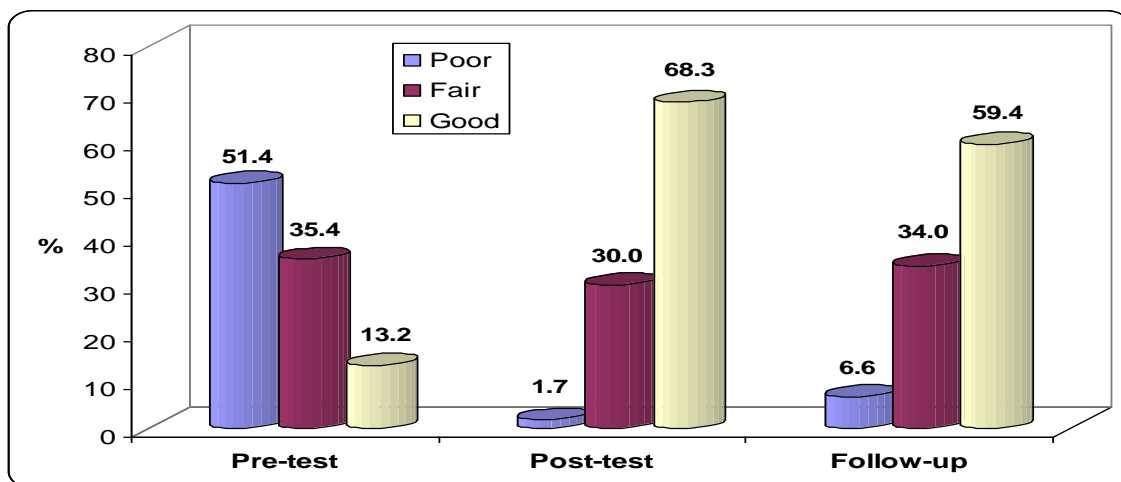

Figure (3): Total knowledge scores of studied pregnant women regarding nutritional stunting in pre, post and follow up
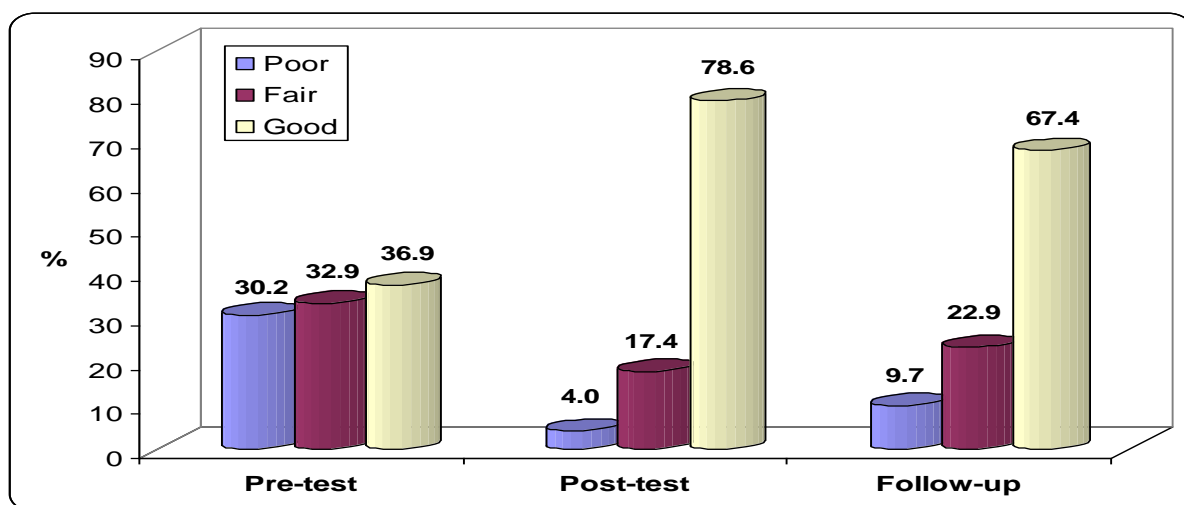

Figure (4): Total scores of reported feeding practices by studied pregnant women in pre post and follow up

Table (2): Statistical differences relation between socio-demographic characteristics and total score of knowledge regarding nutritional stunting (pre, post and follow up) for the studied pregnant women at Sohag Governorate 2020(n=350)

Personal data	Pre-test						P-value	Post-test						P-value	Follow-up						P-value
	Poor (180)		Fair (124)		Good (46)			Poor (6)		Fair (105)		Good (239)			Poor (23)		Fair (119)		Good (208)		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
Age (years):																					
< 25	66	57.4	36	31.3	13	11.3		2	1.7	38	33.0	75	65.2		9	7.8	37	32.2	69	60.0	
25 - < 30	53	47.7	45	40.5	13	11.7	0.419	1	0.9	31	27.9	79	71.2	0.802	8	7.2	37	33.3	66	59.5	0.871
≥ 30	61	49.2	43	34.7	20	16.1		3	2.4	36	29.0	85	68.5		6	4.8	45	36.3	73	58.9	
Mother education:																					
Basic education or less	50	66.7	24	32.0	1	1.3		3	4.0	35	46.7	37	49.3		10	13.3	31	41.3	34	45.3	
Secondary	104	51.7	76	37.8	21	10.4	0.000*	3	1.5	57	28.4	141	70.1	0.000*	10	5.0	69	34.3	122	60.7	0.009*
University	26	35.1	24	32.4	24	32.4		0	0.0	13	17.6	61	82.4		3	4.1	19	25.7	52	70.3	
Mother occupation:																					
Working	17	34.7	19	38.8	13	26.5	0.004*	1	2.0	9	18.4	39	79.6	0.159	3	6.1	13	26.5	33	67.3	0.460
Not working	163	54.2	105	34.9	33	11.0		5	1.7	96	31.9	200	66.4		20	6.6	106	35.2	175	58.1	
Residence:																					
Rural	91	51.1	61	34.3	26	14.6	0.693	3	1.7	54	30.3	121	68.0	0.990	13	7.3	62	34.8	103	57.9	0.772
Urban	89	51.7	63	36.6	20	11.6		3	1.7	51	29.7	118	68.6		10	5.8	57	33.1	105	61.0	
Social class:																					
Low	96	57.1	56	33.3	16	9.5		3	1.8	60	35.7	105	62.5		15	8.9	60	35.7	93	55.4	
Middle	52	48.6	40	37.4	15	14.0	0.127	2	1.9	26	24.3	79	73.8	0.267	4	3.7	36	33.6	67	62.6	0.378
High	32	42.7	28	37.3	15	20.0		1	1.3	19	25.3	55	73.3		4	5.3	23	30.7	48	64.0	

Table (3): Statistical relation between socio-demographic characteristics and total score of reported feeding practices regarding nutritional stunting (pre, post and follow up) for the studied pregnant women at Sohag Governorate 2020 (n=350)

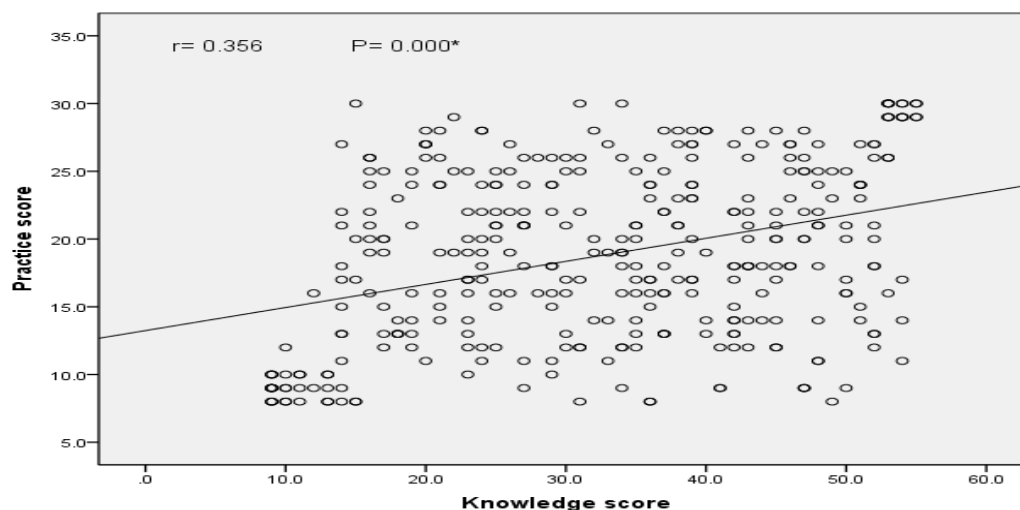| Personal data	Practice level																				
	Pre-test						P-value	Post-test						P-value	Follow-up						P-value
	Poor (106)		Fair (115)		Good (129)			Poor (14)		Fair (61)		Good (275)			Poor (34)		Fair (80)		Good (236)		
	No.	%	No.	%	No.	%		No.	%	No.	%	No.	%		No.	%	No.	%	No.	%	
Age (years):																					
< 25	35	30.4	41	35.7	39	33.9		6	5.2	20	17.4	89	77.4		11	9.6	28	24.3	76	66.1	
25 - < 30	33	29.7	31	27.9	47	42.3	0.632	5	4.5	20	18.0	86	77.5	0.841	9	8.1	30	27.0	72	64.9	0.500
≥ 30	38	30.6	43	34.7	43	34.7		3	2.4	21	16.9	100	80.6		14	11.3	22	17.7	88	71.0	
Mother education:																					
Basic education or less	40	53.3	19	25.3	16	21.3		4	5.3	15	20.0	56	74.7		11	14.7	17	22.7	47	62.7	
Secondary	49	24.4	77	38.3	75	37.3	0.000*	5	2.5	39	19.4	157	78.1	0.151	13	6.5	51	25.4	137	68.2	0.111
University	17	23.0	19	25.7	38	51.4		5	6.8	7	9.5	62	83.8		10	13.5	12	16.2	52	70.3	
Mother occupation:																					
Working	11	22.4	20	40.8	18	36.7	0.324	1	2.0	10	20.4	38	77.6	0.656	6	12.2	14	28.6	29	59.2	0.414
Not working	95	31.6	95	31.6	111	36.9		13	4.3	51	16.9	237	78.7		28	9.3	66	21.9	207	68.8	
Residence:																					
Rural	53	29.8	61	34.3	64	36.0	0.847	5	2.8	35	19.7	138	77.5	0.305	18	10.1	45	25.3	115	64.6	0.492
Urban	53	30.8	54	31.4	65	37.8		9	5.2	26	15.1	137	79.7		16	9.3	35	20.3	121	70.3	
Social class:																					
Low	61	36.3	52	31.0	55	32.7		8	4.8	33	19.6	127	75.6		19	11.3	41	24.4	108	64.3	
Middle	27	25.2	39	36.4	41	38.3	0.172	4	3.7	14	13.1	89	83.2	0.597	7	6.5	22	20.6	78	72.9	0.597
High	18	24.0	24	32.0	33	44.0		2	2.7	14	18.7	59	78.7		8	10.7	17	22.7	50	66.7	

Figure (5): Correlation between pregnant women total score of knowledge and total score of reported feeding practices

Table (1): Presents that 35.4 % of studied pregnant women were aged ≥ 30 years with mean ± SD 27.63 ± 5.32. Also illustrates that 57.4%, 86.0%, 50.9% and 48.0% of them had secondary education, were house wives, from rural area and in low social class respectively.

Figure (1): Represents that 30.0%, 76.0%, 12.0% and 2.6% of studied pregnant women had three or more previous pregnancy, had<18 month pregnancy space, with history of low birth and with history of low birth length respectively. And 76.9%, 7.7% and 3.4% of studied pregnant women token medication during pregnancy, suffered from anaemia and suffer from thyroid dysfunctions respectively

Figure (2): Clarifies that 88.0% of the studied pregnant women didn't suffer from subsequent diseases during previous pregnancies. As well as; 96.6% of them weren't suffer from thyroid dysfunctions.

Figure (3): Knowledge score was improved from pre to post test that means presence of statistically significant difference between pre &post-test (p1). Also the knowledge of follow up test was decreased than post-test but still more than pre-test with statistically significant difference in all knowledge.

Figure (4): The reported feeding practice was improved from pre to post test that means presence of statistically significant difference between pre &post-test in all of reported feeding practices. Also the reported feeding practice of follow up test was decreased than post-test but not less than pre- test with statistically significant difference in all reported feeding practice.

Table (2): Clarifies that highly statistically significant difference between total knowledge scores and

mother education at pre, post and follow up test P= 0.000, 0.000, 0.029 respectively.

Table (3): Demonstrates that highly statistically significant difference between total practices scores and mother education at pre-test P= 0.000 and there was no statistically significance difference between total score of reported feeding practices at post and follow up test in all items.

Figure (5): Reveals that there was a positive correlation between total knowledge scores and total practices scores in pre-test (r=0.356).There was statistically significant correlation between knowledge and practice (P= 0.000).

Discussion
Reducing stunting is part of the (WHO) Sustainable Development Goals (SDGs). The WHO reported that stunting is in some regions affects 1 in every 3 children. In many countries, interventions to reduce stunting have been implemented during pregnancy. Poor maternal reproductive health and nutrition during pregnancy has lifelong impacts on the health of the offspring. Furthermore, inadequate infant and child feeding practices, repeated infection, and inadequate psychosocial stimulation in the first 1000 days of a child's life strongly contribute to stunted growth and development. These serious health problems contribute to high health care costs of a country; therefore, effective prevention is needed to reduce the prevalence of stunting **(WHO, 2020, Alam et al, 2020, Dhaded et al, 2020 & Titaley et al, 2021)**.

The present study aimed to evaluate the impact of educational program regarding nutritional stunting on the knowledge of pregnant women and the reported

child feeding practices at Sohag Governorate.

With regard to socio-demographic characteristics of the participated pregnant women, the present study showed that more than one third of them were aged ≥30 years; and about half of them were in the low social class according to **Abdel El-twab scale, (2012)**. These findings agreed with **Zelalem et al, (2017)** who carried out a study in Addis Ababa entitled effect of nutrition education on pregnancy specific nutrition knowledge and healthy dietary practice among pregnant women that found more than one third of the pregnant women were in the age group ≥ 30 years and with **Titaley et al, (2021)** who studied the determinants of the stunting of children under two years old in Indonesia and reported that more than two-fifths of the studied women were at the low social class. On other hand, more than one third of pregnant women were had two previous pregnancies similar findings reported by **Permatasari et al, (2021)** who performed study in Indonesia entitled the effect of nutrition and reproductive health education of pregnant women and noticed that more than two-thirds of the studied mothers had pregnancy spacing <18. This was constant with findings reported by **Mahama & Addae, (2020)** who performed a cross-sectional study in the United States entitled dietary supplement use and its micronutrient contribution during pregnancy and lactation.

The current study highlighted that there were highly statistically significance differences between the studied pregnant women knowledge and their reported feeding practices of child in pre, post and follow-up. Moreover, **Permatasari et al, (2021)** recorded that there was poor score of knowledge about nutrition among pregnant women before the program intervention while the results showed that knowledge score became significantly higher among them after the program implementation. In addition, **Mistry et al, (2019)** who performed a post-program comparison study in Colombia entitled maternal nutrition counselling is associated with reduced stunting prevalence and improved feeding practices in early childhood: and observed that providing nutrition and reproductive health education through small groups with interactive methods improves the knowledge, attitudes and practices of pregnant women. On the other hand; this results was in consistent with the observations recorded by **Hitachi et al, (2019)** who performed a community-based cross-sectional study in rural and urban Niger entitled correlates of exclusive breastfeeding practices and reported the importance of educate mothers through individual counselling or group education. Lack of the knowledge resulted in poor nutritional habits. The baseline data of the current study reflected poor in dietary knowledge, safe preparation and food storage,

mainly dietary requirements for pregnant women and child and nutritional intake is unsatisfactory and lower than recommended dietary allowance.

In accordance to the relation between socio-demographic characteristics and total knowledge score regarding nutritional stunting; there were statistical significance differences between score of knowledge and level of mothers' education, father education and mother occupation. This result was in the same line with **Dhaded et al, (2020)** who performed a study in South Asia entitled preconception nutrition intervention improved birth length and reduced stunting and wasting in new-borns. This may be attributed by that more than half of the studied pregnant women had secondary education and the most of them were housewives, so they had health awareness regarding their child health and seeking help as early as possible.

While there weren't relationship between maternal age and their residence with total score of knowledge, this was versus the results reported by **Beal et al, (2018)** in Indonesia who conducted review of child stunting determinants and reported the presence of relationship with age and residence in conjunction with the total score of knowledge.

The present study illustrated that there was statistical significance difference between reported feeding practices and level of mother's education. This record was in in agreement with **Simanjuntak et al, (2019)** in Malaysia who studied maternal knowledge, attitude, and practices about traditional food feeding with stunting and wasting of toddlers and reported that there was highly statistical significance difference between reported feeding practices and level of mother's education. In contrast, this observation was opposite with the results of **Deepti, (2019)** who studied in rural Punjab the knowledge, attitude, practice and determining factors regarding nutrition during pregnancy among females and observed that there was no statistical significance difference between child weaning and level of mother's education.

The present study showed that there was a positive correlation between knowledge and practices in pre-test among mothers about reported feeding practices. This can be attributed to the effect of knowledge on improvement of practice. This finding similar with **Javid et al, (2020)** in Bangladesh who studied child malnutrition: trends and issues and reported that there was statistically significant correlation between knowledge and practice.

Conclusion:

The present study concluded that the educational program was effective in improving knowledge of the pregnant women and their reported feeding practices for child regarding nutritional stunting in the study area.

Recommendations:

1) Increase awareness of mothers through mass media about nutritional stunting among children under two years old.

2) Further educational program for mothers in different settings to include larger number of them.

3) Continuous supervision by health workers, such as nutritionists, public health workers, to ensure that nutrition education program to prevent nutritional stunting among children continue through the first 1000 day of a child life, as a critical period of infant growth and development.

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