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Mothers' Perception for their Children Suffering from Favism

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Abstract

Background: Favism is condition causing adverse reactions to fava beans and certain other triggers, can be particularly challenging for children and their families. Mothers, often the primary caregivers, play a critical role in managing their child's condition. **Aim**: To assess mother's perception for their children suffering from favism. **Design:** A descriptive research design was utilized. **Setting:** This study was conducted at pediatrics and hematology outpatient clinics at Helwan General Hospital, El Nasr Hospital, and 15 May Hospital. **Sample**: A purposive sample of 197 mothers who had children diagnosed with favism. **Tool:** A structured interview questionnaire was divided into 4 parts: part 1: Demographic data for mothers and their children, Part 2: Mothers' knowledge regarding favism, Part 3: Mothers' attitude regarding favism, and Part 4: Mothers' reported practice about favism. **Results:** 80.2% of studied mothers had poor level of total knowledge about favism, and 13.7% and 6.1 of them had an average and good level of knowledge about favism respectively. Also, 86.8% of studied mothers had negative attitude about favism, while and 57.4% of them had inadequate reported practice about favism. **Conclusion:** The majority of studied mothers had poor levels of total knowledge and negative attitude about favism, while, more than half of them had inadequately reported practices. Finally, there was a statistically significant positive correlation between total knowledge, total reported practices and total attitude of the studied mothers regarding favism. **Recommendations:** Developing an educational program to increase mothers' awareness about favism.

Keywords: *Children, Favism, Mother's perception*

INTRODUCTION

Favism refers to a hemolytic reaction that occurs upon consumption of fava beans. It is also known as Glucose-6-phosphate dehydrogenase deficiency (G6PD), an inherited condition characterized by the destruction of red blood cells. This condition has the potential to result in moderate to severe hemolytic anemia. There is an overrepresentation of male cases in comparison to female cases. Male individuals exhibit hemizygosity for the G6PD gene *(Elgamal et al., 2020).*

Hemolysis may arise due to free radicals and reactive oxygen species generated by various stressors. The three primary factors that can initiate a response are infections, specific medications, and particular types of food. Infection is frequently identified as the primary cause of acute hemolytic anemia in individuals with favism, particularly those with pronounced deficiency and concurrent conditions such as cytomegalovirus, hepatitis A and B, pneumonia, or typhoid fever. Certain medications may be used cautiously, but it may be necessary to administer lower doses, especially in patients with more severe forms of deficiency *(Luzzatto et al., 2020)*

The onset of acute hemolytic anemia resulting from consuming fava beans, also known as favism, can occur swiftly. A child may experience a mild increase in body temperature within 24-48 hours, accompanied by symptoms such as irritability, lethargy, and tachycardia. The three significant symptoms of acute hemolysis were pallor, icterus, and dark urine. Following the manifestation of these symptoms, there was an increased frequency of abdominal pain, vomiting, and drowsiness *(Alqahtani et al., 2022)*

Favism is commonly diagnosed by conducting an assessment of the child's drug and food intake history and considering the presence of corresponding symptoms. It is also important to note any previous instances of such episodes are crucial for understanding the severity of the condition that has been reported *(Yousuf & Arshad, 2021)*

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Managing a child with favism relies on the level of awareness and knowledge that mothers possess regarding the factors that can trigger the condition. Therefore, it is advisable for the mother to carefully inspect any items given to her child and verify that they are free from such substances. It is advisable to seek medical consultation from a doctor if a child has been exposed to any disease. This will ensure that the child receives the necessary treatment *(Gad et al., 2020)*

Additionally, perception is the process of recognizing and interpreting sensory stimuli. Also, perception is a process by which individuals organize and interpret sensory impressions to give meaning to the environment. Perception is the first event in the chain that leads from the stimulus to action. Perception is a process rather than a product or outcome of some psychological phenomena *(Sah, 2022).*

Mothers' perceptions regarding the dangerous clinical features of their children are very important in influencing mothers' decisions about seeking medical care. As regards favism in children the assessment of mothers' knowledge and reported practices toward dangerous clinical features to help in reducing exposure to hemolytic attacks and the occurrence of child complications *(Sunita et al, 2020).*

Community health nurses (CHNs) play a crucial role in identifying and preventing precipitating factors that can cause a hemolytic crisis in patients with G6PD deficiency. This is achieved by actively avoiding trigger factors, including specific medications. Conducting a comprehensive physical assessment and obtaining accurate baseline vital signs are crucial before initiating a blood transfusion *(Shokr & El Kotb, 2022).*

Significance of the study:

In Egypt, the prevalence of favism has been estimated to be 4.8% of children with acute hemolytic attacks, it is common among males between the ages of 2 and 10 years. Moreover, the prevalence of G6PD deficiency is more male than female (Ata et al., 2020).

The Institute for Health Metrics and Evaluation (IHME), (2019) population witnessed a significant number of individuals born with G6PD deficiency, reaching 8.96 million. Furthermore, the prevalence of G6PD deficiency among the global population was estimated to be 438 million individuals. G6PD deficiency accounted for 13,000 deaths across all age groups, with 367 fatalities in children under five years old

The community health nurse plays an essential role in increasing mothers' awareness through maternal and child health care via continued health education, physical, clinical examination, and observation for any abnormality for children and counseling supplementary food, immunization, and early recognition and treatment of any aliment (Rai &Kumar, 2020).

Ain of the study:

This study aims to assess mother's perception for their children suffering from favism through this objective:

1. Assess mothers' knowledge about favism.
2. Determining mothers' attitude about favism.
3. Appraising mothers' reported practice about favism.

Research questions:

1. What are mothers' knowledge about favism?
2. What are mothers' attitudes about favism?
3. What are mothers' reported practices about favism?
4. Is there relation between mothers' knowledge, attitude and reported practices and their demographic characteristics.

Subject and Methods:

The methodology of this study was presented with four main designs as follows:

i. Technical item
ii. Operational item
iii. Administrative item
iv. Statistical item

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I. Technical item:

The technical design for this study included research design, research setting, subjects, and tool of data collection.

Research item:

A descriptive design was used to achieve the aim of the current study.

Study Setting:

The current study was conducted at three hospitals. The first pediatrics and hematology outpatient clinics at Helwan General Hospital, which was located on the second floor and consisted of one entrance and one window, two doors, 3 desks one for nurses and two for doctors, and one note logbook for recording the cases by nurses.

Second, 15 May Hospital Pediatrics and hematology outpatient clinics were located on the first floor and consisted of two entrances one from the central gate for the outpatient, clinic and another door from the emergency clinic consisting of two disks one for the doctor and one for the nurse and one stretcher for examination and log book for recorded cases by the nurse.

Third, El Nasr Hospital's pediatric outpatient clinic was located on the first floor and consisted of one entrance, one window, one door, and two disks one for the doctor and one for the nurse all of these clinics, have weight and height scales and were open daily except Friday.

Sampling type and size:

A purposive sample of 197 mothers who had children diagnosed with favism was used according to the following sample size equation: n=N(1+N(e2)); where,

n= sample size,

N= population size was 400,

e=,05 is the level of perception (Krejci and Morgan, 2018), and

n= 400 (1+400 (,005) = 197

Tools of Data Collection:

The data in this study were collected by structured interview questionnaires that were divided into 4 parts:

Part I: Demographic Characteristics of the study sample and medical history of the studied children, including three subitems:

A. Demographic Characteristics of Studied Mothers: It consisted of seven questions about; age, education level, marital status, occupation, monthly income, number of family members and place of residence.

B. Demographic Characteristics of studied children included four questions about age, sex, level of education, and rank between siblings.

C. Past and present medical history of children included eight questions related to the child's current medical history and five questions related to the child's past medical history.

Part II: Mothers' knowledge regarding favism:

Adapted from El-Bastwese et al., (2020). It was used to assess mothers' knowledge and consisted of 15 questions about favism about meaning, causes, risk factors, signs and symptoms, diagnostic methods, complications, appropriate food for a child who suffers from favism, foods that should avoid a child suffering from favism, ways to avoid the child with disease from complication, treatment, health precaution to be followed, first aid is needed when attacks occur, necessary tests to follow up on the health of the affected child, the importance of follow up and role of the family in the early detection of favism.

Scoring system:

15 questions = 30 points

- Complete correct answer=2 points.
- Incomplete correct answer = 1 point.

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- Don't know = 0 point.

Total mothers' knowledge was 0- 30 points and classified as the following:

- Poor knowledge <50 %= (< 15 points).
- Average knowledge 50 -< 75 = (15-<23 point).
- Good knowledge ≥ 75 % = (≥ 23 points).

Part III: Mothers' attitude regarding favism:

Adapted from **El-Bastwese et al., (2020).** It was used to assess mothers' attitudes regarding favism and consisted of 12 questions about the thought that screening and laboratory investigation helped in the early detection of disease for children, screening the child felt good, giving medication daily therapy regularly was beneficial for the child, following up a child with favism with the doctor was beneficial, periodic follow up the laboratory investigation for the child with favism was important, increasing awareness about favism was useful for dealing with the child condition, following up on the development and growth of the child with favism was useful, a child knowledge about the nature of his illness affects his psychological state, felt empathy and concern for the child with favism over his other siblings felt stressed and burdened while working with my child with favism, knowledge of the school teacher and relatives about the nature of the child's disease was beneficial his healthy condition and health education and premarital examination reduces the incidence of favism.

Scoring system:

12 questions = 36 points categorized as:

- Agree = 3 points.
- Neutral = 2 points.
- Disagree = 1 point.

Total mothers' Attitudes were classified as the following:

- Positive attitude ≥ 60% (22-36point)
- Negative attitude < 60% (<22 point)

Part IV: Mothers' reported practice about favism:

Adapted from **El-Bastwese et al., (2020).** It was used to assess mothers' practice regarding the care of the child with favism and consisted of 13 questions about giving the treatment to the child on time every day, making a spacing between the treatment time and the time of giving, nutritional supplements for the baby, giving the dose of treatment double if they forgot to give it a day, making a written schedule to make sure that the treatment was given to the child, followed a child with favism with the doctor, gave any medication after consulting a doctor, followed up the blood tests of the child to make sure of the right dosages, made a visit to the doctor every once in a while, gave the child compulsory vaccination according to the schedule on time, followed the foods and medications that the child should avoid to prevent, compensated the child for the food misses with vegetables and fruits, gave the child a complete blood transfusion every period of time according to consult a doctor and observe the child after the blood transfusion to know which side effects could occur.

Scoring system:

13 questions=39 points categorized as:

- Always = 3 points.
- Sometimes =2 points.
- Never= 1 point.

The total mothers' reported practice was classified as the following:

- Adequate reported practice ≥ 60% (24-39 points).
- Inadequate reported practice <60% (<24 points).

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Validity and reliability:

The study tools were tested for content and face validity by a jury test of five experts in the field of Community Health Nursing to evaluate the individual items as well as the entire instrument as being relevant and appropriate to test what they wanted to measure. The face validity of the questionnaire was calculated based on experts' opinions after calculating the content validity index (CVI) of its items, and it was 96%.

A pilot study was carried out on 10% of the study mothers and was excluded from the total sample. To assess reliability, the study tool was tested by the pilot subjects for calculating Cronbach's Alpha which was 0.801 for the knowledge questionnaire, 0.992 for reported the practice questionnaire and 0.854 for attitude.

Ethical considerations:

Official permission was obtained for the proposed study from three hospital directors and clinic directors. Participation in the study was voluntary and subjects gave complete full information about the study and their role before signing the informed consent. The ethical considerations included explaining the purpose and nature of the study, stating the possibility to withdraw at any time, and confidentiality of the information where it would not be accessed by any other party without taking permission of the participants. Ethics, values, culture and beliefs would be respected.

Operational Item:

Preparatory phase:

It included reviewing past, current, national, and international related literature, and theoretical knowledge of various aspects of the study using books, articles, the internet, periodicals, and magazines to develop tools for data collection.

Pilot study:

A pilot study was carried out on 10% of 19 mothers and was excluded from the total sample.

Fieldwork:

The data were collected was started and finished within (3) months from beginning of July to end of September 2023. The investigator started the interview with each mother individually to collect the data using the data tools during two days from 9 A.M to 2 P.M(Sunday and Tuesday) till complete the sample. The investigator collected about 8 to 9 cases per day during three months till complete the sample size

II. Administrative Item:

Approval to carry out this study was obtained from the dean of the faculty of nursing at Helwan University.

III. Statistical Item:

The collected data were organized, tabulated, and statistically analyzed using SPSS software (Statistical Package for the Social Sciences, version 26, SPSS Inc. Chicago, IL, USA). For quantitative data, the range, mean, and standard deviation were calculated. Qualitative data, which describes a categorical set of data by frequency, percentage, or proportion of each category, using the Chi-square test (x2). Correlation between variables was evaluated using Pearson's correlation coefficient (r).

The observed difference and association were considered as follows:

- $p<0.05$ was considered non-significant (NS)
- $p\leq0.05$ was considered significant (S).
- $p\leq0.001$ was considered highly significant (HS).

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Results

Table (1): Number and percentage distribution of demographic characteristics for studied mothers (n=197):

Mothers Demographic Characteristics	No	%
Age:		
20- <30	51	25.9
30-<40	121	61.4
40-<50	20	10.2
≥ 50	5	2.5
Mean ± SD	33.66±5.33	
Mothers' Educational Level:		
Can't read and write	51	25.9
Read and write	90	45.7
Basic education	29	14.7
Secondary education	17	8.6
University education	10	5.1
Marital Status:		
Married	149	75.6
Divorce	28	14.2
Widow	20	10.2
Occupation:		
Housewife	106	53.8
Employed	91	46.2
Monthly income:		
Insufficient	73	37.1
Sufficient	88	44.7
Sufficient and save	36	18.3
Number of family members:		
1-<3	57	28.9
3-<5	58	29.4
≥ 5	82	41.6

Table (1) shows that 61.4% of the studied mothers were in the age group 30-<40 years old with a mean age33.66±5.33. Also, 45.7% of them read and write and 75.6% of them were married. As well as, 53.8%, of them were housewives, while 46.2% of them were employed. Moreover, 44.7% of them had sufficient monthly income. Additionally, 41.6% of them had family members ≥ 5.

Table (2): Number and percentage distribution of studied children's demographic characteristics (n=197).

Child demographic characteristics	No.	%
Age of the child (years):		
2- < 5	110	55.8
5-< 8	67	34
8-<12	10	5.1
12-<15	10	5.1
Sex :		
Male	197	100
Level of education		
Can't read and write	120	60.9
Primary	67	34

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Preparatory education	10	5.1
Ranking the child among their sibling:		
First	82	41.6
Second	66	33.5
Third	37	18.8
Fourth and more	12	6.1

Table (2): demonstrates that 55.8% of the studied children were in the 2- < 5 age group and 100% of them were male. Additionally, 60.9% of them can't read and write. As regards the child's rank, 41.6% of them were the first rank among sibling.

Table (3): Number and percentage distribution of studied children according to present and past medical history (n=197)

Child's Current Medical History	No.	%
Age when favism appears:		
2-<4 years	110	55.8
4-<6 years	67	34
≥ 6	20	10.2
Duration of the child's illness :		
< 3 years	120	60.9
3-< 6 years	67	34
≥ 6	10	5.1
Hemoglobin level in the blood for the child with favism :		
< 8	10	5.1
8-< 10	58	29.4
10-12	129	65.5
Treatment which child was taken:		
Blood transfusion	130	66
Medicine	40	20.3
Blood transfusion and medicine	27	13.7
In the case of treatment by medication, the type of medication		
Folic acid	150	76.1
Chemical drug	17	8.63
Vitamin C	40	20.3
Did the child have Complications?		
Yes	120	60.9
No	77	39.1
In case of yes, types of complication		
Severe Anemia	120	60.9
Acute kidney injury	30	15.2
Susceptibility to infection	47	23.9
Symptoms appear		
Pallor in the skin	27	13.7
Difficulty in breathing	50	25.4
Fever	80	40.61
Gastroenteritis	40	20.3
Past medical history		
Children affected with chronic disease		
Kidney problems	30	15.2
Non	176	84.8

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kinship between the parents		
Yes	47	23.9
No	150	76.1
In case of yes, Type of kinship		
Cousins or aunts. From (Father)	25	53.2
Cousins or aunts. From (mother).	12	25.5
Indirect kinship	10	21.3
Family history of favism		
Yes	47	23.9
No	150	76.1
In case of yes, whom?		
Children of uncles and aunts	10	21.3
Siblings	37	78.7

Table (3): Shows that, 55.8% of the studied children, favism appears in age group 2-<4 years and 60.9% of them, the duration of illness was < 3 years. In addition, 65.5%, 66%, and 76.1% of them their hemoglobin level was 10-12, treated with blood transfusion, and with folic acids respectively. 60.9% of them had severe anemia as a complication. Moreover, 25.4% and 40.6% of them had a fever and difficulty in breathing as regards symptoms appeared respectively. Regarding past medical history, 84.8% of them hadn't chronic disease, and 76.1% didn't have kinship between the parents. Also, 76.1% of them hadn’t a family history of favism.

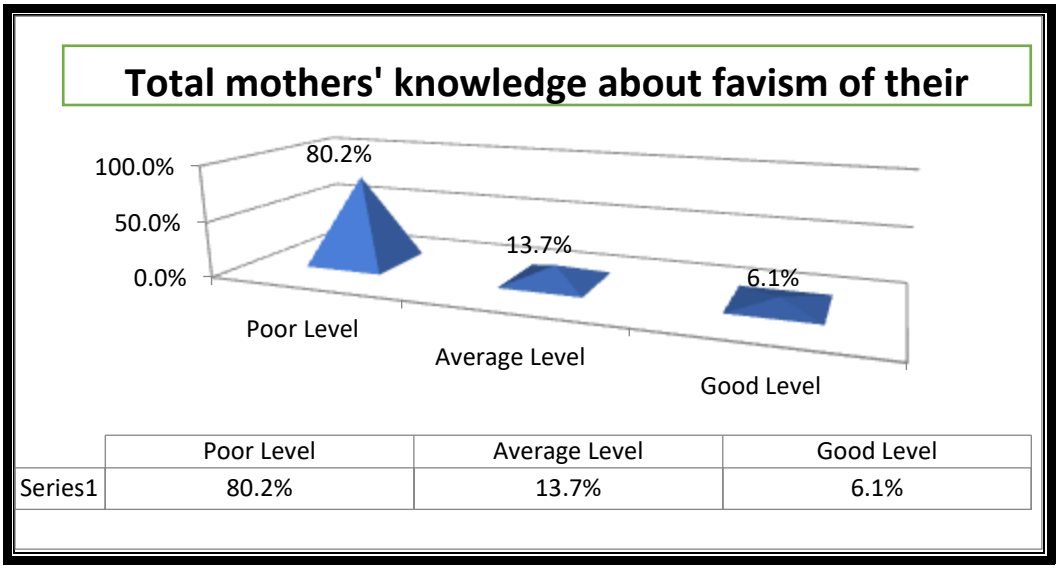

Figure (1): Percentage Distribution of Total knowledge of studied mothers about Favism (n=197).

Figure (1) Illustrates that, 80.2% of studied mothers had a poor level of total knowledge about favism, while 13.7% and 6.1 of them had average and good levels of knowledge about favism respectively.

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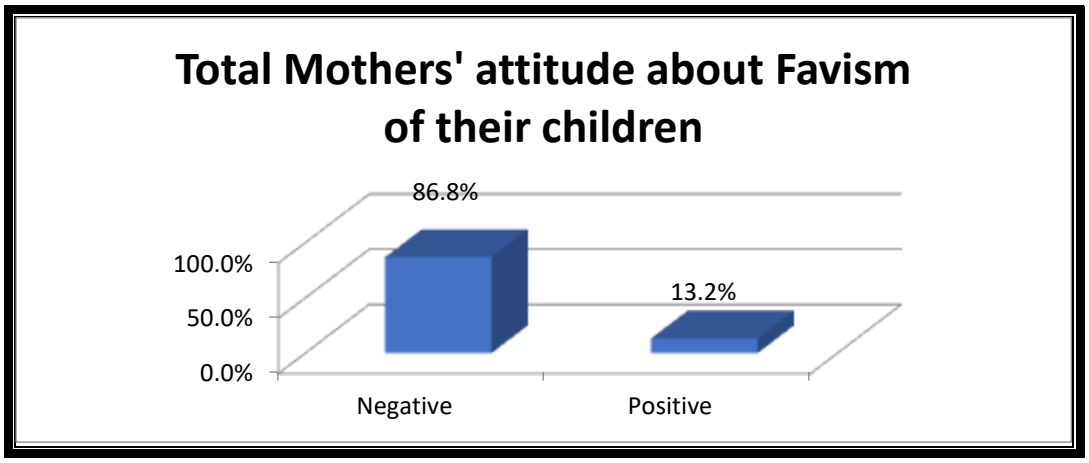

Figure (2): Percentage Distribution of studied Mothers' attitudes about favism of their child (n=197)

Figure (2) Shows that 86.8% of studied mothers' had a negative attitude about favism, While 13.2% of them had a positive attitude about favism of their children

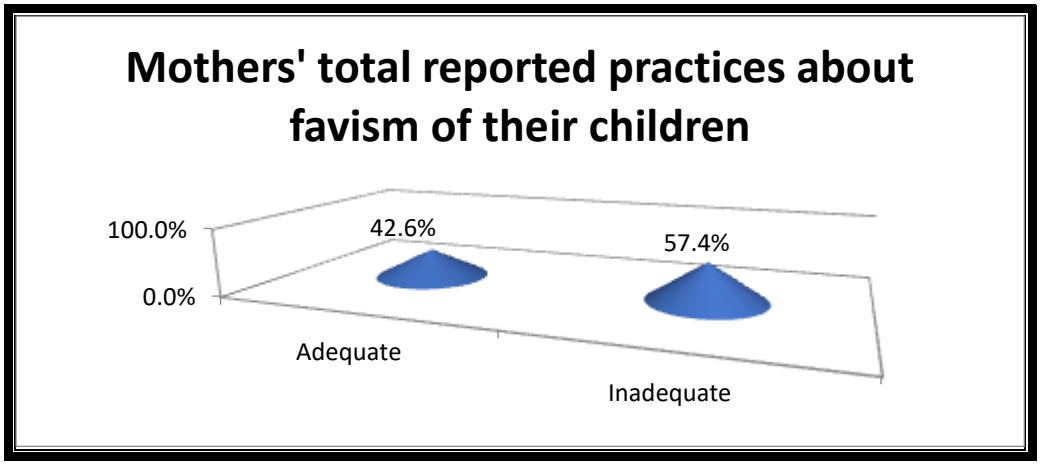

Figure (3): Percentage Distribution of studied mothers' total reported practices about favism of their children (n=197)

Figure (3): Illustrates that, 42.6% and 57.4% of studied mothers had adequate and inadequate reported practices about favism of their children respectively.

Table (4): Relation between total knowledge about favism and studied mothers' demographic characteristics (n=197).

Demographic characteristics	Total knowledge level among the studied sample						χ^2	P
	poor level (n=158)		Average level (n=27)		Good level (n=12)			
	No.	%	No.	%	No.	%		
Age								
20: <-30	41	80.4	6	11.8	4	7.8	28.11	0.00*
30<-40	95	78.5	18	14.9	8	6.6		
40: <-50	17	85	3	15	0	0		
≥ 50	5	100	0	0	0	0		

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level of education								
Can't read and write	34	66.7	8	15.7	9	17.6	24.86	0.002*
Read and write	79	87.8	9	10	2	2.2		
Basic education	21	72.4	8	27.6	0	0		
Secondary education	16	94.1	1	5.9	0	0		
University education	8	80	1	10	1	10		
Marital status								
Married	120	80.5	19	12.8	10	6.7	0.912	0.923
Divorce	22	78.6	5	17.9	1	3.6		
Widow	16	80	3	15	1	5		
Occupation								
House wife	86	81.1	11	10.4	9	8.5	4.04	0.132
Employee	72	79.1	16	17.6	3	3.3		
Place of residence								
Urban	63	84	8	10.7	4	5.3	1.148	0.563
Rural	95	77.9	19	15.6	8	6.6		
Monthly income								
Insufficient	58	79.5	9	12.3	6	8.2	2.17	0.704
Sufficient	73	83	11	12.5	4	4.5		
Sufficient and save	27	25	7	19.4	2	5.6		
Number of family members								
3-<5	45	78.9	8	14	4	7	2.26	0.688
5-<8	47	81	6	10.3	5	8.6		
≥8	66	80.5	13	15.9	3	3.7		

* P-value ≤ 0.05 Significant

Table (4): Displays that, there is a statistically significant relation between total knowledge about favism and mothers' age and educational level. While, there are no statistical relations between total mothers' knowledge and marital status, occupation, place of residence, monthly income and number of family members.

Table (5): Relation between total attitude about favism and mother-studied demographic characteristics (n=197)

Demographic characteristics	Total attitude				χ^2	P
	Negative (171)		Positive (26)			
	No.	%	No.	%		
Age						
20: <30	43	84.3	8	15.7	22.19	0.000*
30<-40	112	92.6	9	7.4		
40: < -50	11	55	9	45		
≥ 50	5	100	0	0		
level of education						
Can't read and write	45	88.2	6	11.8	1.42	0.841
Read and write	76	84.4	14	15.6		
Basic education	25	86.2	4	13.8		

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Secondary education	16	94.1	1	5.9		
University education	9	90	1	10		
Marital status						
Married	136	91.3	13	8.7	10.93	0.004*
Divorce	21	75	7	25		
Widow	14	70	6	30		
Occupation						
Housewife	96	90.6	10	9.4	2.83	0.04*
Employee	75	82.4	16	17.6		
Place of residence						
Urban	106	86.9	16	13.1	0.002	0.965
Countryside	65	86.7	10	13.3		
Monthly income						
Insufficient	64	87.7	9	12.3	1.35	0.508
Sufficient	74	84.1	14	15.9		
Sufficient and save	33	91.7	3	8.3		
Number of family members						
3-<5	44	77.2	13	22.8	6.50	0.003*
5-<8	53	91.4	5	8.6		
≥8	74	90.2	8	9.8		

* P-value ≤ 0.05 Significant

Table (5): shows that there is a statistically significant relationship between total attitude about favism and mothers' age, sex, marital status and occupation while, there is no statistical relation between mothers' attitude, level of education, monthly income and family members.

Table (6): Relation between total reported practices about favism and demographic Characteristics of studied mothers (n=197).

Demographic characteristics	Total reported practice				χ^2	P
	Adequate (15)		Inadequate (182)			
	No.	%	No.	%		
Age						
20: <-30	4	7.8	47	92.2	2.43	0.486
30<-40	11	9.1	110	90.9		
40: <-50	0	0	20	100		
≥ 50	0	0	5	100		
level of education						
Can't read and write	6	11.8	45	88.2	5.394	0.249
Read and write	5	5.6	85	94.4		
Basic education	2	6.9	27	93.1		
Secondary education	0	0	17	100		
University education	2	20	8	80		
Marital status						
Married	11	7.4	138	92.6	0.588	0.745
Divorce	3	10.7	25	89.3		
Widow	1	5	19	95		
Occupation						
Housewife	8	7.5	98	92.5	0.001	0.969

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Employee	7	7.7	84	92.3		
Place of residence						
Urban	11	9	111	91	0.896	0.344
Rural	4	5.3	71	94.7		
Monthly income						
Insufficient	5	6.8	68	93.2	0.102	0.950
Sufficient	7	8	81	92		
Enough and save	3	8.3	33	91.7		
Number of family members						
✓ 3-<5	7	12.3	50	87.7	3.20	0.201
✓ 5-<8	2	3.4	56	96.6		
✓ ≥ 8	6	7.3	76	92.7		

Table (6): illustrates that, there is no statistical relation between mothers' reported practice and their age, level of education, marital status, occupation, place of residence, monthly income, and number of family members.

Table (7): Correlation between total knowledge, reported practices and total attitudes of studied mothers about favism (n=197).

Variables	Total knowledge, Total reported practices and Total attitude					
	Total knowledge		Total reported practices		Total attitude	
	R	P	R	P	R	p
Total knowledge	-----	----	0.668	0.031*	0.917	0.007*
Total reported Practices	0.668	0.031*	----	-----	0.832	0.015*
Total attitude	0.917	0.007*	0.832	0.015*	----	---

*Significant (P<0.05) r= Pearson Correlation Coefficient

Table (10): shows that there is a statistically significant positive correlation between total knowledge, total reported practices, and total attitude in P-values =<0.05

DISCUSSION

Favism is a more life-threatening illness in children. It is the common type of acute hemolytic anemia, especially among children that results from the ingestion of fava beans and is associated with glucose-6-phosphate dehydrogenase) G6PD (deficiency. It is the most common form of G6PD deficiency (Ravikumar & Greenfield, 2020).

Mothers' perception of children with favism likely experience a range of emotions, including concern, protectiveness, and potentially some anxiety due to knowledge gaps. Education and support can be crucial in helping them manage their child's condition effectively (Mahmoud et al., 2023). Mothers develop a keen eye for detail, scrutinizing food labels and becoming food detectives in their kitchens. This unwavering commitment reflects unwavering love and their belief in the ability to keep their child safe (El-Bastwese et al. 2020). Therefore, this study aimed to assess mothers' perceptions of their children suffering from favism

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Part I: Demographic characteristics of the study sample:

As regards the demographic characteristics of mothers, the present study revealed that more than three-fifths of the studied mothers were in the age group 30-<40 years old with a mean age33.66±5.33, more than two-fifths of them can read and write and more than three-quarters of them were married.

This finding was consistent with Shash et al., (2023) conducted a study about" Parents' Awareness and Knowledge of G6PD Deficiency" in Saudi Arabia, (n= 260), and found that 61.9% of their participants were <40 years old. 63.4% of them had a bachelor's level of education and 88.5% of them were married.

In addition, the present study result was incongruent with the findings of Alqahtani (2022), who conducted a study on the "Saudi mothers' attitude, knowledge, and practice towards glucose six phosphate dehydrogenase deficiency, (n=230) and found that the age of studied mothers was between 41-50 years, and 76.9% of them had a university level of education or above.

This might be due to the age of childbearing range (typically 15-45 years old). This could be due to social factors, or personal preferences, which explained the higher proportion of mothers in the 30–40 year age group. In addition, the cultural attitudes towards female education might have played a role in the past, potentially limiting educational opportunities for some mothers.

The current study showed that more than half of the studied mothers were housewives. Moreover, more than two-fifths of them had sufficient monthly income. Regarding family members, the present study showed that more than two-fifths of them had family members ≥ 5. As regards residence, the current study mentioned that more than three-fifths of them were from urban while more than one-third of them were from rural areas.

These findings were supported by Tarhani et al. (2021) whose study entitled" Clinical Manifestations and Therapeutic Findings of the Children with Glucose-6-Phosphate Dehydrogenase Deficiency Mothers' Perception about Favism" in Iran (n=150) and found that 57% of studied participants were housewives, and 43% of them had sufficient monthly income, 44.8% of the mothers had family members ≥ 5 and 36.8% of them were from rural areas.

Concerning the children's demographic characteristics, the present study revealed that more than half of the studied children were in the 2- < 5 years. In the same line this finding was with Mahmoud & Abdeldaiem, (2022), who conducted a study about the "relationship between mothers' ingestion of fava beans and occurrence of favism attack among their children" in Egypt, (n=50) who found study found that 53.4% of infants were between 2 <5 years.

This might be due to the age range of 2-5 years reflecting the peak period when these symptoms might become noticeable and prompt parents to seek medical attention. Additionally, parents of younger children might be more attentive to dietary habits and more likely to notice any adverse reactions that could be linked to favism.

Concerning sex, the current study revealed that all of the children were males. As regards the child's rank, the current study mentioned that more than two-fifths were in first-order between siblings.

This finding was in the same line with Armishty (2023), whose studied entitled "Glucose-6-Phosphate Dehydrogenase Deficiency among Children", in Iraq (n=112) who clarified that 98.2% of children were males. Also, these findings agreed with Albagshi et al., (2020) conducted a study titled" Prevalence of Glucose-6-Phosphate Dehydrogenase Deficiency Among Children" in Saudi Arabia (n=140) reported that 99.4% of children were males.

This might be due to X-linked inheritance; expressed as G6PD deficiency, which causes favism, and is an X-linked genetic condition. This means the gene responsible for the enzyme is located on the X chromosome. Males have only one X chromosome, while females have two. This makes females less likely to experience the full effects of G6PD deficiency and favism symptoms.

Regarding the child's current medical history, the present study found that more than half and more than three-fifths of the studied children were in the age group 2-<4 years when favism appeared, and the duration of illness was< 3 years respectively. In addition, nearly two-thirds, of them their hemoglobin level was 10-12, and treated with blood transfusion respectively.

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This finding was supported by El-Bastwese et al., (2020) whose study entitled" The effect of health education program for mothers and their children diagnosed with favism, in Damietta, Egypt, (n=72) who found that 60.1% of studied children had a disease duration of 1-3 years. Conversely, these findings disagreed with Armishty (2023), who found that 34.8% of children their the disease appeared when the age ≥ 6 years and level of hemoglobin less than 8.

This might be due to the prevalence of anemia as a symptom and the potential severity of favism in some children, requiring interventions like blood transfusions and treatment for complications.

As well as the present study found that more than three-fifths of studied children had severe anemia as a complication. Moreover, two-fifths of them had fever as a symptom. These results were contradicted by Armishty (2023), who clarified that pallor was the most prevalent clinical symptom of jaundice was present in most, abdominal pain was present in 50.6% of cases, and fever in 24.8% of cases.

From the researcher's point of view, fever can be an indicator of an underlying infection or inflammation, which may exacerbate the effects of anemia. While shortage of breath, pallor, and loss of appetite were more in children at this age. So, these findings underscore the importance of early detection, education, and management of G6PD deficiency to prevent severe complications.

Regarding past medical history, the majority of studied children hadn't chronic disease, and more than three-quarters didn't have kinship between the parents. Also, more than three-quarters of them hadn't a family history of favism.

This finding was in a similar line to the study of Kasemy et al. (2020) about "Mothers' knowledge, attitude and practice towards glucose-6-phosphate dehydrogenase deficiency among children" in Egypt (n=487) and who found that 85.4% of studied children had other chronic diseases, 74.2% of them hadn't kindship between the parents and 69.4% of them hadn't family history of favism.

These findings were incongruent with Mahmoud & Abdeldaiem, (2022) who reported that 82% of them had a family history of G6PD deficiency and the majority of children don't have other chronic diseases.

From investigators' point of view, regular investigation, and genetic testing in those affected children with G6PD deficiency needs to be made routinely within the health system, and educating all mothers who had infants with favism or family history to prevent eating fava beans to prevent agitation of favism crisis in their infants.

Regarding blood transfusion, the current study illustrated that more than half of the studied children take blood transfusions once a month while less than one-third of them take blood transfusions twice a month.

This finding was supported by Elalfy et al., (2022), who studied titled about "Management of children with glucose-6-phosphate dehydrogenase deficiency ", in Egypt, (n=308) and mentioned that 51.8% of children take blood transfusion once every month while 29.8% of them take blood transfusion twice every month.

While, this finding was contradicted by Tarhani et al., (2021) mentioned that there is no set limit to the number of blood transfusions a child can have, also, found that less than half of cases took blood transfusion because it was necessary for them.

This might highlight the need for more restrictive transfusion strategies in clinically stable cases as long as there is adherence to follow-up. Additionally, severe anemia can significantly reduce the body's oxygen-carrying capacity, leading to fatigue, shortness of breath, and other complications. Furthermore, regularly scheduled blood transfusions might be necessary to replenish red blood cells and alleviate these symptoms. Children might respond differently to treatment for favism-induced anemia. Some might require more frequent transfusions to achieve and maintain the desired hemoglobin levels compared to others.

Part II: Mothers' knowledge regarding favism:

Concerning total mothers' knowledge level about favism, the present study found that more than four-fifths of studied mothers had poor level of total knowledge while, the minority of them had fair knowledge. This finding was consistent with Al Blewi et al (2023), who mentioned that 80.7% of studied parents had poor level of knowledge regarding Glucose-6-Phosphate Dehydrogenase (G6PD) deficiency and 19.3% of them had fair level of knowledge about G6PD deficiency.

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This might be due to studied mothers needing educational programs about favism, its causes, symptoms, management, and prevention. In addition, limited access to health care facilities that provide information about favism.

Part III: Mothers' Attitude regarding favism:

Regarding the total mothers' attitudes about favism, the current study showed that more than four-fifths of the studied mothers had negative attitude level about favism, while a minority of them had a positive total attitude level.

This finding was consistent with Alsultan et al., (2023) whose study titled "Knowledge, Attitude, and Practice toward Glucose-6-Phosphate Dehydrogenase Deficiency among Mothers" in Saudi Arabi (n=210), and found that 78% of studied mothers had negative attitudes and 22% of them had positive attitudes.

This might be due to cultural beliefs and stigmas, expressed as cultural perceptions and stigmas surrounding genetic disorders like G6PD deficiency can influence practices. Moreover, this might be due to financial strain due to medical care, dietary adjustments, and potential loss of income if the child requires constant care can contribute to negative attitudes.

Part IV: Mothers 'reported practices regarding favism:

Concerning mothers' total reported Concerning mothers' total reported practices about favism, the present study illustrated that more than two-fifths of mothers had adequate reported practice level, while more than half of studied mothers had inadequate reported practices about favism.

This finding was incongruent with Alsultan et al., (2023) found that 38.9% of studied mothers had adequate level of reported practices level and 61.1% of them had inadequate reported practices level. This might be due to mothers adhering to traditional practices that are not evidence-based or may not align with recommended guidelines for favism care. Also, lack of access to educational resources can hinder mothers from adopting appropriate practices.

Part IV: Relations and Correlations among Variables:

Relation between total mothers' knowledge about favism and their demographic characteristics, the current study revealed that there was a statistically significant relation between total knowledge and mothers' age educational level.

This finding was similar to Alqahtani (2022), which revealed that there was a statistically significant relation between total knowledge and mothers' educational levels, and their age.

This might be due to mothers with higher education being more likely to comprehend explanations about favism, its inheritance patterns, and preventive measures. The findings highlighted the potential role of education in empowering mothers to learn about children's health conditions. While the connection to favism itself might seem indirect, it suggested a need for effective ways to communicate complex medical information to families with varying educational backgrounds.

Regarding the relation between mothers' attitude and their demographic characteristics, the current study showed a statistically significant relation between mothers' attitude and age, marital status, occupation, and family members.

These findings were supported by Alsultan et al., (2023) who found that statistically significant relation between mothers' attitudes with age, marital status, and occupation. This might be due to the mother's age which influences her priorities, values, and experiences. Also, married mothers may have more social support and resources compared to single mothers, potentially leading to differences in attitudes toward parenting stress or child development. In addition, mothers in demanding careers might have different attitudes towards work-life balance compared to stay-at-home moms. Furthermore, mothers with a larger family might have different attitudes towards discipline or time management compared to those with only one child.

Concerning the relation between mothers' reported practice and their demographic characteristics, the present study revealed that no statistical relation between mothers' reported practices and age, level of education, marital status, occupation, place of residence, and monthly income.

This finding was agreed with Al Abedi et al., (2023) and reported that there was a significant relationship between mothers' practices and mothers' age, occupation, and level of education.

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This might be due to mothers had the ability to understand and follow medical advice from doctors about managing favism. Also, managing multiple children could make it harder to consistently follow all favism practices (e.g., ensuring all foods are safe).

Correlation between knowledge reported practices, and attitudes of mothers toward their children suffering from favism:

The present study revealed that there was a positive correlation between mothers' knowledge, attitude and reported practices.

These findings were supported by El-Bastwese et al., (2020) who presented a positive correlation between total knowledge and total attitude for mothers and their children diagnosed with favism (r=0.373). In addition, there was a positive correlation between total knowledge and total reported practice (r=0.420).

Concoulsion

In light of the results of the current study and research questions, it was concluded that; the majority of studied mothers had poor level of total knowledge and negative attitude about favism, while, more than half of them had inadequate reported practices about favism. Moreover, there was a statistically significant relation between total knowledge about favism and mothers' age and educational level. Furthermore, there was a statistically significant relation between total attitude about favism and mothers' age, marital status, occupation. Additionally, there was no statistical relation between mothers' reported practice and their age, level of education, marital status, occupation, place of residence, monthly income, and number of family members for their children suffering from favism. Finally, there was a statistically significant positive correlation between total knowledge, total reported practices and total attitude of the studied mothers regarding favism.

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Recommendation:

In light of the findings of the current study, the following recommendations can be suggested:

- Developing an educational program to increase mothers' awareness about favism.
- Disseminate booklets and poster to increase mothers' knowledge, and practices about favism of their children.
- Further research on a large sample and other settings is needed.

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