

KNOWLEDGE, ATTITUDE AND PRACTICE OF MOTHERS ABOUT G6PD
DEFICIENCY ANEMIA AT WELFARE CHILDREN TEACHING HOSPITAL IN
BAGHDAD 2025

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ABSTRACT

Background: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the most common inherited enzymatic disorder, caused by mutations of the X-linked gene glucose-6-phosphate dehydrogenase (G6PD). This disease makes red blood cells highly vulnerable to oxidative damage and therefore susceptible to hemolysis. In people with Glucose-6-phosphate dehydrogenase deficiency, infections, specific drugs and specific foods are the three main causes of hemolytic anemia. Glucose-6-phosphate dehydrogenase deficient persons are usually asymptomatic, but serious clinical signs, such as acute hemolytic anemia, jaundice and congenital non-spherocytic hemolytic anemia, can be seen in patients with Glucose-6-phosphate dehydrogenase deficiency. **Subjects and methods:** A descriptive cross-sectional study was conducted in general consultant clinic at welfare children teaching hospital, Baghdad city, from 1st of February till 15th of July, 250 participants were selected and asked the questions which were included in the KAP questionnaire which is consisted of four parts (sociodemographic which contains 7 questions, knowledge part contains 3 subdivisions which are general knowledge contains 5 questions, risk factors contain 7 questions and clinical manifestations contain 7 questions, the attitude part contains 7 questions and practice part contains 6 questions) data analysed and processed using SPSS version 26. **Results:** Total study group were 250 participants, the highest proportion were within the age 16-30 years old, (8.8%) reported having an affected child, and (28.8%) reported a positive family history. Knowledge levels were fair in 54.4% of participants, good in 36.8%, and poor in 8.8%. Attitudes were neutral in 44.8%, positive in 42.8%, and negative in 12.4%. Practices were fair in 54.0%, good in 36.0%, and poor in 10.0%. Higher education, governmental employment, and having an affected child were significantly associated with better knowledge. Similarly, educational level and occupation were significantly associated with maternal attitudes. Maternal practices were significantly influenced by age, education, occupation, and family history of G6PD deficiency. **Conclusion:** The study revealed widespread awareness of G6PD deficiency anemia among mothers, with varying levels of knowledge: one third had good knowledge, while over half had fair knowledge. There were gaps and misconceptions about inheritance, triggers, and complications. Attitudes were primarily neutral or positive, with nearly half of the respondents exhibiting a positive outlook on the condition and its management. Fair practices were reported by more than half of the respondents, while about one third had good practices. Higher education and employment correlated with better knowledge, attitudes, and practices, while a lack of family history was linked to better practices, and having an affected child was associated with higher knowledge levels.

INTRODUCTION

Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the most common inherited metabolic abnormality of red blood cells (RBCs), affecting 400 million individuals worldwide. This disorder frequently causes jaundice in newborns, which can lead to consequences like cerebral

palsy, kernicterus, or even death. Serious clinical signs, such as acute hemolytic anemia, jaundice, and congenital non-spherocytic hemolytic anemia, can be seen in patients with G6PD deficiency.^[1]

G6pd deficiency is rate-limiting enzyme in the pentose phosphate pathway and is essential for preventing oxidative damage to red cells, therefore red cells lacking G6PD are susceptible to oxidant induced haemolysis.^[2]

It is X-linked disorder caused by a mutation or change in the G6PD gene, which is found near the distal end of the X chromosome's long arm. Males are more likely to have the illness because it is X-linked, however the more prevalent genotype is really heterozygous females. Males are more likely to express the genetic mutation since heterozygous females are unlikely to experience full-blown insufficiency because of favorable X-chromosome inactivation. Female homozygous genotypes are incredibly uncommon.^[3]

G6PD-deficient persons are mostly asymptomatic, but they can develop severe jaundice during the neonatal period and acute hemolytic anemia when they ingest fava beans or when they are exposed to certain infections or drugs.^[4] Typically haemolysis ensues in about 24-96 hours after a patient has ingested a substance with oxidant properties; in severe cases jaundice and haemoglobinuria result and haemoglobin (Hb) concentration fall precipitously.^[5]

The parents should be given advice about the signs of haemolysis (jaundice, pallor and dark urine) and provided with a list of drugs, chemicals and food to avoid, so the prevention of haemolysis constitute the most important therapeutic measure.^{[2][5]}

A comprehensive health education program on this disease is required to guarantee improved early detection, timely treatment, and better avoidance of triggering events.^[6]

Having a better insight to mothers' knowledge, attitude and practice can assist in developing educational interventions about G6PD to correct misconceptions and ensure that triggering factors are avoided.^[7]

This study aim to: Asses knowledge, attitude and practice of mothers about G6PD deficiency anemia at children welfare teaching hospital, and demonstrate knowledge, attitude and practice of mothers association with socio-demographic data.

METHODOLOGY

Study setting and design

This descriptive cross-sectional study with some analytic measurements was conducted in a sample of mothers who were attending general consultation clinic at children welfare teaching hospital. The study was carried out during period from 1st February till 15th of July 2025.

Inclusion criteria

All mothers who volunteered to give informations about their knowledge, attitude and practice towards G6PD deficiency anemia who's aged 16 and older and who

attend general consultation clinic at children welfare teaching hospital.

Exclusion criteria

- Mothers who refused to participate.
- Mothers with cognitive impairment.

Data collection method

Data was collected by direct interviews using a written structured questionnaire by the researcher with supervisor opinion and recommendation and reviewed by two doctors of family medicine specialist and translated to the Arabic language by the researcher.

The questionnaire sections and questions were adopted from previous^{[8][9][7][10]} studies and modified according to the research needs and the intended category of this research.

The structured questionnaire consisted of four parts.

1. First part contains 7 questions about sociodemographic features and about having a child or having a family history of G6PD deficiency anemia.
 - Residant.
 - Age.
 - Marital status.
 - Educational level.
 - Occupation.
 - Having a child with glucose-6 phosphate dehydrogenase deficiency anemia (favism).
 - Having a family history of glucose -6 phosphate dehydrogenase deficiency anemia (favism).
2. The Second part contains three subdivisions which are general knowledge contains 5 questions, risk factors contain 7 questions and clinical presentation contain 7 questions, assessing mothers knowledge towards G6PD deficiency anemia.
3. The third part contains 7 questions about mother's attitude towards G6PD deficiency anemia.
4. The forth part contains 6 questions about mothers practice towards G6PD deficiency anemia.

*reversed questions.

- In knowledge: Q3, Q6, Q9

- In mother's attitude: Q3

Ethical considerations and official approval

An approval from scientific council of Arabic board of health specialization to collect data was obtained from administrative department of the hospital. All the participants had been informed about the aim of the study, official agreement was obtained, a written consent was obtained from all of them, and a complete confidentiality was ensured.

Statistical Analysis

The data was entered, coded and analyzed using Microsoft Excel and International Business Machine (IBM) Statistical Package for the Social Science (SPSS)

international statistics version 26. Continuous variables were expressed as means and standard deviations. Categorical variables were expressed as frequency and percentages. The Welch's t-test (for normally distributed variables) was used to test the differences in means. The difference between categorical variables was investigated using either the χ^2 test with Yates' correction or Fisher's

exact test, depending on the context. A P-value less than 0.05 was considered statistically significant.

Scoring of the questionnaire was done as shown in table 1.

Table (1): Categorization of the knowledge, attitude and practice(KAP) score.

Domain	Category	Score Range	Percentage Range
Knowledge (0-38 score range)	Poor Knowledge	0 – 18	Less than 50%
	Fair Knowledge	19 – 28	50% to 75%
	Good Knowledge	29 – 38	Greater than 75%
Attitude (0-14 score range)	Negative Attitude	0 – 6	0% – 42.9%
	Neutral Attitude	7 – 10	>42.9% – 71.4%
	Positive Attitude	11 – 14	>71.4% – 100%
Practice (0-12 score range)	Poor Practice	0 – 5	0% – 41.7%
	Fair Practice	6 – 9	>41.7% – 75%
	Good Practice	10 – 12	>75% – 100%

RESULTS

Table 2 presents the sociodemographic characteristics of 250 mothers. It shows that 41.2% were aged 16-30, the

majority (79.6%) lived in urban areas, and 42.0% held a university degree or higher. Additionally, 90.4% were married, and 60.4% were housewives.

Table (2): Sociodemographic characteristics of the participating mothers.

Sociodemographic characteristics	n (%)
Age categories	
16-30	103 (41.2)
31-40	82 (32.8)
41-50	40 (16.0)
>50	25 (10.0)
Residence	
Urban	199 (79.6)
Rural	51 (20.4)
Educational attainment	
Illiterate	16 (6.4)
Primary school	65 (26.0)
Secondary school	64 (25.6)
University degree and above	105 (42.0)
Marital status	
Married	226 (90.4)
Divorced/widow	24 (9.6)
Occupation	
Housewife	151 (60.4)
Governmental employee	96 (38.4)
Non-governmental employee	2 (0.8)
Retired	1 (0.4)
Total	250 (100%)

All 250 mothers surveyed were aware of G6PD deficiency anemia (favism). Among them, 8.8% had a child diagnosed with the condition, while 91.2% did not. Additionally, 28.8% reported a positive family history of

G6PD deficiency, while 71.2% indicated no such history. (**Table 3**)

Table (3): Awareness and family history of glucose-6-phosphate dehydrogenase (G6PD) deficiency among participants.

Characteristics	n (%)
Have you ever heard of G6PD deficiency anemia (favism)?	
Yes	250 (100.0)
Have a child with G6PD deficiency anemia	
No	228 (91.2)
Yes	22 (8.8)
Positive family history of G6PD deficiency anemia	
No	178 (71.2)
Yes	72 (28.8)
Total	250 (100%)

Table 4 In a study of 250 mothers' understanding of G6PD deficiency, 80.8% recognized it as a blood disease, and 95.2% identified fava beans as a trigger. 64.0% acknowledged it as genetic, and 53.2% noted that infections could trigger attacks. Commonly recognized symptoms included pallor (74.8%), dizziness (61.6%),

and shortness of breath (56.0%). However, knowledge about naphthalene (29.6%) and the necessity of both parents being carriers (31.2%) was lower. Additionally, 63.2% linked G6PD deficiency with jaundice, and 76.0% understood that symptoms appear after exposure to hemolytic triggers.

Table 4: Distribution of mothers according to their knowledge about G6PD deficiency anemia.

Knowledge questions	Yes n (%)	No n (%)	Don't know n (%)
G6PD deficiency is a blood disease.	202 (80.8)	25 (10.0)	23 (9.2)
G6PD deficiency is a genetic disease.	160 (64.0)	57 (22.8)	33 (13.2)
*Both parents must be carriers of G6PD deficiency to have an affected child.	78 (31.2)	133 (53.2)	39 (15.6)
Inheritance of G6PD deficiency is related to the sex of the child.	85 (34.0)	113 (45.2)	52 (20.8)
Consanguinity is a contributing factor of having G6PD deficiency anemia	149 (59.6)	57 (22.8)	44 (17.6)
*Having a family history of G6PD deficiency should be a condition for having the same disease.	133 (53.2)	74 (29.6)	43 (17.2)
Certain drugs could be a factor causing red blood cells (RBCs) breakdown in G6PD deficiency.	167 (66.8)	42 (16.8)	41 (16.4)
Eating fava beans can trigger an attack of G6PD deficiency.	238 (95.2)	4 (1.6)	8 (3.2)
*G6PD-deficient individuals appear to acquire any illness more frequently than other people.	134 (53.6)	67 (26.8)	49 (19.6)
Infection can trigger an attack of G6PD deficiency anemia.	133 (53.2)	59 (23.6)	58 (23.2)
Using henna products can trigger an attack of G6PD deficiency anemia.	97 (38.8)	61 (24.4)	92 (36.8)
Using naphthalene can trigger an attack of G6PD deficiency anemia.	74 (29.6)	43 (17.2)	133 (53.2)
Pallor is one of the symptoms of G6PD deficiency anemia	187 (74.8)	23 (9.2)	40 (16.0)
Loss of appetite, nausea, diarrhea, and vomiting are complaints of G6PD deficiency anemia.	148 (59.2)	65 (26.0)	37 (14.8)
Dizziness and lightheadedness are symptoms of G6PD deficiency anemia	154 (61.6)	54 (21.6)	42 (16.8)
Shortness of breath is a symptom of G6PD deficiency anemia.	140 (56.0)	65 (26.0)	45 (18.0)
G6PD deficiency anemia is a cause of jaundice.	158 (63.2)	52 (20.8)	40 (16.0)
Dark-colored or red urine is a symptom of G6PD deficiency anemia.	152 (60.8)	30 (12.0)	68 (27.2)
Children usually develop symptoms only when exposed to substances that damage red cells and this cause sudden onset of anemia.	190 (76.0)	29 (11.6)	31 (12.4)

*reverse code

Table 5 The primary sources of information about G6PD deficiency reported by participating mothers included medical staff (40.4%), family members (26.0%), the internet (17.2%), television (8.8%), and friends (7.6%).

Table (5): Sources of information about G6PD deficiency as reported by mothers.

Knowledge source of information	n (%)
Medical staff	101 (40.4)
Family	65 (26.0)
Internet	43 (17.2)
TV	22 (8.8)
Friends	19 (7.6)
Total	250 (100)

A majority of mothers recognized G6PD deficiency anemia as a serious issue (76.8%) and acknowledged consanguineous marriage as a contributing factor (66.0%). However, only 19.6% believed pregnancy should be avoided in families with an affected child, while 60.8% disagreed. Most mothers (64.8%) felt that lifelong monitoring is essential for affected children.

When assessing severity, 37.6% believed the condition could lead to death or disability, while 35.6% disagreed. Additionally, 48.8% thought it might cause spleen enlargement, and 67.6% affirmed the need for medical attention for symptomatic children or those exposed to triggers. **Table 6.**

Table (6): Distribution of mothers according to their attitude toward G6PD deficiency anemia.

Attitude questions	Agree n (%)	Disagree n (%)	Not sure n (%)
Do you think that G6PD deficiency anemia is a serious problem?	192 (76.8)	38 (15.2)	20 (8.0)
Do you think that consanguineous marriage is a contributing factor of having G6PD deficiency anemia?	165 (66.0)	45 (18.0)	40 (16.0)
*Do you think that pregnancy is contraindicated if there is a child with G6PD deficiency anemia in the family?	49 (19.6)	152(60.8)	49 (19.6)
Do you think that a child with G6PD deficiency anemia should be monitored for life?	162 (64.8)	44 (17.6)	44 (17.6)
Do you think that G6PD deficiency anemia can lead to death or handicap?	94 (37.6)	89 (35.6)	67 (26.8)
Do you think that G6PD deficiency anemia can lead to enlargement of the spleen?	122 (48.8)	48 (19.2)	80 (32.0)
Do you think that a child with G6PD deficiency anemia should be treated when they have symptoms or are exposed to trigger factors?	169 (67.6)	52 (20.8)	29 (11.6)

*reversed coded

Among participants, 58% reported they would always seek premarital medical consultation, while 22.8% would do so sometimes, and 19.2% never. For postnatal consultation, 59.6% of mothers reported always consulting, with 25.6% sometimes and 14.8% never. Genetic assessment was sought always by 16.4%, sometimes by 32.4%, and never by 51.2%. Preventive

behaviors showed that 57.2% aimed to limit exposure to triggers, and 64.4% would consult doctors on harmful substances. The highest adherence was in seeking prompt medical advice during symptoms, with 80% always doing so, 17.6% sometimes, and 2.4% never.as documented in **Table 7.**

Table (7): Distribution of mothers according to their practices related to prevention and management of G6PD deficiency.

Practice questions	Always n (%)	Sometimes n (%)	Never n (%)
I would perform a medical premarital consultation.	145 (58.0)	57 (22.8)	48 (19.2)
I would ask for a medical consultation after birth to be sure of child's safety	149 (59.6)	64 (25.6)	37 (14.8)
I would do a genetic assessment if there is a suspicion of G6PD?	41 (16.4)	81 (32.4)	128 (51.2)
I would limit exposure of a child with G6PD deficiency anemia to anything that triggers symptoms.	143 (57.2)	96 (38.4)	11 (4.4)
I would Check with a doctor for instructions and a list of medicines or other things that could be a problem for a child with G6PD deficiency anemia.	161 (64.4)	81 (32.4)	8 (3.2)
I would seek a medical advice instantly if a child develops symptoms of G6PD deficiency anemia.	200 (80.0)	44 (17.6)	6 (2.4)

More than half of the mothers showed fair knowledge (54.4%), with 36.8% achieving good knowledge and 8.8% poor knowledge. Attitude-wise, 44.8% were

neutral, 42.8% positive, and 12.4% negative. In practices, 54.0% displayed fair practices, 36.0% good practices, and 10.0% poor practices.

Table (8): Descriptive statistics and categorical distribution of knowledge, attitude, and practice (KAP) scores among mothers regarding G6PD deficiency.

Characteristic	n (%)
Knowledge Level	
Good	92 (36.8)
Fair	136 (54.4)
Poor	22 (8.8)
Attitude Level	
Positive	107 (42.8)
Neutral	112 (44.8)
Negative	31 (12.4)
Practice Level	
Good	90 (36.0)
Fair	135 (54.0)
Poor	25 (10.0)
Total	250 (100)

Maternal knowledge about G6PD deficiency is significantly linked to educational level, occupation, and having a child diagnosed with the condition. Mothers with university education exhibited the highest knowledge proportion (53.3%), while illiterate mothers showed a low rate (18.8%). Government employees had

better knowledge (57.3%) than housewives (24.5%). Those with a child affected by G6PD deficiency had a higher knowledge rate (63.6%) compared to those without (34.2%). No significant associations were found regarding age, residence, marital status, or family history.

Table (9): Association between sociodemographic variables and maternal knowledge score about G6PD deficiency.

Characteristic	Good, N = 92 ¹		Fair, N = 136 ¹		Poor, N = 22 ¹		P-value ²
	No.	%	No.	%	No.	%	
Age categories							0.5
16-30	37	35.9	58	56.3	8	7.8	
31-40	35	42.7	40	48.8	7	8.5	
41-50	15	37.5	21	52.5	4	10.0	
>50	5	20.0	17	68.0	3	12.0	
Residence							0.10
Urban	79	39.7	105	52.8	15	7.5	
Rural	13	25.5	31	60.8	7	13.7	
Educational level							<0.001
Illiterate	3	18.8	11	68.8	2	12.5	
Primary	16	24.6	43	66.2	6	9.2	
Secondary	17	26.6	40	62.5	7	10.9	
University/above	56	53.3	42	40.0	7	6.7	
Marital status							0.11
Married	84	37.2	125	55.3	17	7.5	
Divorced/widow	8	33.3	11	45.8	5	20.8	
Occupation							<0.001
Housewife	37	24.5	98	64.9	16	10.6	
Governmental employee	55	57.3	35	36.5	6	6.3	
Nongovernmental employee	0	0.0	2	100.0	0	0.0	
Retired	0	0.0	1	100.0	0	0.0	
Have child a with G6PD							0.021
No	78	34.2	128	56.1	22	9.6	
Yes	14	63.6	8	36.4	0	0.0	
Family hx of G6PD							0.10

Characteristic	Good, N = 92 ¹		Fair, N = 136 ¹		Poor, N = 22 ¹		P-value ²
No	65	36.5	93	52.2	20	11.2	
Yes	27	37.5	43	59.7	2	2.8	
² Fisher's exact test; Pearson's Chi-squared test							

Maternal attitudes toward G6PD deficiency were significantly influenced by educational level and occupation, with university-educated mothers (61.9%) and nongovernmental employees (64.6%) demonstrating the most positive attitudes. In contrast, illiterate mothers

and governmental employees exhibited lower positive and higher negative attitudes. Other sociodemographic factors such as age, residence, marital status, and having a child with G6PD showed no significant associations, although family history approached significance.

Table (10): Association between sociodemographic characteristics and maternal attitude score toward G6PD deficiency.

Characteristics	Positive, N = 107 ¹		Neutral, N = 112 ¹		Negative, N = 31 ¹		P-value ²
	No.	%	No.	%	No.	%	
Age categories							0.4
16-30	51	49.5	38	36.9	14	13.6	
31-40	32	39.0	42	51.2	8	9.8	
41-50	13	32.5	22	55.0	5	12.5	
>50	11	44.0	10	40.0	4	16.0	
Residence							0.8
Urban	87	43.7	87	43.7	25	12.6	
Rural	20	39.2	25	49.0	6	11.8	
Educational level							<0.001
Illiterate	3	18.8	10	62.5	3	18.8	
Primary	23	35.4	33	50.8	9	13.8	
Secondary	16	25.0	34	53.1	14	21.9	
University/above	65	61.9	35	33.3	5	4.8	
Marital status							0.8
Married	95	42.0	102	45.1	29	12.8	
Divorced/widow	12	50.0	10	41.7	2	8.3	
Occupation							<0.001
Housewife							
Governmental employee	44	29.1	80	53.0	27	17.9	
Nongovernmental employee	62	64.6	31	32.3	3	3.1	
Retired	1	50.0	1	50.0	0	0.0	
Have child a with G6PD							
No	98	43.0	102	44.7	28	12.3	
Yes	9	40.9	10	45.5	3	13.6	>0.9
Family hx of G6PD							
No	82	46.1	79	44.4	17	9.6	
Yes	25	34.7	33	45.8	14	19.4	0.060
² Pearson's Chi-squared test; Fisher's exact test							

As demonstrated in **Table 11**, maternal practice levels regarding G6PD deficiency significantly correlated with age ($p=0.019$), education ($p<0.001$), occupation ($p<0.001$), and family history ($p=0.002$). Mothers aged 16–30 exhibited the highest good practice rate (43.7%), while those aged 41–50 showed the lowest (17.5%). University-educated mothers had the best practices (62.9%), in contrast to secondary (10.9%) and illiterate mothers (12.5%). Government employees reported better practices (67.7%) compared to housewives (16.6%).

Good practice was more common among those without a family history of G6PD deficiency (40.4%) than those with such a history (25.0%). No significant associations were noted for residence ($p=0.055$), marital status ($p>0.9$), or having a child with G6PD deficiency ($p=0.3$).

Table (11): Association between sociodemographic characteristics and maternal practice score regarding G6PD deficiency.

Characteristic	Good, N = 90 ¹		Fair, N = 135 ¹		Poor, N = 25 ¹		P-value ²
	No.	%	No.	%	No.	%	
Age categories							0.019
16-30	45	43.7	46	44.7	12	11.7	
31-40	33	40.2	42	51.2	7	8.5	
41-50	7	17.5	30	75.0	3	7.5	
>50	5	20.0	17	68.0	3	12.0	
Residence							0.055
Urban	79	39.7	101	50.8	19	9.5	
Rural	11	21.6	34	66.7	6	11.8	
Educational level							<0.001
Illiterate	2	12.5	10	62.5	4	25.0	
Primary	15	23.1	39	60.0	11	16.9	
Secondary	7	10.9	51	79.7	6	9.4	
University/above	66	62.9	35	33.3	4	3.8	
Marital status							>0.9
Married	80	35.4	123	54.4	23	10.2	
Divorced/widow	10	41.7	12	50.0	2	8.3	
Occupation							<0.001
Housewife	25	16.6	104	68.9	22	14.6	
Governmental employee	65	67.7	28	29.2	3	3.1	
Nongovernmental employee	0	0.0	2	100.0	0	0.0	
Retired	0	0.0	1	100.0	0	0.0	
Have child a with G6PD							0.3
No	84	36.8	123	53.9	21	9.2	
Yes	6	27.3	12	54.5	4	18.2	
Family hx of G6PD							0.002
No	72	40.4	95	53.4	11	6.2	
Yes	18	25.0	40	55.6	14	19.4	

²Fisher's exact test; Pearson's Chi-squared test

DISCUSSION

Level of knowledge

Concerning the knowledge score of the study participants about G6PD deficiency, over one-third of mothers demonstrated good knowledge while more than half showed only fair understanding and small minority exhibited poor knowledge. This pattern suggests that while awareness of the disease is widespread, deeper understanding of genetic inheritance, triggers, and complications remains limited. Mothers often recognize the common aspects of the disorder, such as its blood-related nature and triggers like fava beans, but have gaps in knowledge related to inheritance, hidden environmental triggers (e.g., naphthalene, henna), and complications.

This is higher than previous study findings in Iraq, where Abedi NFH et al.^[11], Al-Joborae S^[12], and Muath S et al.^[10] found a fairly low level of awareness of G6PD. In Egypt, knowledge was consistently poorer: Kasemy ZA et al, 2020^[13] reported only 17.1% with good knowledge, while Ragab M et al, 2023^[14] found that more than half of participants had unsatisfactory knowledge, and Fahiem A and Eldin MA 2024^[15] observed 80.2% with poor knowledge. Findings from Saudi Arabia were more

variable. Shash H et al.^[9] reported 53.6% with good knowledge. Collectively, the present study's moderate knowledge level situates it above the consistently poor levels in Egypt and previous studies in Iraq, yet comparable to the more recent Saudi studies that show improving maternal awareness.

Several factors plausibly explain these findings. Like, structural differences across health systems—such as the implementation of national newborn screening programs in Saudi Arabia, but not universally in Egypt or Iraq—may contribute to disparities. Sociocultural influences, including consanguinity rates (noted as high as 50–60% in parts of Saudi Arabia and Iraq), and reliance on family history, may shape knowledge in both positive and negative ways—enhancing disease familiarity but sometimes perpetuating misconceptions.

Association between sociodemographic values and knowledge levels

In this study, maternal knowledge levels were significantly influenced by education, occupation, and having a child with G6PD deficiency. Mothers with higher education were more likely to have good knowledge, government-employed mothers showed

better awareness than housewives, and those with an affected child had higher knowledge levels than those without.

These findings can be explained by differences in health literacy, access to structured health campaigns, and personal caregiving experience. Higher education equips mothers with the ability to access, interpret, and apply health information. Employment, particularly in governmental settings, may provide exposure to workplace-based awareness initiatives, while personal experience with an affected child likely enhances disease-specific knowledge through direct interaction with healthcare providers.

In Jazan at 2022 Hamali HA et al.^[7] likewise found greater odds of good knowledge with higher education, although occupation was not analyzed; by contrast, Alsolamy E et al.^[6] observed no association between education and knowledge, while family history of having an affected child with G6PD deficiency independently predicted higher knowledge again consistent with the recent study. In Egypt, nursing studies on mothers of children with favism found that overall knowledge was significantly associated with several sociodemographic factors, except for place of residence and educational level. Occupational status, however, emerged as a contributing factor, supporting the occupational gradient observed in the present study.^[14]

Level of attitude

In the present study, regarding attitudes toward G6PD deficiency, the majority of mothers demonstrated a neutral stance, followed by less than half with a positive attitude, while only a small proportion expressed a negative attitude. Comparable findings have been reported in Iraq at 2023, where it was noted that most mothers lacked strong proactive attitudes, reflecting reliance on informal sources and a tendency to underestimate the importance of physician guidance.^[11] In Egypt, the overall attitude levels have been less favorable: Kasemy ZA et al, 2020 found that only 45.0% had a positive attitude which was nearly similar to the recent study^[13], while Ragab M. et al.^[14] reported that a considerable similar proportion displayed neutral or passive views toward G6PD management, and Fahiem A and Eldin MA observed that 86.8% of mothers had a negative attitude.^[15]

Naimah A. et al 2023 found 45.0% had a positive attitude resembling the current study.^[16]

This gap indicates that while mothers understand the importance of monitoring and treatment, they may underestimate the severity of acute or long-term complications. Limited exposure to severe cases, lack of detailed education about the clinical spectrum, or health messaging focused primarily on routine care rather than critical outcomes may contribute to this under-recognition.

The differences in attitudes across studies may be explained by several factors. Like, awareness campaigns and health education programs are more robust in Saudi Arabia, particularly through national newborn screening and premarital counseling, fostering more supportive perceptions. In contrast, limited structured education in Egypt and Iraq may contribute to higher rates of neutrality or negativity.

Association between sociodemographic profile and attitude levels

The study revealed a strong association between maternal education and occupation with attitudes toward G6PD deficiency anemia. Higher educational attainment and non governmental employment corresponded with more favorable attitudinal responses.

By contrast, an Iraqi study in Najaf 2023 revealed no significant associations between any sociodemographic variables including education and occupation—and mothers' attitudes toward G6PD deficiency, indicating a divergence from the present findings.^[11] In Egypt, a study conducted in Helwan 2024 found that occupation was significantly linked to maternal attitudes ($p = 0.04$), but educational level was not ($p = 0.841$), partially aligning with the current study's results specifically regarding occupation, but not education.

Level of practice

In the present study, one-third of mothers demonstrated good practice toward the prevention and management of G6PD deficiency, while the majority reported fair practice, and only a small proportion exhibited poor practice. Comparable data from Iraq remain limited; however, Abedi NFH et al. noted that reliance on informal family advice and mass media rather than structured medical guidance translated into suboptimal preventive practices, particularly in avoiding triggers such as fava beans and contraindicated drugs.^[11] In Egypt, studies have consistently shown deficient maternal practices: Kasemy ZA et al. reported that only 19.9% had good practice, while the remainder were either fair or poor.^[13] Similarly, Ragab M et al.^[14] concluded that more than half of participants had unsatisfactory practice levels, and Fahiem A and Eldin MA documented inadequate practice among 57.4% of mothers.^[15] Naimah A et al. in Saudi Arabia reported only 15.8% had a good practice, a much lower percentage compared to current study.^[16]

Association between sociodemographic profile and practice levels

Maternal practice regarding G6PD deficiency was strongly influenced by sociodemographic factors, including age, education, occupation, and family history. Younger and more educated mothers tended to demonstrate better practices, while housewives and less educated groups showed poorer adherence.

In comparison, analogous studies in the region have not consistently demonstrated such demographic associations. In Najaf, Iraq, Abedi NFH et al. found no significant relationships between maternal practice and demographic factors such as age, education, occupation, or family history.^[11] Similarly, Helwan, Egypt Fahiem A and Eldin MA 2024 reported no statistically significant associations between practice levels and sociodemographic characteristics.^[15]

CONCLUSION

The study revealed widespread awareness of G6PD deficiency anemia among mothers, with varying levels of knowledge: one third had good knowledge, while over half had fair knowledge. There were gaps and misconceptions about inheritance, triggers, and complications. Attitudes were primarily neutral or positive, with nearly half of the respondents exhibiting a positive outlook on the condition and its management. Fair practices were reported by more than half of the respondents, while about one third had good practices. Higher education and employment correlated with better knowledge, attitudes, and practices, while a lack of family history was linked to better practices, and having an affected child was associated with higher knowledge levels.

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