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Knowledge, attitude and practice study on immunization among caregivers of children under 5 years

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Abstract

Background: Immunization is a medical intervention that stimulates the development of the body's immune system in humans by using vaccinations. Its purpose is to avoid infectious illnesses. Administering the proper vaccination to the children will substantially reduce the expenses associated with treating diseases and the incidence of diseases, hence improving the overall quality of life for children. So this study aimed to assess the knowledge, attitude, and practices of caregivers regarding immunization under 5 years old in Basra city and determine the factors that influence the attitude and practices of caregivers/mothers towards immunization.

Methods: A cross-sectional study was conducted from November 2023 to April 2024 in three primary health care centers in Basra city. The study aimed to evaluate the knowledge, attitude, and practices of caregivers towards immunization for children under 5 years old. Additionally, the study aimed to identify the factors that influence caregivers/mothers attitudes and practices towards immunization.

Results: The result of this study showed the highest percentage for the socio-demographic factors for mothers, as follows: Mother's age at interval (18 -25) years had (37.7%), (37.3%) with high education level, (68%) house wife mothers, (39.7%) was for multipara mothers with (3-4 children), (60.3%) for mothers with only one child under 5 years old.

Based on knowledge scores about immunization, (91%) of the respondents had excellent knowledge score while (9%) had acceptable knowledge score? The results reveal that 85.7% of the participants strongly agree regarding vaccination is important.

The results of this study indicate that the highest percentage (76%) of mothers have positive attitudes. While the lowest percentage (24%) of the mothers have negative attitudes towards immunization.

The result showed a significant relationship between lack of media exposure and total knowledge score P-value 0.050, also showed significant relationship between mothers with 5-6 children and total attitude score (82.6%) positive attitudes at P. value = 0.016, attitudes and immunization status were associated (P. value = 0.006), with 79% of fully immunized children having mothers with positive attitudes and 21% with negative attitudes. Lack of knowledge regarding the schedule of vaccination (58.3%) was the most common reason for partial immunization and tending to have a negative attitude, but (85.7%) mothers with a lack motivation tends to a positive attitudes about immunization at P. value = 0.025.

Conclusion: This study concluded that the overall knowledge score for participants' mothers and caregivers was 91% with excellent knowledge. Related to attitudes, the mothers have positive attitudes 76%, while 24% of them have negative attitudes towards immunization.

Keywords: Knowledge, caregivers, mothers, immunization, Basra

Introduction

Immunization, or vaccination: is the process of enhancing an individual's defenses to protect against an infectious pathogen, also known as the immunogen., This system will mount an immune response in reaction to molecules that are foreign to the body, an animals or human's body can learn to defend itself by being exposed to an immunogen under regulated conditions. (Calder, 2013) [3].

Immunization represents one of the most affordable health interventions; nonetheless, vaccine reluctance persists, particularly among caregivers who are responsible for protecting their children against vaccine-preventable illnesses. (Galadima *et al.*, 2021) [5].

In 1974, the World Health Organization (WHO) initiated an expanded program on

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immunization (EPI) with the objective of vaccinating children worldwide. This program employs effective tactics, such as outreach services, to guarantee the distribution of vaccines to even the most inaccessible and susceptible populations. The global execution of this program has led to the immunization of over 100 million infants annually, resulting in the preservation of 2-3 million lives each year. (Khatiwada *et al.*, 2021) ^[7].

Vaccine reluctance is influenced by three factors: The environment, people and organizations' knowledge and awareness, and vaccination-related difficulties. (Larson *et al.*, 2014) ^[8].

In addition to other parental variables, mothers' knowledge, attitudes, and practices are crucial in ensuring that children receive all recommended vaccinations before their first birthday. These factors can make the difference between the immunization program's success and failure. (Woreda & Gebreyesus, 2021) ^[17].

Administering the proper vaccination to the children would substantially reduce the expenses associated with disease treatment and the incidence of disease, hence improving the overall quality of life for children. (Rodrigues & Plotkin, 2020) ^[12].

Immunization benefits governments, communities, and societies, as well as individuals and families. Outbreaks of infectious diseases within the same community are less likely to occur if a sufficient number of people have received vaccinations against infectious diseases (World Health Organization, 2022) ^[18].

Aims of study

The goal of the study is to determine the knowledge, attitude, and practice of caregivers toward children immunization under 5 years in Basra Governorate, and to determine the factors that influence on attitude and practices of caregivers /mothers towards immunization.

Materials and Methods

Study period, design and setting

The study was initiated at November 2023 to April 2024, is descriptive cross-sectional study conducted in three primary

health centers in Basra city (Al-Razi health care center, Hayi Al-Muhandisin health care center, Al-Mishraq health care center). After obtained permissions from the public health department in Basra city.

Study sample

This study included 300 samples from caregivers/mothers. By applying a convenience sample that was chosen via a non-probability sampling technique, each center 100 samples, each interview lasted about 10-15 minutes.

Ethical Considerations

Prior to the collection of samples, caregivers were apprised of the study's targets, methodology, and aims. Regarding the study's anonymity, the researcher assured the participants and is dedicated to them. The study is voluntary, and non-personal data has been shared or discussed. All ethical principles were respected, including adherence to moral values, legality, and the protection of secrecy.

Statistical Analysis

The data was imported onto a personal computer and analyzed using the statistical package for social sciences, SPSS-27. The data were presented in frequency and percentage.

The Pearson Chi-square test (χ^2 -test) was used to analyze the statistical significance of variance across various percentages in qualitative data sets. Statistical significance was determined when the P-value was equal to or less than 0.05.

Results and Discussion

Results

Socio-demographic characteristics of mother

Table 1 shows the socio-demographic characteristics of study caregivers. The majority of participants are 18-25 years old, with 37.7%. Education has a higher percentage with high education 37.3%. Housewives make up 68.0%. For family size, 43.3% have 1-2 children, and mothers of children under five are 60.3% with one child.

Table 1: The distribution of the mothers according to Socio-demographic characteristics

Socio-demographic characteristics of mother		No.	%
Age	<18 years	7	2.3
	18 -25 years	113	37.7
	26-33 years	112	37.3
	>33 years	68	22.7
Educational Level	Illiterate	39	13.0
	Primary	66	22.0
	Secondary	83	27.7
	High education	112	37.3
Occupational	Employed	96	32.0
	Housewife	204	68.0
Number of children	1-2 Children	130	43.3
	3-4 Children	119	39.7
	5-6 Children	46	15.3
	>6 children	5	1.7
Number of children under 5 years of age	One	181	60.3
	Two	107	35.7
	Three	10	3.3
	Four	2	.7

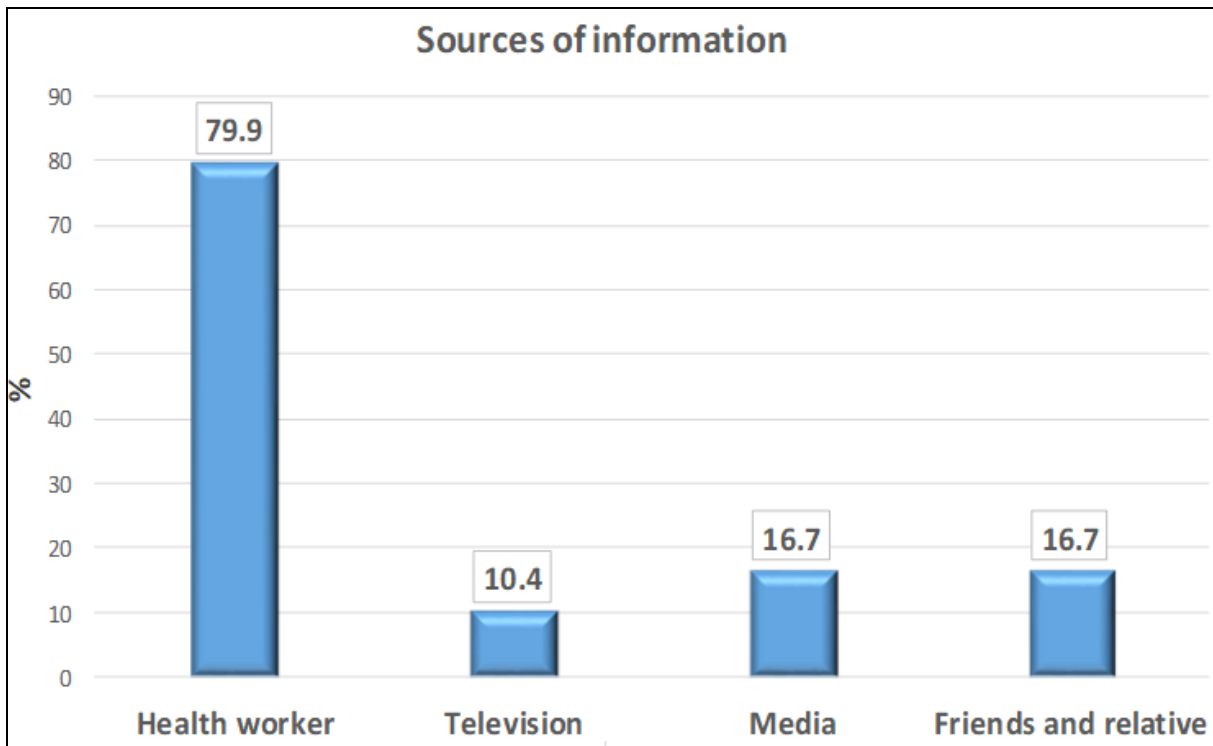


Fig 1: Multi-responses of the mothers according to their sources of information

Figure 1 shows that 79.9% of mothers' information comes from health workers. Media and friends/relatives share 16.7%, followed by television (10.4%).

Demographic characteristics of child

Child distribution by socio-demographic characteristics is shown in Table 2. The majority of children are 36-47 months (17.7%), followed by 24-35 months (17.3%) and 48-

59 months (17.0%). The sample includes 24.0% infants under 6 months, 7.3% 6-11 months, and 16.7% 12-23 months. In terms of child relationship, 75.0% are mothers and 25.0% are caregivers. Children are slightly more male (58.7%) than female (41.3%). Half of the children (50.0%) are in the 1-2 sequence, 34.0% in 3-4, 14.7% in 5-6, and 1.3% in >6.

Table 2: The distribution of the children according to Socio-demographic characteristics

Socio-demographic characteristics of child		No.	%
Age groups of child	< 6 months	72	24.0
	6-11 months	22	7.3
	12-23 months	50	16.7
	24-35 months	52	17.3
	36-47 months	53	17.7
	48-59 months	51	17.0
Relationship with the child	Mother	225	75.0
	Caretaker	75	25.0
Sex of the child	Male	176	58.7
	Female	124	41.3
Sequence of child	1-2	150	50.0
	3-4	102	34.0
	5-6	44	14.7
	>6	4	1.3

Knowledge of mothers/caregivers

Table 3 shows the distribution of mothers/caregivers' knowledge of under-5 immunization. The majority of respondents, 99.3%, recognized immunization's role in preventing infectious diseases and 99.7% in maintaining child health. 98.3% knew immunization reduces child

mortality, and 98.7% knew it controls diseases. Specific vaccine awareness varied: 95.0% identified measles, 93.3% tuberculosis, 95.7% polio, 92.0% pneumonia, 86.3% diarrhea, and 94.0% diphtheria, tetanus, and whooping cough. Hepatitis B vaccination was also acknowledged by 92.0%.

Table 3: The distribution of mothers/caregivers according to their knowledge about immunization

Knowledge of mothers/caregivers towards immunization	False		True	
	No.	%	No.	%
Can prevent infectious diseases	2	0.7	298	99.3
Keep child health	1	.3	299	99.7
Reduce child mortality	5	1.7	295	98.3
Rate diseases controlled by routine childhood immunization	4	1.3	296	98.7
Vaccine is given against				
Measles	15	5.0	285	95.0
Tuberculosis	20	6.7	280	93.3
Polio	13	4.3	287	95.7
Pneumonia	24	8.0	276	92.0
Diarrhoea	41	13.7	259	86.3
Diphtheria, tetanus, and whooping cough diseases	18	6.0	282	94.0
Hepatitis B virus	24	8.0	276	92.0



Fig 2: Illustrate the overall knowledge score of the participants

In Figure 2, the results of this study indicate that the highest percentage (91%) of the mothers have excellent assessment scores. While the lowest percentage (9%) of the mothers have an acceptable assessment score.

reveal that 85.7% of the participants strongly agree that vaccination is important. While vaccination safety is strongly agreed upon by 78.7%. The majority of mothers (82.3%) strongly recommend vaccinating children, but only 1.7% disagree. In terms of vaccination schedule adherence, 80.0% strongly agree.

Attitudes of mothers/caregivers: In Table 4, the results

Table 4: The distribution of mothers/caregivers according to positive attitudes towards immunization

Positive attitudes	Strongly disagree		Disagree		Uncertain		Agree		Strongly agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Vaccination is important	2	0.7	0	.0	8	2.7	33	11.0	257	85.7
Vaccination is safe	0	.0	0	.0	14	4.7	50	16.7	236	78.7
Recommend others to vaccinate their children	0	.0	5	1.7	8	2.7	40	13.3	247	82.3
Vaccination must be given according to schedule	1	0.3	3	1.0	14	4.7	42	14.0	240	80.0

In table 5, the results found that a high percentage 34.7% agree that vaccines have severe side effects. Also, the majority of mothers strongly disagree that vaccine side

effects can be fatal at a percentage 43.0%. In addition, 59.7% strongly disagree that vaccination is harmful.

Table 5: The distribution of mothers/caregivers according to negative attitudes towards immunization

Negative attitudes	Strongly agree		Agree		Uncertain		Disagree		Strongly disagree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Vaccines have severe side effects	28	9.3	104	34.7	67	22.3	58	19.3	43	14.3
Side effects of vaccines can death	15	5.0	24	8.0	50	16.7	82	27.3	129	43.0
Vaccination is harmful	6	2.0	8	2.7	35	11.7	72	24.0	179	59.7

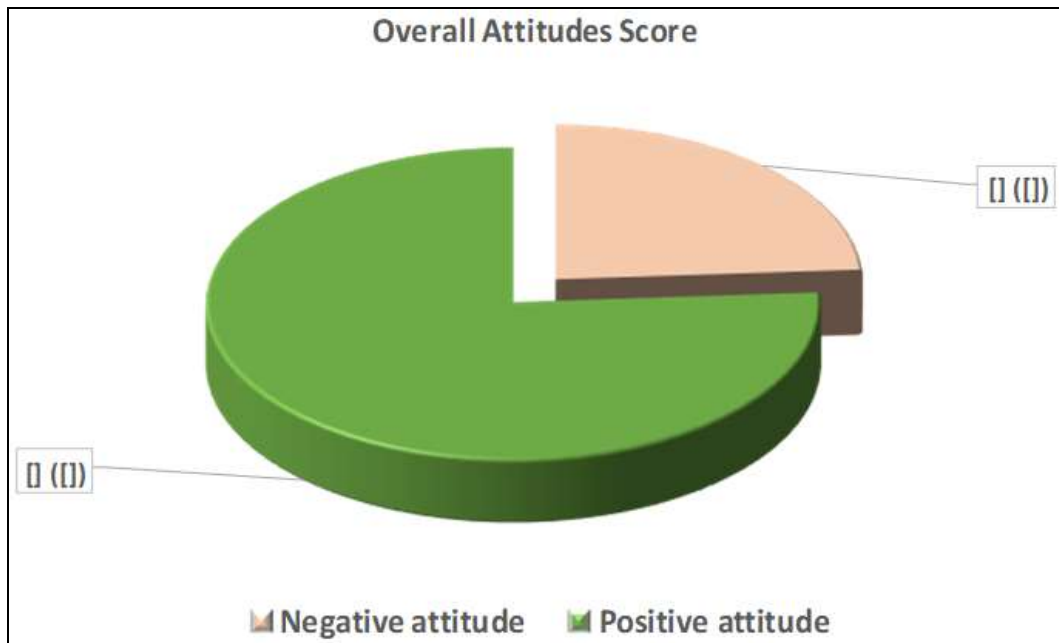


Fig 3: Illustrate the overall attitudes score of the participants

In Figure 3, the results of this study indicate that the highest percentage (76%) of the mothers have positive attitudes. While the lowest percentage (24%) of the mothers have negative attitudes.

3.6 Practice of mother/caregiver

Table 6 shows mothers/caregivers' immunization practices. The results found that most children received their first vaccine immediately after birth (86.7%), additionally,

98.0% of children have up-to-date immunization schedules, with only 2.0% not meeting this criterion. The distribution of fully and partially immunized children is notable, with 84.0% fully and 16.0% partially. The most common reason for partial immunization is lack of information (4.0%), followed by a lack of schedule knowledge (4.0%), fear of side effects (2.0%), unawareness of immunization's importance (1.3%), and accessibility (2.3%).

Table 6: The distribution of mothers/caregivers according to their practices towards immunization

Practice of mother/caregiver towards immunization		No.	%
When did a child receive first vaccine?	Immediately after birth	260	86.7
	1 month after birth	34	11.3
	>1 month	6	2.0
Is the child's vaccination schedule current?	No	6	2.0
	Yes	294	98.0
Partially immunized	Fully immunized	252	84.0
	Partial immunized	48	16.0
Reasons for partial immunization	Non	252	84.0
	Lack of information	12	4.0
	Lack of motivation	7	2.3
	Lack of knowledge regarding the schedule	12	4.0
	Fear of side effects	6	2.0
	Unaware of the importance of immunization	4	1.3
	Immunization centre was too far	7	2.3

Table 7 compares the overall knowledge score to mother-specific information sources. Mothers who did not receive health worker information had 14.8% an acceptable knowledge score and 85.2% an excellent score, with a p-value of 0.079. However, 7.5% of those who received health worker information scored acceptable and 92.5% excellent. For television information, 8.6% of mothers without access had an acceptable score, compared to 91.4% with an

excellent score (p-value = 0.423), while 12.9% had an acceptable score and 87.1% had excellent scores. Lack of media exposure was associated with a higher proportion of mothers with an acceptable score (7.6%) than those with access (16.0%), p-value 0.050. Knowledge scores were not significantly different for mothers who received information from friends and relatives.

Table 7: The relationship between the overall Knowledge score and sources of information of the mothers

Sources of information		The overall Knowledge score				P. value
		Acceptable		Excellent		
		No.	%	No.	%	
Health worker	No	9	14.8	52	85.2	0.079
	Yes	18	7.5	221	92.5	
Television	No	23	8.6	246	91.4	0.423
	Yes	4	12.9	27	87.1	
Media	No	19	7.6	231	92.4	0.050
	Yes	8	16.0	42	84.0	
Friends and relative	No	22	8.8	228	91.2	0.787
	Yes	5	10.0	45	90.0	

Table 8 shows how mothers' socio-demographic characteristics affect their knowledge score, the study shows

no statistically significant difference among knowledge score and socio-demographic characteristics of mothers.

Table 8: The relationship between the overall Knowledge score and socio-demographic characteristics of the mothers

		The overall Knowledge score				P. value
		Acceptable		Excellent		
		No.	%	No.	%	
Age	<18 years	1	14.3	6	85.7	0.593
	18 -25 years	8	7.1	105	92.9	
	26-33 years	13	11.6	99	88.4	
	>33 years	5	7.4	63	92.6	
Educational Level	Illiterate	0	.0	39	100.0	0.114
	Primary	5	7.6	61	92.4	
	Secondary	11	13.3	72	86.7	
	High education	11	9.8	101	90.2	
Occupational	Employed	10	10.4	86	89.6	0.556
	Housewife	17	8.3	187	91.7	
Number of children	1-2 Children	8	6.2	122	93.8	0.106
	3-4 Children	16	13.4	103	86.6	
	5-6 Children	2	4.3	44	95.7	
	>6 children	1	20.0	4	80.0	
Number of children under 5 years of age	One	18	9.9	163	90.1	0.699
	Two	9	8.4	98	91.6	
	Three	0	.0	10	100.0	
	Four	0	.0	2	100.0	

Table (9) shows how mother socio-demographic characteristics affect attitude scores. The present results found that participants aged over 33 had the most positive

attitudes (83.8%). Illiterate mothers had the most positive attitudes (84.6%). Mothers with 5-6 children had (82.6%) positive attitudes, statistically significant at P. value =0.016.

Table 9: The relationship between the overall attitudes score and socio-demographic characteristics of the mothers

		The overall Attitudes score				P. value
		Negative		Positive		
		No.	%	No.	%	
Age	<18 years	4	57.1	3	42.9	0.081
	18 -25 years	29	25.7	84	74.3	
	26-33 years	28	25.0	84	75.0	
	>33 years	11	16.2	57	83.8	
Educational Level	Illiterate	6	15.4	33	84.6	0.135
	Primary	22	33.3	44	66.7	
	Secondary	21	25.3	62	74.7	
	High education	23	20.5	89	79.5	
Occupational	Employed	21	21.9	75	78.1	0.554
	Housewife	51	25.0	153	75.0	
Number of children	1-2 Children	34	26.2	96	73.8	0.016
	3-4 Children	26	21.8	93	78.2	
	5-6 Children	8	17.4	38	82.6	
	>6 children	4	80.0	1	20.0	
Number of children under 5 years of age	One	42	23.2	139	76.8	0.787
	Two	28	26.2	79	73.8	
	Three	2	20.0	8	80.0	
	Four	0	.0	2	100.0	

The relationship between mothers' overall attitudes and child immunization practices is shown in Table 3.10. At the time of the child's first vaccine, 23.5% of mothers with a negative attitude had their child vaccinated immediately after birth, compared to 76.5% with a positive attitude, though the P-value is not significant. The child's immunization schedule was not significantly affected by attitudes, but 76.5% of mothers with positive attitudes updated it compared to 23.5% with negative attitudes.

Attitudes and immunization status were associated (P = 0.006), with 79% of fully immunized children having mothers with positive attitudes and 21% with negative attitudes. Lack of knowledge regarding the schedule(58.3%) was the most common reason for partial immunization and tending to a negative attitude, but (85.7%) mothers with lack motivation but were tending to a positive attitudes (P. value = 0.025).

Table 10: The relationship between the overall attitudes score and practices of the mothers

Practices		Overall Attitudes Score				P. value
		Negative attitude		Positive attitude		
		No.	%	No.	%	
When did a child receive first vaccine?	Immediately after birth	61	23.5	199	76.5	0.198
	1 month after birth	11	32.4	23	67.6	
	>1 month	0	.0	6	100.0	
Is the child's vaccination schedule current?	No	3	50.0	3	50.0	0.132
	Yes	69	23.5	225	76.5	
immunization status	Fully immunized	53	21.0	199	79.0	0.006
	Partial immunized	19	39.6	29	60.4	
Reasons for partial immunization	Non	53	21.0	199	79.0	0.025
	lack of information	3	25.0	9	75.0	
	lack of motivation	1	14.3	6	85.7	
	Lack of knowledge regarding the schedule	7	58.3	5	41.7	
	Fear of side effects	3	50.0	3	50.0	
	Unaware of the importance of immunization	2	50.0	2	50.0	
Immunization center was too far	3	42.9	4	57.1		

In Table 11, the Pearson correlation coefficient explains that there is a statistically significant positive relationship

between mothers' knowledge scores and attitudes (r=0.182, P. value=0.002).

Table 11: Correlation between the knowledge scores and attitudes of the mothers

Attitudes	Correlation		Knowledge
	Pearson Correlation		0.182**
	P. value		0.002
N		300	

** . Correlation is significant at the 0.01 level (2-tailed).

Discussion

Immunizations can support a nation's economic growth in a number of ways: individuals in a society have more time to work and less time to spend tending to ill children, when immunized children avoid contracting infectious diseases as adults, they can become valuable contributors to society (Rus & Groselj, 2021) [13].

One major factor that frequently leads to vaccination errors is parents' assumption that a minor illness will develop after a vaccination, which prevents parents from giving their children routine vaccinations, Parental cooperation and education are necessary to improve vaccination accuracy, by providing information and dispelling concerns about vaccination, it is possible to increase the effective vaccination rate by making parents more aware of the benefits of vaccination (Mugada *et al.*, 2017) [9].

The sample of this study consists of (300) mothers/caregivers who had children aged under 5 years attending primary health care centers in Basra governorate. The result of this study illustrated that the majority of participants are 18-25 years old, with (37.7%) for socio-demographic characteristics of study mothers/caregivers, and the highest percentage was (37.3%) with a high education, highest percentage is (68.0%) were housewives. This agree with results revealed in Karbala in 2021 from a

non-probability sample more than two third (70.6%) of mother were housewives (Hussain & Mohammed, 2021) [6]. Mothers with 5-6 children had 82.6% positive attitudes with statistically significant at p. value =0.016. Perhaps it is because they have gained more experience and knowledge of the benefits of the vaccine trend through their positions with their previous children and this disagrees with another study (Almutairi *et al.*, 2021) [2].

In this study, the results reveal that 85.7% of the participants strongly agree regarding vaccination is important, this may be indicate to an increase knowledge of mothers about the importance of immunization to promote the life of a person, this agreed with another study (Al-moukhtar & Al-, 2011) [1].

For mothers / caregivers' immunization practices for children under 5 years old. The results of this study found that most children received their first vaccine immediately after birth (86.7%), while others received it 1 month later (11.3%) or more than 1 month later (2.0%), This means that vaccine should start in the first week after birth, and this is consistent with another study (Siddiqui *et al.*, 2017) [14].

Lack of media exposure was associated with a higher proportion of mothers with an acceptable score (7.6%) than those with access (16.0%), P-value 0.050. This may be due to the lack of health educational programs regarding

vaccines in the media or the lack of interest in them by the public, or perhaps the public prefers direct contact with workers, as the information obtained about vaccines from health workers was the highest, and this is consistent with another study (Ramadan *et al.*, 2016) ^[11].

At 99.3%, almost all mothers wanted to vaccinate their children because they knew that it would protect them from getting dangerous diseases in the future. This is similar to another study that found more than 90% of parents wanted to vaccinate their children (Omer *et al.*, 2014) ^[10].

Higher percentage (85.7%) of mothers with lack motivation but tending with positive attitudes (P. value = 0.025), this may be the mothers not decisions about vaccination their children or may be pressuring their family about vaccination their children or may mistrust of medical experts as well as other information sources that may be affected on thinking about vaccination, This agree with the study in 2011 (Tobin-West & Alex-Hart, 2011) ^[15].

Lack of knowledge regarding the schedule (58.3%) was the most common reason for partial immunization and tending to negative attitude, This may require more information about important full recommended shots and the safety of immunizations (Esposito *et al.*, 2014) ^[4].

Their attitudes, knowledge, and practices were largely positive, but the sample was limited to specific and relatively few health centers, which requires a broader study and large samples to see the differences more clearly.

Conclusions

1. The overall knowledge score for participant's mothers/caregivers was (91%) excellent knowledge while (9%) had acceptable knowledge about immunization.
2. The result showed that mothers / caregivers have positive attitudes (76%) while (24%) have negative attitudes towards immunization.
3. The result found the mothers with 5-6 children had 82.6% positive attitudes, statistically significant at P. value = 0.016.

Recommendation

1. Government health services need to focus and support educational health programs in the field of immunization, change negative perceptions, and promote on positive attitudes among mothers towards the vaccine.
2. Promotion and broadening immunization research and studies

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Conflict of Interest

Not available

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Not available

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