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Implementation and Role of Health Education Program in Improving the Knowledge About Vaccination Among the Mothers of under five Years old Children in Erbil Governorate

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ABSTRACT

Parents' attitudes and degree of information surrounding child immunization may impact their practice. Deficiency of information about vaccinations, low levels of awareness or unfavourable attitudes about vaccinations, and false beliefs or rumours about the safety of vaccinations are major barriers to achieving high vaccination rates in children. To assess the level of knowledge about immunization among parents and the role of an educational program in improving the knowledge of a selected group of parents with low knowledge. A quasi-experimental study (pre and post-educational program) was conducted on 50 women selected from urban and rural areas of Erbil governorate, Kurdistan, Iraq, to participate in the educational program. The researcher developed the questionnaire. The data were analyzed by SPSS, version 26, software. A p-value of ≤ 0.05 was considered statistically significant. The chi-square test of association (or Fisher's exact test) was used to compare proportions. Most (88.6%) of the mothers mentioned that family, mother, or mother-in-law are the source of the first information about vaccination. Mothers in the Erbil governorate had medium knowledge scores before the program. There was development in their knowledge level after implementing a health education program, and all had high knowledge after the program. There was an improvement in the knowledge level after implementing the health education program, and all of them had high knowledge after the program; therefore, consistent health education sessions and reminders among mothers will solve the immunisation problems.

Keywords: Health education, Immunization, under-five children, Erbil governorate.



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INTRODUCTION

A vaccine is an immune-biological agent that aids in preventing a certain disease and encourages the creation of antibodies (JIP, 2015; Park, 2015). All individuals gain from illness inhibition through vaccination, which has a favourable impact on social, economic, and health outcomes at the international, governmental, and local levels. Immunization is a low-cost, life-saving measure against avoidable illnesses, impairments, and fatalities (Zaffran, 2014). By directly lowering the number of children dying from preventable causes or indirectly by lowering the prevalence of other infectious diseases, immunization and other related interventions will significantly aid in the achievement of the Millennium Development Goals (MDGs), which will ultimately lead to improved population health and a poverty reduction (Zaffran, 2014).

Over ten million children in little- and middle-income nations die before turning five each year. Most pass away because they lack access to efficient interventions to combat common and preventable babyhood diseases (Lee, 2003). To provide the best defence against illnesses, kids should receive all advised immunizations at advised ages (Chris-Otubor et al. 2015; Joseph et al. 2015). A child's quality of life would be improved if given the right immunizations, which would also greatly lower the costs of disease treatment and disease rates (Fad et al. 2017). Parents' attitudes and degree of information surrounding child immunization may impact their practice (ALAmri et al. 2018). Lack of awareness or information about vaccinations, low levels of awareness or negative attitudes about vaccinations, and false beliefs or rumours about the safety of vaccinations are major barriers to reaching high vaccination rates in children (Hu et al. 2016; Ramadan et al. 2016; Birhanu et al. 2016). Objectives: To assess the level of knowledge about immunization among parents and to assess the role of an educational program in improving the knowledge of a selected group of parents with a low level of knowledge.

METHOD

A cross-sectional descriptive study design (household survey) was conducted from May 15, 2021, to September 1, 2023. Data collection started on Aug 18, 2021, and ended on Dec 27, 2021. In addition, a quasi-experimental study (pre and post-educational program) was carried out from February 2, 2022 - May 31, 2022. Before collecting data, necessary approvals and official permissions were obtained from the presidency of Hawler Medical University, and ethical agreement was taken from the ethics committee of the College of Medicine, general security of Erbil governorate, and general directorate of Health-Erbil. Oral consent was taken from the mothers before starting the interview and health education program. In a previous study of the authors (which

was done to determine the immunization coverage), a Multi-stage cluster sampling method was carried out to collect 1025 women. There are six municipalities in Erbil city; three were selected using simple random sampling by Excel. Accordingly, municipalities number 3, 4, and 5 were selected. Then, five quarters were selected from each municipality, so the total randomly selected quarters were 15, as follows: Khanzad, Sarwaran Havalan, Manara, Mamostayan, Khabat, Mufty Ronaky Street, Gullan, Hawler New, Briaty, Safeen3, Andazyaran, Zankoo, Azady, Rasty, and Ronaky. Rural areas that the researcher had visited during the household survey were as follows: Kore, Babishtian Soran, Garota, Spekrah, Pongeen, Hujaran, Seberan, Kani qurzalla, Dosara jabar, Dosara fatih, Yaramja, Kardarash Zab, Qalamortic, Si parka, and Jajnikan Abu Bakir. For the health education program, a convenience sample of 50 women was selected out of the 1025 women; 30 women were selected conveniently from rural areas, and 20 women were taken from urban areas; more women were taken from rural areas as the proportion of defaulters was more in the rural areas. The researcher (with the help of a translator) discussed with the parents the role of vaccines in preventing communicable diseases, their safety and effectiveness in preventing disease, and encouraged the mothers to adhere to the vaccination schedule. A booklet made by the researcher was distributed to the mothers mentioned above in the Kurdish language. It included pictures and information about the vaccination process and communicable diseases to educate the parents about these topics, hence protecting the baby's health and improving the child's immunity system. A re-assessment of knowledge was carried out three months after the educational program.

The Knowledge part of the questionnaire consisted of 45 items that begin with the routes of administration of vaccines to the child (injection route, oral route) and finally to the sources of information about vaccination (television, internet and social media, friends, neighbours, health personnel, family, mother, mother-in-law, and others), and the reasons of dropout in those who are defaulters from immunization like (unaware of the need for immunization, unaware of the need to return for the second and third dose of the same vaccine, fear of side effects of the vaccines, a wrong idea about the contraindication of immunization, place/time of immunization are unknown, illness of the child, the mother is too busy, inconvenient time, place of immunization is too far to go, family problems including illness of the mother, long waiting time due to overcrowding in the health centre, postponed until another time, no faith in immunization, rumours, and others). Frequencies, Percentages, arithmetic mean, and standard deviation were calculated; figures and tables, Pie charts, and Bar charts were used for graphical presentation.

The statistical package for social sciences (SPSS, version 26) was used for data entry and analysis. The chi-square test of association was used to compare proportions. When the expected frequencies of more than 20% of the table's cells were less than 5, Fisher's exact test was used (instead of the Chi-square test). A non-parametric test (Wilcoxon signed rank test) was used to compare the median knowledge scores before and after the educational program. A p-value of ≤ 0.05 was considered statistically significant.

RESULT

Almost all mothers knew that the vaccines could be given by injection (99%) and oral route (98.9%), and 92.2% knew that the vaccines effectively prevented diseases, as presented in Table 1. It is evident in the table that 94.1% of the mothers identified that the first dose of vaccine should be given at birth. The majority (81.1%) of the mothers knew that regular rounds or campaigns are advantageous for increasing vaccination coverage, and 80.1% of them believed that there was a need for these campaigns even if the child had completed his/her scheduled immunizations. Most (80.2%) of the women knew that repeated vaccinations of poliomyelitis during campaigns do not lead to vaccine overdose. Regarding the contraindications of vaccine administration, only (12.4%) of the mothers recognized that the vaccine could be given to a child suffering from diarrhoea, (and 80.4%) of the mothers believe that the vaccine cannot be given to a child with high

fever (18.7%) of the mothers believe that the vaccine can be given to a child with common cold or mild flu, and (68.2%) of the mothers believe that vaccines cannot be given to children with malnutrition. Around two-thirds (65.1%) of the mothers said the child can eat or drink 30 minutes after oral vaccine administration. Less than half (39.3%) of the mothers knew that low birth weight children should not be immunized, and the majority (93.2%) of them knew that the vaccine doses (not only one jab) are important to protect a child's health.

Regarding the adverse reactions after immunization, 96.4% of the mothers knew that fever may occur, and 87.9% knew that swelling and redness at the injection site were possible adverse effects. The main reasons for dropout were as follows: child's illness (86.7%), unawareness of the need for immunization (83.5%), and unawareness of the need to repeat for second or third dose (81.9%). The other reasons are presented in the table. Regarding the reasons for parents to vaccinate their children, the largest proportion (94.6%) of the sample mentioned that the reason is to protect their children from diseases (Table 1).

Results:

Table 1: The knowledge about the vaccination (N=1025):

	Yes	No	I do not know
	No. (%)	No. (%)	No. (%)
What are the routes of vaccine administration?			
By injection*	1015 (99.0)	1 (0.1)	9 (0.9)
By oral route*	1014 (98.9)	2 (0.2)	9 (0.9)
Is the vaccine effective in preventing diseases?*	945 (92.2)	15 (1.5)	65 (6.3)
Should the first dose of vaccine be given to the baby at delivery?*	965 (94.1)	35 (3.4)	25 (2.4)
Are frequent rounds or campaigns useful for increasing vaccination coverage?*	831 (81.1)	69 (6.7)	125 (12.2)
If a child completed vaccination, is there a need for campaigns?*	821 (80.1)	152 (14.8)	52 (5.1)
Do repeated vaccinations of poliomyelitis during campaigns lead to vaccine overdose?*	159 (15.5)	822(80.2)	44 (4.3)
Can the vaccine be given to a child having diarrhoea?*	127 (12.4)	711 (69.4)	187 (18.2)
Can the vaccine be given to a child having a fever?*	60 (5.9)	824 (80.4)	141 (13.8)
Can the vaccine be given to children having mild flu or common cold?*	192 (18.7)	663 (64.7)	170 (16.6)
Can the vaccine be given to children with malnutrition?*	113 (11.0)	699 (68.2)	213 (20.8)
Can the baby eat or drink 30 minutes after administering the oral vaccine?*	667 (65.1)	142 (13.9)	216 (21.1)

Should the low birth weight infant (< 2.50 kg) be immunized?*	178 (17.4)	403 (39.3)	444 (43.3)
Do you know the vaccine doses are important to protect a child's health (not only one jab)?*	955 (93.2)	30 (2.9)	40 (3.9)
Is the occurrence of fever possible after getting immunized?*	988 (96.4)	10 (1.0)	27 (2.6)
Is the occurrence of swelling and redness at the site of injection possible after getting immunized?*	901 (87.9)	78 (7.6)	46 (4.5)
What are the causes of dropout?			
Unaware of the need for vaccination *	856 (83.5)	57 (5.6)	112 (10.9)
Unaware of the need to repeat for second or third dose*	839 (81.9)	66 (6.4)	120 (11.7)
Fear of side effects*	778 (75.9)	149 (14.5)	98 (9.6)
Wrong idea about contraindications*	773 (75.4)	133 (13.0)	119 (11.6)
Place and time are unknown*	717 (70.0)	262 (25.6)	46 (4.5)
Illness of child*	889 (86.7)	94 (9.2)	42 (4.1)
Mother too busy*	750 (73.2)	235 (22.9)	40 (3.9)
Inconvenient time*	738 (72.0)	245 (23.9)	42 (4.1)
Place of immunization too far to go *	714 (69.7)	267 (26.0)	44 (4.3)
Mother illness*	726 (70.8)	258 (25.2)	41 (4.0)
Long waiting time due to overcrowding in health centre *	711 (69.4)	272 (26.5)	42 (4.1)
Postponed until another time*	799 (78.0)	186 (18.1)	40 (3.9)
No faith in immunization *	762 (74.3)	225 (22.0)	38 (3.7)
Rumors*	760 (74.1)	227 (22.1)	38 (3.7)
What are the causes for parents to immunize their kids?			
To defend them from diseases*	970 (94.6)	22 (2.1)	33 (3.2)
To get a birth certificate or national ID*	893 (87.1)	122 (11.9)	10 (1.0)
To enter school*	949 (92.6)	66 (6.4)	10 (1.0)
To avoid punishment by the government **	33 (3.2)	985 (96.1)	7 (0.7)

*The correct answer is 'Yes'. **The correct answer is 'No.'

Table 2: Source of the first information about vaccination as mentioned by the mothers.

	Yes (%)	No (%)	Do not know (%)
Source of the first information about vaccines			
TV	520 (50.7)	505 (49.3)	0 (0.0)
Internet and social media	488 (47.6)	537 (52.4)	0 (0.0)
Friends	567 (55.3)	458 (44.7)	0 (0.0)
Neighbours	633 (61.8)	392 (38.2)	0 (0.0)
Health personnel	688 (67.1)	337 (32.9)	0 (0.0)
Family, mother, mother-in-law	908 (88.6)	117 (11.4)	0 (0.0)

Table 3: Knowledge score before and after health educational program (n = 50).

Total knowledge score	Mean	(SD)	Median	p*
Before the health education program	16.66	(1.97)	17	< 0.001
After the health education program	18.82	(1.35)	19	

*By Wilcoxon signed rank test

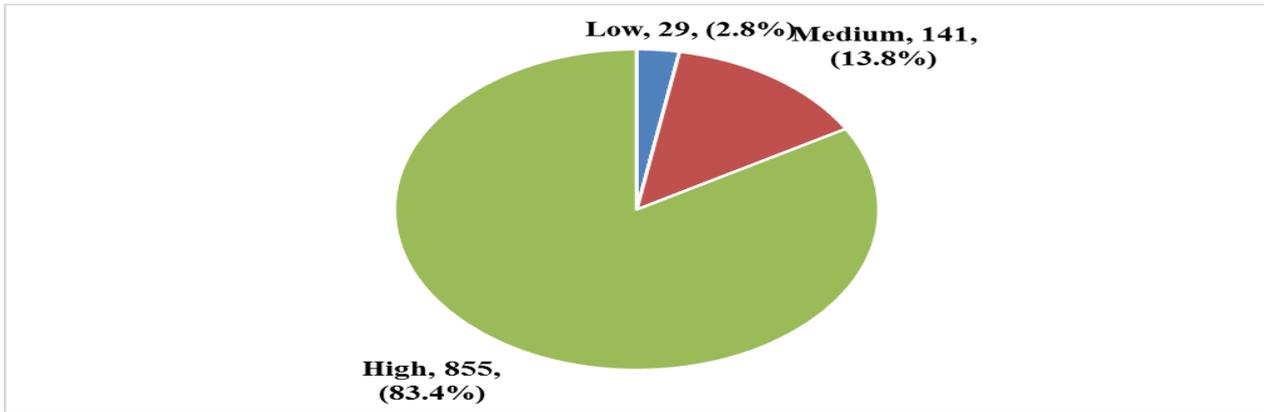


Figure 1: Knowledge score categories of mothers (the whole sample) before the educational program.

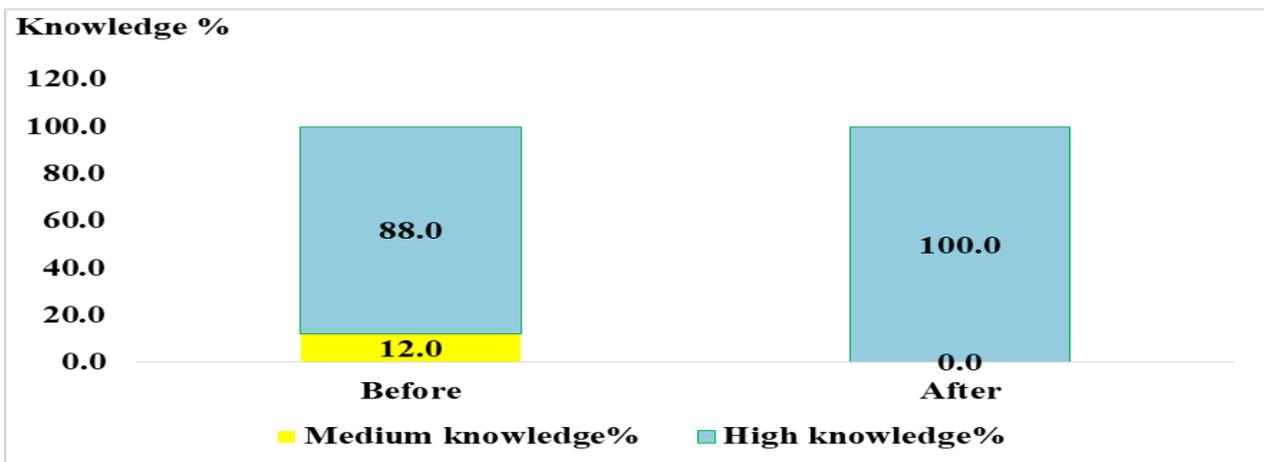


Figure 2: Knowledge before and after the educational program.

DISCUSSION

The majority of the mothers had high knowledge about vaccination. This could be related to the widespread of the primary health care centres' vaccination units, the health education programs in these centres that emphasise the meaning and safety of the vaccines, and the role of friends and social media. Almost all of the women knew the routes of vaccine administration (injection and oral routes). This high percentage is simply because of the mothers' previous experience observing their children while getting the vaccine. Most (92.2%) of the mothers knew that the vaccines effectively prevent diseases. This result coincides with the result of Almutairi et al. (2021) in Saudi Arabia, where most mothers (90.1%) knew that vaccination could prevent infectious diseases. This result disagrees with the study of Verulava et al. (2020) in Georgia, where they discovered that just 58% of participants supported immunization as a means of illness prevention. The majority (94.1%) of the mothers identified that the first dose of vaccine must be given at delivery. This result agrees with the study of Almutairi et al. (2021) in Saudi Arabia, where almost all (98.5%) of the mothers knew that vaccination was important for children from birth. The majority (81.1%) of the mothers knew that regular rounds or campaigns are valuable for increasing vaccination coverage, and 80.1% of them believed that there was a need for these

campaigns even if the child had completed his/her scheduled immunizations. In addition to that, the majority (80.2%) of the women knew that repeated vaccinations of poliomyelitis during campaigns do not lead to vaccine overdose. This coincides with the outcome of Olajide et al. (2014) in Nigeria. They found that 72.5% of respondents recognized that the Polio vaccine given several times can defend a child. Regarding the contraindications of vaccine administration, only 12.4% of the mothers knew that the vaccine could be given to a child suffering from diarrhoea, while a higher percentage (45.4%) was detected by Almutairi et al. (2021) in Saudi Arabia. On the other hand, 80.4% and 68.2% of the mothers believe that the vaccine cannot be given to a child with fever and malnutrition, respectively. These proportions are more than the study result of Almutairi et al. (2021) in Saudi Arabia, and they found that more than half (54.6%) of the mothers identified that fever and malnutrition are contraindications to vaccination. Only 18.7% of the mothers believe that the vaccine can be given to a child with a common cold or mild flu. This percentage was higher than what was reported by Thomas et al. (2015) in Nigeria, and they found that only 3.2% of mothers knew that a child with a cold could be vaccinated. Around two-thirds (65.1%) of the mothers knew that the child can eat or drink 30 minutes after administration of the oral vaccine, while Jawad and Al-Janabi (2019), in their study in Baghdad, demonstrated that 85.2%

of the mothers knew about the ability of the baby to eat or drink within half an hour after administration of polio drops. More than one-third (39.3%) of the mothers knew that low birth weight children should not be immunized, compared with 94% in a study done in Baghdad (Jawad and Al-Janabi, 2019). The majority (93.2%) of mothers knew that several vaccine doses are important to protect kids' health. Regarding the adverse reactions after immunization, 96.4% of the mothers knew that fever may occur. This outcome is in contrast with a study accomplished in Saudi Arabia, which found that 85.9% of the mothers knew that fever and pains were due to some vaccinations (Almutairi et al. 2021). Most (87.9%) of mothers knew that swelling and redness at the injection site are possible adverse effects after getting immunized. This result powerfully agrees with the result of Almutairi et al. (2021) in Saudi Arabia, and they found that 88.3% of the mothers knew that swelling and pain are possible adverse reactions to vaccination. The majority (83.5%) of mothers knew the unawareness of the need for immunization is a reason for dropout from immunizations. This result is incompatible with a study done in Bangladesh, and they found that 25% of the mothers mentioned the unawareness of the need for further immunization as one of the reasons for dropout from immunization (Rahman et al., 2012). Unregularly/cancelled EPI sessions, fear of side effects, mothers' poor knowledge of the advantages of complete vaccination, mothers' lack of knowledge about EPI sessions, geographical barriers, etc., are all factors that contribute to the low complete immunization coverage in Bangladesh's rural, difficult-to-reach hilly areas (Uddin et al., 2010). Regarding 'unawareness of the importance of second or third dose as a cause for dropout. The majority (81.9%) of the mothers agree with this cause, compared with 83.6% obtained in a study done in Baghdad (Jawad and Al-Janabi, 2019). Most (75.9%) of mothers agreed that 'fear from side effects' is one reason for dropout. This result disagrees with the result of a study done in Jordan that demonstrated that 29.2% of mothers think that vaccines cause side effects (Masadeh et al., 2014). Mothers in Bangladesh stated that despite the fact that side effects like fever, redness, and rash are frequent and typically go away on their own in a day or two, they were still reluctant to vaccinate their children (Rahman et al., 2012). Armenian parents frequently cite concern over adverse reactions as a reason for not vaccinating their kids (UNICEF and WHO, 2006). In some instances, parents opted not to vaccinate their newer children if an older sibling or colleague's child had unkind effects. In certain records, it is said that adverse reactions become a problem when fathers or mothers-in-law grow offended and reject additional immunization (Favin et al., 2012). This discomfort might or might not be sufficient to prevent under vaccination, depending on other circumstances. According to several mothers, better health worker communication, such as

informing caregivers about the side effects, what to expect, and what to do, might eliminate this issue (Favin et al., 2012). The majority (75.4%) of the mothers knew that 'misconception about vaccination' is a reason for dropout. This result is different from the study of Babitha and Suresh (2020) in India, where none of the mothers considered this reason a cause for partial immunizations. Most (70 %) of the mothers believe that not knowing the place and time of immunization is considered a reason for dropout, compared with 80% of women in a study done in Baghdad (Jawad and Al-Janabi, 2019). The majority (86.7%) of the mothers knew that the child's illness was one of the reasons for dropout. This result is higher than the study's result done in India, where 36.7 % of mothers demonstrated this reason as a cause for partial immunizations (Babitha and Suresh, 2020). A numeral of worries and myths, including those that say underweight children shouldn't be immunized and that unwell kids should not have immunizations. They also say that kids shouldn't receive numerous vaccinations in the same visit. The most typical fake contraindication is reported in Pakistan (WHO and EPI, 1987). Health professionals rationally explain why they won't vaccinate unwell children: they worry that the vaccination will be responsible if the child's health worsens, and they say they're just following the mother's wishes. Nurses in Kenya said that they wanted to examine the scientific proof of the security of vaccinating unwell children (Qidwai et al., 2007). Most of the mothers would not immunize their child if the child was having a slight upper respiratory tract infection or if the child had a fever (Mahalingam et al., 2014). An evaluation of mothers' vaccination knowledge revealed a substantial difference between urban and rural moms regarding the value of vaccination and the age at which the immunization schedule should begin and end. These gaps must be corrected to achieve nationwide immunization coverage of 100%, particularly in rural regions (Mahalingam et al., 2014). After learning more about vaccination, the majority of women in both urban and rural settings supposed that vaccinations were safe. However, many mothers in both urban and rural settings would postpone immunizing their children in the event of a simple childhood illness (Mahalingam et al., 2014). The majority (73.2%) of the mothers knew that being too busy is one of the reasons for dropout. This outcome is inconsistent with a study done in India, where 8.9 % of mothers mentioned that being busy is a reason for partial immunizations (Babitha and Suresh, 2020). The majority (72%) of the mothers mentioned that 'inconvenient time' is a reason for dropout. This result is incompatible with a study done in India where none of the mothers considered an 'inconvenient time of immunization' as a reason for partial immunizations (Babitha and Suresh, 2020). More than two-thirds (69.7%) of the mothers mentioned that remote place of immunization is a reason for dropout, compared

with 0% in an Indian study (Babitha and Suresh, 2020). Mother illness is one of the reasons for dropout, as stated by the majority (70.8%) of the mothers. This result is inconsistent with the study result of Babitha and Suresh (2020) in India, where none of the mothers mentioned the above reason. More than two-thirds (69.4%) of mothers knew that long waiting times due to overcrowding in health centres are one of the reasons for the drop in vaccinations. This outcome is similar to the study result of Jawad and Al-Janabi (2019) in Baghdad, who demonstrated that 62.9% of the mothers agreed with this reason. The majority (78.0%) of mothers mentioned that postponing the time of vaccination to another day is one of the reasons for dropout, compared with 31.6% reported in an Indian study (Babitha and Suresh, 2020). The majority of the mothers considered 'no faith in immunization and rumours' (74.3% and 74.1%, respectively) as reasons for dropout in vaccinations. This outcome was inconsistent with the study's outcome done in India, which demonstrated that none of the mothers believed in this reason (Babitha and Suresh, 2020). Many women in Syria thought that the polio vaccine rendered their children paralyzed. Some individuals in Ethiopia thought that vaccinations could result in sterility, paralysis, abscesses, and illnesses like HIV/AIDS or that they were being utilized as test subjects for particular medical treatments (Bisrat, 2008). Regarding the reasons for parents to vaccinate their children, the largest proportion (94.6%) of the sample mentioned that the reason is to protect their children from diseases. This result strongly agrees with a study done in Saudi Arabia; they found that 98.5% of the mothers knew even a healthy child needs vaccinations to prevent diseases, and 97.3% of mothers recognized that the vaccines save children well (Almutairi et al. 2021). Another study done in Jordan found that 70.7% of the mothers believed that the vaccines could protect their children against the spreading of contagious diseases. While more than two-thirds (66.6%) of the mothers use other behaviours to defend their kids from infection (Masadeh et al., 2014).

Knowledge score before the health educational program: In this study, mothers' knowledge about vaccination was assessed by asking mothers to identify the names of vaccines and their compliance with the mandatory vaccines according to the National Vaccination Program. The majority of the mothers (71%) were aware of the name of the given vaccine; this coincides with the results of studies done in El Salvador and Nigeria (Suarez-Castaneda et al., 2014; Umeh and Ahaneku, 2013 respectively). While in another study conducted in India, it was said that women must be confident in the safety of vaccines and that myths must be eradicated. The failure of mothers to name or recognize illnesses other than poliomyelitis suggests that health education must be prioritized to improve understanding of the entire program (Mahalingam et al., 2014).

Regarding the foundation of the first information about vaccines, more than half (50.7%) of the mothers mentioned that TV is the source of information about vaccines. This result is inconsistent with the result of Jawad and Al-Janabi (2019) in Baghdad, who stated that 77.1% of mothers depend on the same source (TV) for information about vaccination. For the second basis of the first information about vaccines, 47.6% of women depended on the internet and social media. This result is incompatible with the study results of Tabacchi et al. (2017) in southern Italy; they mentioned that the main information source on vaccination was 17.6% and 24.1% for internet and mass media, respectively. Regarding friends and neighbours as a source for first information, 55.3% and 61.8% of the mothers, respectively, agree. This study is incompatible with the results of Coates et al. (2013) in Angola, and they stated that (33%) of friends and neighbours were the source of information. More than two-thirds (67.1%) of the mothers mentioned that health personnel are the first source of information about vaccines. This result disagrees with the result of Tabacchi et al. (2017) in southern Italy, who mentioned that 12.5% of the respondents depended on healthcare workers for information on vaccination. The majority (88.6%) of the mothers mentioned that family, mother, or mother-in-law are the source of first information. This result doesn't coincide with the study result of Riccò et al. (2017); they stated that 8.4% of participants recalled relatives as the source of information. Mothers who got their information about vaccination from medical staff, posters/brochures offered by the medical centre had higher vaccination knowledge/attitude scores compared with those who got the information from Internet websites and family members and friends or neighbours (Masadeh et al., 2014).

Health education program:

According to a study, misunderstandings, a lack of knowledge, and a lack of faith in the healthcare system all contribute to an increase in vaccine reluctance. This claim was supported by evidence showing how ineffective vaccination education programs reduced vaccination readiness. (Leask, 2011). According to this study, several students who opposed mandatory vaccination talked about enhancing patient education and interpreting information about vaccinations (Harmsen et al., 2013). Parents' desire for additional vaccination-related knowledge is one of the causes of vaccine reluctance. Knowing both the advantages and disadvantages of each vaccine can help them make educated decisions about their child's healthcare (Harmsen et al., 2013). A third of parents said they lacked access to enough information, and the majority of those parents said they didn't find it easy to communicate with their child's provider (Gust et al., 2005). Many parents want more in-depth information about the drawbacks and advantages of vaccines explained in a factual manner that doesn't seem to be trying

to persuade them one way or the other about immunizing their child (Harmsen et al., 2013). Parents can be given access to a variety of print and online resources, including those from the American Academy of Pediatrics and the Centers for Disease Control and Prevention. Parents desire to be able to speak openly with their child's doctor without fear of being judged or attacked (Dubé et al., 2014). Parents would like to be able to question things without feeling judged. One of the most crucial information sources for parents who are making decisions about their children's health is their doctors (Dubé et al., 2014). A study conducted by Kennedy et al. (2011) noted that 81.7% of parents said their child's healthcare provider was one of the most important sources of information. When parents don't receive the information they need from their providers, they go for it elsewhere, where it may be misleading and inaccurate, leading them to make bad decisions for their kids (Fredrickson et al., 2004). Pharmacists and other healthcare professionals will be better equipped to conduct enlightening discussions regarding vaccines if they can comprehend the primary worries parents have about vaccinating their children. They will also be able to give parents the data they require to make the best choices for their children (McKee and Bahannon, 2016). Just like any other parent, parents who are reluctant to vaccinate their children or who refuse vaccinations care about their kids and want to do everything in their power to protect them. In order for families to grasp the advantages of vaccination without feeling attacked or criticized for having questions about their child's healthcare, practitioners must have open and honest talks with their patients and their families (Saada et al., 2015). Parents' views toward immunization have been proven to improve modestly as a result of education and patient time spent with them, but the precise messages or methods that healthcare professionals should employ have not yet been fully uncovered (Williams et al., 2013). Understanding the reasons behind parents' questions can help pharmacists, doctors, nurses, and other healthcare professionals connect with patients on a more personal level and address the topics that matter most to parents. All healthcare professionals should make an effort to be informed about the recommended vaccinations and to comprehend the rationale behind those recommendations. Patients will now have direct access to trustworthy information that will enable them to choose the best course of action for their families. More analysis is needed to determine how professionals can aid parents by properly educating them (McKee and Bahannon, 2016). According to one point of view, the disparities in maternal knowledge across geographical regions are caused by mothers' lack of knowledge about vaccinations administered in hospitals after birth, which is the case today, when all deliveries take place in hospitals or primary healthcare facilities, and mothers adhere to the vaccination schedule.

Furthermore, we think that mothers' attitudes and immunization practices may be impacted by the knowledge they learn in hospitals or basic healthcare facilities. Furthermore, social media may have a significant (positive or negative) impact on mothers' understanding due to false beliefs or misconceptions about the safety of vaccinations that are spread by the media and the Internet (Almutairi et al., 2021).

Limitations of the Study: There were some barriers that interfered with the interview period and educational session about vaccination with mothers from rural areas due to the nature and transportation in addition to the distances away from the centre; language is the most important barrier that interferes with the study, especially in the rural areas because all of them didn't know the Arabic language. Therefore, the researcher needs the translator's help.

Strengths of the study: Up to the researcher's knowledge, this is the first comprehensive survey in the Erbil governorate that compares the knowledge level of mothers in the urban and rural areas before and after the implementation of the health education program.

CONCLUSION: The mothers in Erbil governorate had a medium knowledge score before the program. There was an improvement in their knowledge level after the implementation of the health education program, and all of them had high knowledge after the program; therefore, regular health education sessions and reminders among mothers will solve the problems of immunization.

Ethical Approval Statement

This research study, titled "**Implementation and Role of Health Education Program in Improving the Knowledge About Vaccination Among the Mothers of under five Years old Children in Erbil Governorate**" conducted by [*Farqad Ahmed Jawad*¹, *Namir Ghanim Al-Tawil*²], has received ethical approval from the [ethical committee of Hawler medical college] at [Hawler medical university].

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AUTHOR'S CONTRIBUTIONS

All authors contributed equally to the conception and design of the study, data collection, and analysis, and drafted the initial manuscript. All authors critically reviewed and edited the

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DISCLOSURE STATEMENT:

The authors report no conflict of interest.

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