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Assessment of Mothers' Knowledge and Reported Practices Regarding Prevention of Vitamin A Deficiency among Children

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Abstract

Nutrition is an important part of a child's growth and development. Vitamin A helps boost immunity and protects children under five years from diseases and blindness. **Aim:** This study aimed to assess mothers' ' knowledge and reported practices regarding the prevention of vitamin A deficiency among children**. Design**: A descriptive research design was utilized in this study. **Setting:** This study was conducted in the Maternal and Child Health Center Helwan Awal, Helwan district, Cairo Governorate. **Sample:** A convenience sample included 400 mothers'. **Tool:** The interview questionnaire consisted of 3 parts; mothers' and child socio-demographic characteristics, mothers' ' knowledge, mothers' reported practices about vitamin A deficiency. **Results**: 21% of the mothers' had a satisfactory level of total knowledge, and 38.2% of them had adequate reported practices. **Conclusion**: There were a statistically significant positive correlation between total knowledge and reported practices regarding the prevention of vitamin A deficiency among the studied mothers' **Recommendations**: Ongoing researches were required to enhance mothers' ' awareness about vitamin A deficiency prevention.

Key words: *Mothers' knowledge, Reported Practice, Vitamin A Deficiency.*

I.Introduction

Children are the most important segments for a nation for the optimal physical, mental, emotional development. A nation's health depends on the healthy citizen. Nutrition of under five years' children is very important as health, strength and intelligence which develop during this period. Good nutrition is the fundamental basic right for the maintenance of positive health. [4]

Vitamin A is a fat-soluble vitamin that is an essential nutrient. The term "vitamin A" encompasses a group of chemically related organic compounds that includes retinol, retinol esters, and several provitamin carotenoids, most notably beta-carotene.

The estimated prevalence is 2.8 million children have xerophthalmia. VAD is most prevalent in Africa, Mali, Ethiopia, Nigeria and Egypt. The highest incidence of VAD is almost occurring in children of low income and non- industrialized countries. Also in Egypt, vitamin A deficiency in children is 9% and the prevalence of night blindness in children is 1%. [25]

Assessment about vitamin A deficiency is important in controlling the of the disease. Knowing the vitamin, A deficiency cause, signs/symptoms, and the possible methods of prevention can facilitate the proactive

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application of preventive measures. Information about of the vitamin A deficiency considers of significant value in providing the required strategies to be carried out. Moreover, these would enhance and evaluate the presently available programs as well as recognize possible interventions to improve the behavioral changes. Positive behavioral changes are driven by the level of knowledge and perceptions towards preventive practices. [3]

The main underlying cause of Vitamin A Deficiency (VAD) as a public health problem is a diet that is chronically insufficient in vitamin A that can lead to lower body stores and fail to meet physiologic needs. Deficiency of sufficient duration or severity can lead to disorders that are common in vitamin A deficient population such as xerophthalmia, the leading cause of preventable childhood blindness, anemia, and weakened host resistance to infection, which can increase the severity of infectious diseases and risk of death [9]

Vitamin-A deficiency is seen more commonly in under five years' children and affects their eyes and can lead to blindness. It causes "xerophtalmia 'which mean dry eyes, characterized by series of clinical signs. These include night blindness, conjuctival xerosis, Bitot-spots, corneal ulceration, karatomalacia and Corneal scar. Dietary deficiency of vitamin-A most commonly and importantly affects the eyes, and can lead to blindness [20]

Community health nurse, can play an important role in identifying the children with vitamin A deficiency and also giving information to their mothers' ' about vitamin A deficiency and its prevention, because the mothers' ' have essential role in protecting their children from any disease especially vitamin A deficiency.so the nurse should give health education for the mothers' ' to gain knowledge, skills necessary to maintain and promote their health, maintain ideal nutrition, giving them foods rich in vitamin A, observe of any symptoms of vitamin A deficiency in their children [14]

Significance of the Study

Vitamin A deficiency has a serious effect on health as it is the second most important cause of global blindness and also affects growth, general morbidity, and mortality. Every year 2.50.000 to 500.000 children become blind, partially or totally due to vitamin A deficiency, and this lowers the resistance power of these children against infection due to damage to the immune system. Therefore, increasing the risk of mortality from common diseases arising from vitamin A deficiency, especially among young children. [6]

The estimated prevalence is 2.8 million children have xerophthalmia. VAD is most prevalent in Africa, Mali, Ethiopia, Nigeria, and Egypt. The highest incidence of VAD almost occurs in children of low-income and non-industrialized countries. Also in Egypt, vitamin A deficiency in children is 9% and the prevalence of night blindness in children is 1%. [11] So, the current study aimed to assess mothers' ' knowledge and reported practices regarding the prevention of vitamin A deficiency among children.

Aim of the study

This study aimed to: Assess mothers' ' knowledge and reported practices regarding the prevention of vitamin A deficiency among children through:

Assess the knowledge of mothers' regarding the prevention of vitamin A deficiency among children.

Assess reported practices of mothers' regarding preventing vitamin A deficiency among children.

Research Questions:

1. What are the level of knowledge about vitamin A deficiency?
2. What are the level of reported practices regarding vitamin A deficiency?
3. Is there a relation between mothers knowledge and reported practices regarding vitamin A deficiency?

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II. Subjects and Methods

Research design:

A descriptive research design was utilized in this study.

Research setting:

The study was conducted at one Maternal and Child Health Center (MCH) called Helwan Awal, Helwan district, Cairo Governorate. It included: One floor: The first floor included a medical director's office, nursing director office, emergency room, vaccination clinic, child follow-up clinic, family planning clinic, dental clinic, laboratory investigation room, pharmacy, sterilization room, initiative room, and 2 bathrooms. The center introduces the services as child vaccination from one day to 18 months and giving vitamin A capsule every six months until 4 years early detection for diseases by follow up of child growth and development and family planning services.

Sample:

A convenience sample included 400 mothers' from a total number of 5600 attended to vaccination clinic at Helwan Awal Maternal and Child Health Center in the previous year (from January to December 2021).

Tools for data collection:

The data were collected through using the following tool:

1st Tool: Structured interview questionnaire: - It was developed by the researcher based on the literature review, it comprised the following parts: -

Part I: - Demographic characteristics of mothers' ' and their children, it covered the following items:

The mother characteristics included: - Age, educational level, occupation, residence, monthly income, number of children, number of family members, number of rooms and crowding index. 9 questions

The child characteristics included: - Age, gender, method of child delivery and rank of child between sibling. questions from number 4 questions

Part II: Mothers' ' knowledge regarding vitamin A and its deficiency: -

This tool was adapted from Maces and Glasauer, (2014), and modified by the researcher. This tool aimed to assess the mothers' ' knowledge about vitamin A included; meaning, importance, needed amount of vitamin A for children, animal foods which are rich in vitamin A, vegetables which are rich in vitamin A, fruits which are rich in vitamin A and breast milk a source of vitamin A and as knowledge about vitamin A deficiency as meaning, the most susceptible age to vitamin A deficiency, symptoms of vitamin A deficiency, causes of vitamin A deficiency, complications of vitamin A deficiency and Preventive methods of vitamin A deficiency.

Scoring system for knowledge:

Knowledge questions included 13 questions which were scored as the following:

- Complete correct = two points.
- Incomplete correct = 1 point.
- Don’t know/ incorrect = zero point.

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The total score of knowledge were ranged from 0-26 points and classified as the following:

- Unsatisfactory level of total knowledge if mother took < 60% (<16 points).
- Satisfactory level of total knowledge if mother took ≥ 60% (≥16 points).

Part III: Mothers' ' reported practices regarding vitamin A intake for their children: -

This part was used to collect data about vitamin A capsules are given to the child during vaccination, child was given vitamin A capsules, child is given vitamin a capsules at the age of 12 months to 5 years, child is given liver once a week, child eats eggs 3-4 times a week, child eats milk and dairy products 2-3 times a week , child eats green vegetables rich in vitamin a daily, child eats color vegetables rich in vitamin A daily and child eats fruits rich in vitamin a 2-3 times a week.

Scoring system for practice items included 9 questions scored as the following:

- Done = one point,
- Not done = zero point.

The total reported practices: Calculated for each mother by adding the score of all items of the reported practices. It ranged from 0-9 points and classified as the following:

- Inadequate reported practices < 60% (< 5points)
- Adequate reported practices ≥ 60% (≥ 5points)

Validity:

The tool validity was done by 3 of Faculty staff nursing experts in the field of experts in community health nursing, Faculty of Nursing, Helwan University, specialties reviewed the tool for clarity, relevance, comprehensiveness, applicability, and reliability.

Reliability

Reliability coefficients were calculated for the questionnaires of assessment of mothers' ' knowledge and reported practices regarding prevention of vitamin A deficiency among children ,maternal and child health , Cronbach's Alpha for their knowledge was 0.85 and for their reported practices was 0.84.

Ethical considerations:

An official permission to conduct the proposed study obtained from the Scientific Research Ethics Committee Faculty of Nursing, Helwan University. Participation in the study was voluntary and subjects were given complete full information about the study which included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of the information where it not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs were respected.

Pilot study:

The simplicity, clarity, and applicability of the tool was evaluated in a pilot study involving 10% of the entire sample (40 mother). The time required to collect the questionnaire was determined as well as any problems during data collection were identified. Since no modifications were made, pilot study participants were included within the total sample size.

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Fieldwork

An official letter was issued from the Dean of Faculty of Nursing Helwan University, and was directed to the manager of the MCH centers in Helwan district, Cairo Governorate included the aim of the study to obtain permission after establishing a trustful relationship. Each mother was interviewed individually by the researcher to explain the study purpose. Data was collected during 3 months (from beginning of January to end of march 2023) two days/week (Saturday and Sunday) from 10 am -1 pm till the needed sample was completed. Informed consent was obtained from mothers' ' after the researcher introduce herself for them then the study was conducted by distribution of the tool for them. Time needed to complete the tool was 15-20 minutes.

Statistical analysis:

Data entry and analysis were performed using SPSS statistical package version 25. Categorical variables were expressed as number and percentage while continuous variables were expressed as (mean ±SD). Chi-Square (x2) was used to test the association between row and column variable of qualitative data. Comparison of quantitative variables between the study groups was carried out using the student t-test for independent samples to compare two groups when normally distributed. Pearson correlation was done to measure correlation between quantitative variables.

Pearson correlation was done to measure correlation between quantitative variables. Degrees of the significance of results were considered as follows: P-value > 0.05 not significant (NS), p-value ≤ 0.05 statistically significant (S) and p.-value ≤ 0.001 highly statistically significant (HS).

III. Results

Table 1 shows that, 63.8% of the studied mothers' ' were in age group 35 - ≤ 40 years with mean age 35.13±9.36 years and 60.7% of them had university education or more. Also, 70.0% of them were housewifes and 76.5% of them were from rural residence. Additionally, 53.3% of them reported not enough income. Also, 45.5% of the studied mothers' ' had 3-4 children and 52.8% of them had family consisted of 3-5 members. Also, 42.3% of them had two rooms in their homes.

Table 2 shows that, 49.3% of the studied children were in age group >10 years with mean age 9.92±2.65 and 67.2% of them were females. Also, 67.0% of them were delivered by cesarean section and 42.5% of them were the third child.

Fig.1 illustrates that, 22.5% of the studied mothers' ' had satisfactory level of total knowledge.

Fig. 2 shows that, 38.2% of the studied mothers' ' had adequate total reported practices levels related to vitamin A deficiency.

Table 4 shows that, there was a significant statistically relation between monthly income of the studied mothers' ' and their total level of knowledge P-value=0.010.

Table 5 shows that, there were no significant statistically relation between age, educational level, occupation, residence and monthly income of the studied mothers' ' and their total level of reported practices (P-value=0.749, 0.903, 0.982, 0.473 and 0.204) respectively.

Table 6 shows that, there was a significant statistically positive correlation between total level of knowledge and reported practices at (P-value=0.030).

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Table (1): Frequency Distribution of the Studied Mothers' According to their Socio- demographic Characteristics (n=400).

Mothers socio- demographic characteristics	No	%
Age (years)		
25 - <30	30	7.5
30 - <35	115	28.7
35 - ≤ 40	255	63.8
Mean ±SD	35.13±9.36	
Educational level		
Can't read and write	20	5.0
Read and write	22	5.5
Basic education	50	12.5
Secondary education	65	16.3
University education or more	243	60.7
Occupation		
Housewife's	280	70.0
Working	120	30.0
Residence		
Rural	306	76.5
Urban	94	23.5
Monthly Income		
Not enough	213	53.3
Enough	142	35.5
Enough and save	45	11.2
Number of children		
1-2	113	28.2
3-4	182	45.5
4-5	93	23.3
>5	12	3.0
Number of family members		
3-5	211	52.8

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6-8	102	25.5
>8	87	21.7
Number of rooms		
One	17	4.2
Two	169	42.3
Three	104	26.0
Four	72	18.0
Five	34	8.5
Crowding index		
<1	141	35.2
1-<2	197	49.3
≥2	62	15.5

Table (2): Frequency Distribution of the Studied Children according to their Demographic Characteristics (n=400).

Child socio- demographic characteristics	No	%
Age (years)		
<5	69	17.2
5-10	134	33.5
>10	197	49.3
Mean ±SD	9.92±2.65	
Gender		
Male	131	32.7
Female	269	67.3
Method of child delivery		
Normal	132	33.0
Cesarean section	268	67.0
Rank of child between sibling		
First	61	15.2
Second	98	24.5
Third	170	42.5
Fourth	64	16.0
Fifth or more	7	1.8

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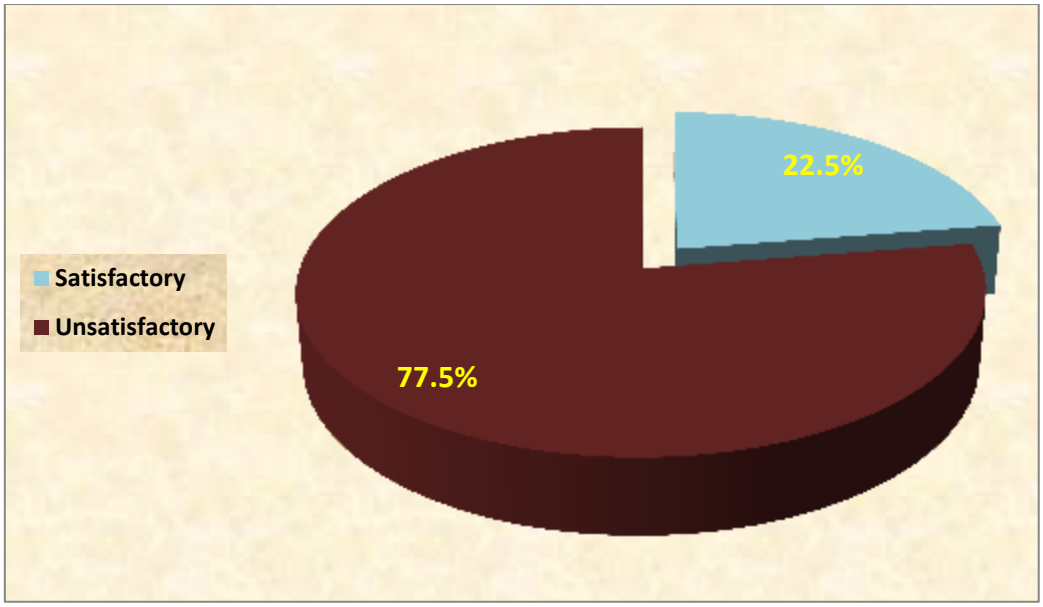

Figure (1): Percentage Distribution of the Studied Mothers' Total Level of Knowledge about Vitamin A Deficiency (n=400).

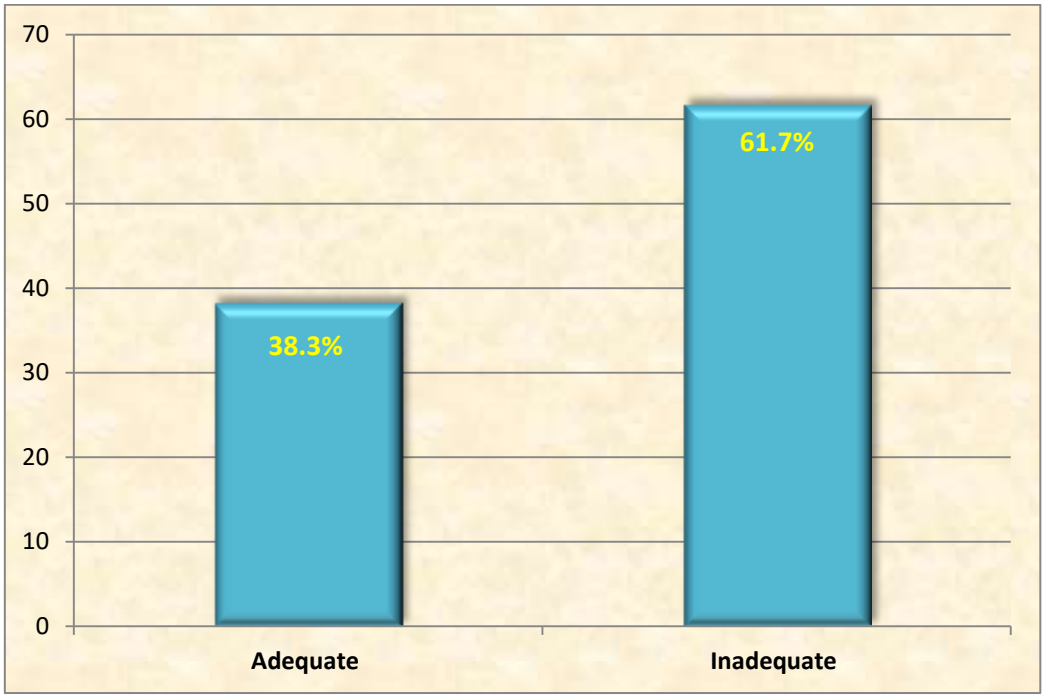

Figure (2): Percentage distribution of the Studied Mothers' Total Level of Reported practices related to Vitamin A Deficiency (n=400).

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Table (4): Relation between Socio-demographic Characteristics of the Studied Mothers' and their Total Level of Knowledge (n=400).

Socio- demographic characteristics		Total level of knowledge				X^2/FET	P-value
		Satisfactory (n=90)		Unsatisfactory (n=310)			
		No	%	No	%		
Age (in years)	25<30	5	1.2	25	6.2	1.561	0.458
	30-<35	30	7.5	85	21.2		
	35≤ 40	55	13.8	200	50.0		
Educational level	Can't read and write	4	1.0	16	4.0	2.398	0.494
	Read and write	9	2.2	13	3.2		
	Basic education	9	2.2	41	10.2		
	Secondary education	19	4.8	46	11.5		
	University education	49	12.2	194	48.5		
Occupation	House wife	59	14.8	221	55.2	1.092	0.180
	Working	31	7.8	89	22.2		
Residence	Rural	65	16.2	241	60.2	1.182	0.172
	Urban	25	6.2	69	17.2		
Monthly Income	Not enough	60	15.0	153	38.2	9.224	0.010*
	Enough	25	6.2	117	29.2		
	Enough and save	5	1.2	40	10.0		

Non-significant at P-value > 0.05 *Significant at P-value ≤ 0.05

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Table (5): Relation between Socio-demographic Characteristics of the Studied Mothers' and their Total Level of Reported Practices (n=400).

Socio- demographic characteristics		Total level of reported practices				X^2/FET	P-value
		Adequate (n=153)		Inadequate (n=247)			
		No	%	No	%		
Age (in years)	25<30	10	2.5	20	5.0	0.461	0.794
	30-<35	46	11.5	69	17.2		
	35≤ 40	97	24.2	158	39.5		
Educational level	Can't read and write	8	2.0	12	3.0	0.569	0.903
	Read and write	6	1.5	16	4.0		
	Basic education	20	5.0	30	7.5		
	Secondary education	27	6.8	38	9.5		
	University education	92	23	151	37.7		
Occupation	House wife	107	26.8	173	43.2	0.001	0.982
	Working	46	11.5	74	18.5		
Residence	Rural	120	30.0	186	46.5	0.514	0.473
	Urban	33	8.2	61	15.2		
Monthly Income	Not enough	90	22.5	123	30.8	3.179	0.204
	Enough	47	11.8	95	32.8		
	Enough and save	16	4.0	29	7.2		

Non-significant at P-value > 0.05

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Table (6): Correlation between Total Level of Knowledge and Reported Practices among the Studied Mothers.

Variables	Total level of knowledge	
	R	P-value
Total level of reported practices	0.551	0.030*

*Statistically significant at P-value ≤ 0.05

IV. Discussion

Vitamin A deficiency (VAD) is a significant public health concern, particularly among children under five years. Vitamin A deficiency can have devastating consequences for children's health. It weakens their immune system, making them more susceptible to infections like measles and diarrhea, which can be deadly. Additionally, VAD can lead to night blindness, potentially hindering their development and education. [10] Therefore, this study aimed to assess Mothers' ' knowledge and reported practices regarding prevention of vitamin A deficiency among [6]

Regarding the studied mothers socio-demographic characteristics, the current study found that more than three-fifths of them were aged 35≤ 40 years with a mean age of 35.13±9.36 years (Table 1). In contrast, Mohamed et al., [17] studied the "Effectiveness of a Community-Based Nutrition Education Program on Maternal Knowledge and Practices Regarding Vitamin A-Rich Foods "in Sudan, (n=200) who found that 81% were below 30 years.

Also, these results were contradicted by Varghese, et al., [21], who studied "knowledge and practice regarding vitamin A prophylaxis among mothers' ' of children under-five years, in India (n=100) subjects, and found that 42% of mothers' ' from 26 to 30 years.

In addition, the present study reported that less than three-quarters of them were housewife's. This result was in agreement with Woldegebriel et al., [23], who conducted a study titled "Associated factors among children aged 6-59 months" in Ethiopia (n= 5161) and reported that 75.4% of them were not working. While Mohamed et al., [17] disagreed with the current finding and found that all their studied mothers were housewife's. Moreover, Ali, et al., [2] contradicted and found that 100% of their studied mothers were housewife's.

The current study found that more than half of mothers' ' not had enough income. These results were incongruent with, Mangusho et al., [12] studied" Vitamin A-related nutrition knowledge gaps and predictors among caregivers of preschool children in Africa "(n= 247) and found that 92% of their studied caregivers were low monthly household income.

As regards children's demographic characteristics, the current study reported that nearly half of the studied children were aged >10 years with a mean age was 9.92±2.65. (Table 2).

These findings were in consistent with Woldegebriel et al., [23] who mentioned the mean (±SD) age was 26.6 months (SD±2.1) of the total childreVCn, 33% of them were in the age group 12-23 months.

Additionally, the current study reported more than two-thirds of them were female children. This finding was agreed with Abdel-Wahab et al., [1], who conducted a descriptive research design about "Mothers' ' knowledge, practices, and attitudes regarding their preschool children with Xerophthalmia", in Benha, Egypt, and reported that 65% of their studied children were females.

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This might be due to providing tips about vitamin A-rich foods in the empowered mothers' ' to apply the knowledge and improve their children's vitamin A intake.

Moreover, Sathiyabama, [18] who studied "Assess the effectiveness of a structured teaching program on prevention and management of vitamin-A prophylaxis" in India (n=60) congruent and mentioned that in their knowledge, 100% of their studied mothers' ' had inadequate knowledge of the prevention and management of Vitamin A. 36.67% of them had moderately adequate knowledge, and 1.67% had inadequate knowledge on prevention and management of Vitamin A prophylaxis among mothers' ' of under-five children. These findings were consistent with Shanthi, [19] who found that there is no significant association of knowledge score with demographical variables such as the age of the mother, religion, educational status, source of information, and number of children.

This might be due to the design to convey clear and effective information that leads to a significant increase in mothers' knowledge regarding vitamin A and its causes.

Corresponding to the mothers reported practices about vitamin A deficiency related to children given vitamin A capsules during vaccination, the current study showed that one fifth of the studied mothers always practice about children given liver once a week, almost two-thirds of them always practice about child eats egg 3-4 times per week, which increased to the majority post-program. Consequently, the studied mothers' ' had an improvement in their reported practices regarding vitamin A deficiency in relation to the prevention vitamin A deficiency with a highly statistically significant difference.The present study showed that less than two-fifths of the studied mothers' ' had adequate total reported practices level related to vitamin A deficiency. These results agreed with Hossain et al., [7] who found statistically significant improvements in mothers' ' practice regarding vitamin A deficiency the mean practice score of the 10.9 ± 2.3.

The present study reported that there was a significant statistical relation between the monthly income of the studied mothers' ' and their total level of knowledge pre-program implementation. While, there was no significant statistical relation between the age, educational level, occupation, and residence of the studied mothers' ' and their total level of knowledge. Table 4

Moreover, Sathiyabama, [18] reported that there was a significant statistical relation between the monthly income of the studied mothers' ' and their total level of knowledge at $p < 0.05$. While, there was no significant statistical relation between the age, educational level, occupation, and residence of the studied mothers' ' and their total level of knowledge.

This might be due to mothers' ' with higher income might have greater access to resources like educational materials, internet connectivity, or healthcare consultations, potentially leading to a higher baseline knowledge of vitamin A deficiency.

The present study showed that there were no significant statistical relation between the age, educational level, occupation, residence, and monthly income of the studied mothers' ' and their total level of reported practices. Table 6 These findings were agreed by Li et al., [13], who conducted a cross-sectional study titled" influence of maternal education and child health practices", in China, (n=167) and found that in pre-program practices there was no significant relationship between mothers socio-demographic characteristics (age, education, occupation, residence, income) and their total level of mothers' ' health practices.

Also, these findings were consistent with Hossain et al., [7] found that no significant relationship between mothers demographic characteristics and mothers practices regarding vitamin A deficiency prevention practices.

Correlation between total level of knowledge, practices, among the studied, the current study found that there was a significant statistically positive correlation between the total level of knowledge and practices. In accordance with these findings, Asriyani et al., [4] consistently found that there was a significant statistically

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positive correlation between motherstotal level of knowledge about vitamin A deficiency and their total level of practices related to prevention. This means mothers' ' with more knowledge (e.g., the importance of vitamin A, symptoms of deficiency) were more likely to report better practices. This positive correlation between knowledge and practices. Similarly, Atabaki et al. [5] found that there is a significant statistically positive correlation between mothers' ' total level of practices

This might be due to mothers' ' with higher initial knowledge about vitamin A deficiency also more likely to report better practices. suggesting the might have reinforced the connection between knowledge and practices.

V. Conclusion

On the light of results of the current study and answers of the research questions, it could be concluded that; Minority of them had complete correct knowledge about the vitamin A deficiency among children. Less than half of the studied had unsatisfactory level of reported practices, while more than one-quarter of them had satisfactory level of reported practices regarding vitamin A deficiency among children. Also, there was a highly statistical significant positive correlation between students' total level of knowledge and reported practices regarding vitamin A deficiency among children.

VI. Recommendations

On the light of the current study findings the following recommendations were suggested:

1. Counseling program were required for mothers' ' in MCH centers and pediatric clinics regarding nutritional needs especially vitamin A supplementation for children.
2. Witten guidelines about vitamin A in the form of booklets or brochures should be provided to mothers' ' in order to encourage them to prevent children vitamin A deficiency.
3. Develop and implemented health educational sessions for mothers' ' of children with vitamin A deficiency to improve their knowledge and practices toward care of their children.

Further research's:

- Ongoing researches in different settings were required for enhancing mothers' ' awareness about vitamin A deficiency prevention.

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