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Mother's awareness about immunization

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ABSTRACT

Background: Proper children immunization lowers the cost of treating illnesses. The safety and effectiveness of child vaccines are frequently questioned by parents. *Objectives:* This study sought to evaluate women in KSA who had children under the age of five about their knowledge, attitudes and practices towards immunization. *Methods:* A cross sectional study done was done in KSA, on 406 mothers a questionnaire to collect data about participants' demographics and their knowledge, attitude and practice regarding childhood vaccination. *Results:* 98.3% of mothers felt that immunizations are essential for children's health (96.8%), the prevention of infectious diseases (90.9%), the reduction of death or disability (80%) and the maintenance of childhood health (96.8%). Mothers believed that immunizations are useful in 97.5% of cases and are safe in 96.1% of cases. Of these, 84.7% are in favors of the Ministry of Health's mandatory vaccination policies. In terms of mother's behavior, 98.3% said their children had got mandatory vaccines and 96.1% said they adhered to scheduled mandatory immunization programs. Among them, 78.8% of the moms had a high level of vaccination knowledge, 83.5% had a positive attitude and 67% had a high level of practice. Mothers >35 years old were significantly more likely to have a high level of vaccination practice and knowledge scores were significantly positively correlated with attitude and practice scores as well as knowledge and practice scores. *Conclusion:* The majority of studied mothers had good knowledge, attitude and practice regarding childhood immunization. The level of parents' KAP was associated with mothers' age.

Keywords: Mothers, awareness, childhood, immunization, KAP, KSA

1. INTRODUCTION

In the last few decades, vaccination has reduced the burden of infectious diseases. In addition, vaccination represents an important aspect of disease disability and death prevention. The most common diseases that can be prevented with the vaccine are rubella, scab, diphtheria, tetanus, whooping coughand polio (Almutairi et al., 2021).

Vaccination is the administration of a vaccine that helps the body build

immunity to the disease. This is the most cost-effective disease prevention mechanism that allows people to protect themselves from certain bacteria and viruses (Gualano et al., 2019). A vaccination is made up of weakened or dead bacteria or viruses that are given to people in order to activate their immune system and protect them from bacterial, viral or fungal illnesses (Alshammari et al., 2021). Immunization is an important element of a child's development. Immunization decreases illness transmission and consequently saves society from hazardous diseases. Immunization is an important preventative health measure for children since it prevents them from the deadliest childhood illnesses. If the kid obtainsthe complete course of prescribed vaccine doses, the immunization process will be more successful (Greenwood et al., 2014).

Proper vaccination of children can significantly reduce the cost of treating illness and the incidence of illness, thereby improving the quality of life of children. WHO estimates that infectious disease mortality rates range between 2 and 3 million annually. The vaccines for children in Saudi Arabia are planned by the Saudi Ministry of Health from birth to the age of 6 to protect children from diseases that can be prevented by vaccination (Gualano et al., 2019).

Since 1984, the EPI has been used as a fundamental and necessary component of primary health care in Saudi Arabia. In Saudi Arabia, the elementary immunizations recognized in the Vaccination Certificate, since delivery till entry in to primary school, are intended to protect children in Saudi Arabia and wholly board clusters in the public alongside infections beleaguered thru vaccination, as well as to keep the Kingdom free of polio and to eliminate measles, rubella and mumps, as well as to reduce infection rates of other diseases (Al-Mutairi et al., 2019). Despite great efforts by health officials to retain KSA get ride of Diphtheria Pertussis, Tetanus, Polio, and Measles, a lot of physicians confront significant challenges from parents over the safety, efficacy and necessity of frequent kid immunizations. The majority of parents in the Kingdom of Saudi Arabia believe that immunizations may cause autism and other disorders (Almutairi et al., 2021).

According to a worldwide assessment released by the CDC, the majority of parents have a negative view about kid immunization programs. Furthermore, some parents believed that polio vaccine would reduce fertilityrates hence parents' attitudes play a crucial part in the vaccination process because they are the decision makers for their children. Since the delivery day, parents' knowledge, attitude and practice pattern toward vaccination might giveearly prevention from numerous infectious illnesses, disabilities and other causes of mortality (Olson et al., 2020). None the less, the high vaccination rate may notimply Saudi public trust in vaccinations for two reasons. First, the mandatory need of a thorough immunization for children's admittance to school is probably definitely influencing parents' decisions to vaccinate their children. Second, parents continue to be concerned about kid immunizations. Furthermore, various causes have been described in the literature that weakens vaccination rates, such as medical economical, religious or philosophical grounds (Shati et al., 2022).

Parents are the primary and most significant health choice creators meant for their off spring, as well as the single determinants and most critical advocates for boosting compliance rates and achieving comprehensive immunization programs. As a result, their knowledge and attitude toward immunization have a substantial influence on their children's vaccination status. A frequent and continuous assessment of public knowledge and attitudes concerning children immunization is required to identify key areas for improvement and to develop focused interventions to influence views, ensuring the effectiveness of vaccination programs (Damnjanović et al., 2018). This study aimed to assess the knowledge, attitude and practice of mothers with children under the age of five regarding immunization in Saudi Arabia.

2. SUBJECTS AND METHODS

Study design

Setting and time

This was a cross sectional study done at the Kingdom of Saudi Arabia in the time from 1 January to 31 May 2022.

Study participants

All mothers in Saudi Arabia were the subjects of the present study. The inclusion criteria were mothers who voluntary agreed to share in the study, who have children aged less than 1 year and who have mothers with children under the age of five and who attend a routine immunization clinic at a designated center. The exclusion criteria were mothers who were mentally or critically ill, refused to participate inthe study, married women with no children, who have one child or more older than five years or not living in Saudi Arabia.

Sample size

An expected minimum sample of 400 mothers was calculated using a margin of error of 5% and a confidence interval of 95%.

Data collection

A self reporting questionnaire was used that consisted of four parts. The 1st part included items to collect the participants' demographic characteristics, number of children and child age. The 2nd part included the mother's knowledge regarding childhood vaccination. The 3rd part included the mother's attitude toward childhood vaccination and the 4th part included the mother's practice inrelation to childhood vaccination. The participants' responses were measured using dichotomous questions and multiple-choice questions. The total knowledge score ranged from 0 to 11 with a higher score denoting a better knowledge. The attitude part had four questions (R = 0–4) and practice part included four questions (R = 0–4). Participants who had at least 80% correct answers were considered as having good knowledge. Participants with at least 80% positive answers were considered as having a positive attitude and the same was applied for good practice.

Ethical considerations

The study was approved from the research ethics committee of Taif University with approval number (HAO-02-T-105). The study aim was explained to all mothers in the sample and an online informed consent was obtained.

Data analysis

Data were statistically analyzed using the (SPSS) application version 26. To assess the relationship between the variables, the Chi-squared test ($\chi 2$) was applied to qualitative data that was expressed as numbers and percentages. A p-value of less than 0.05 was regarded as statistically significant.

3. RESULTS

Table 1 shows that 57.4% of studied mothers had an age >35 years, 90.9% had a Saudi nationality and 47.8% were from Macca region. Of them, 93.8% were married and 75.4% had a bachelor's degree of education. More than half (52.5%) were employed or having a monthly income ranging from 10000-15000 SR. About 41% (41.9%) had 2-3 children and 76.4% had a child with an age of 2-5 years. Most of the participants (98.3%) agreed that vaccination is important for children from the first day of birth and 90.9% agreed that it prevents infectious diseases. Of them, 80% agreed that vaccination reduce death or disability and 96.8% agreed that vaccination keep children healthy. About 94% (94.6%) agreed that diphtheria, tetanus and whooping cough can be controlled through vaccinations and hepatitis B virus can be prevented. About 95% (95.3%) agreed that childhood vaccinations control measles, but only 47.5% agreed that high temperature and diarrhea are not contra indications to vaccination. Of them, 91.9% agreed that some vaccinations associated with high fever and pain. Only 49.5% agreed that vaccinations can cause cramps and rashes, while 94.8% agreed that a healthy child need vaccination as well (Table 2). Figure 1 illustrates that the most common sources of information about vaccination among mothers were health care centers (52%), social media platforms and search (34.7%) and books and magazines (33.7%).

Table 3 shows that 97.5% of mothers thought that vaccinations are beneficial and 96.1% felt that it is safe to vaccinate their children. Of them, 84.7% support compulsory vaccination programs by the Ministry of Health. And 97.5% advise their relatives and family to vaccinate their children. As for the mother's practice, 98.3% reported that their children received mandatory vaccinations. Of them, 96.1% follow the compulsory vaccination programs scheduled in the vaccination schedule. Only 71.7% were looking for other vaccinations available for their child and 95.6% use pain relievers and antipyretics after their children were vaccinated. Figure 2 demonstrates that 21.2% and 78.8% of mothers had a poor and a good level of knowledge about vaccination respectively while 16.5% and 83.5% had poor and good attitude respectively. While 33% and 67% had a poor and a good level of practice towards vaccination respectively.

A non significant relationship was found between participants' knowledge or attitude level towards vaccination and their demographic data and children number and age (p=>0.05) (Table 4 and 5). While mothers > 35 years old and those from Macca region had a significant higher percent of having a good practice level regarding vaccination (p=<0.05) (Table 6). Figure 3, 4 and 5 shows that a significant positive correlation was found between knowledge scores and both the attitude and the practice scores (p=<0.05). The same significant positive correlation was found between attitude scores and the practice scores (p=<0.05).

Table 1 Presentation of the contributors concerning their demographic data and children number and age (No: 406)

Variable	No (%)
Age (years)	
18-35	173 (42.6)
>35	233 (57.4)
Nationality	
Saudi	369 (90.9)
None- Saudi	37 (9.1)
KSA region	
Riyadh region	59 (14.5)
Eastern District	53 (13.1)
Qassim region	27 (6.7)
Medina area	4 (1)
Tabuk region	7 (1.7)
Hail region	2 (0.5)
Asir region	60 (14.8)
Macca area	194 (47.8)
Marital status	
Widow	6 (1.5)
Married	381 (93.8)
Divorced	19 (4.7)
Educational level	
Middle school or less	29 (7.1)
Secondary school	71 (17.5)
Bachelor's degree	306 (75.4)
Employment status	
House wife	169(41.6)
Student	24(5.9)
Employed	213 (52.5)
Monthly income	
<10000 SR	150(36.9)
10000-15000 SR	213(52.5)
>16000 SR	43(10.6)
Children number	
One	137 (33.7)
2-3	170 (41.9)
>3	99 (24.4)
Child age	
<2 years	96 (23.6)
2-5 years	310 (76.4)

Table 2 Distribution of studied participants according to their response to knowledge items regarding immunization (No: 406)

Variable	No No (%)	Yes No (%)
Is it important to vaccinate babies from the first day they are born?	7 (1.7)	399 (98.3)
Can vaccinations prevent	37 (9.1)	369 (90.9)

infectious diseases?		
Does vaccination reduce death or disability?	81 (20)	325 (80)
Can immunization retain infants well?	13 (3.2)	393 (96.8)
Can diphtheria, tetanus and whooping cough be controlled through vaccinations?	22 (5.4)	384 (94.6)
Can immunizations protect against the hepatitis B virus?	22 (5.4)	384 (94.6)
Can childhood vaccines protect against measles?	19 (4.7)	387 (95.3)
Is it true that hunger, high fever, and diarrhoea are not restrictions to vaccination?	213 (52.5)	193 (47.5)
Are some vaccinations associated with high fever and pain?	33 (8.1)	373 (91.9)
Are vaccines associated with cramping and rashes?	205 (50.5)	201 (49.5)
Is it necessary to vaccinate a healthy youngster as well?	21 (5.2)	385 (94.8)

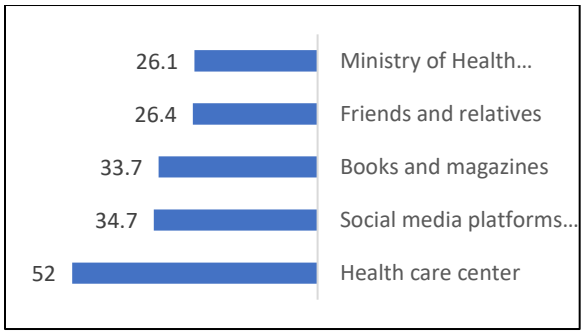


Figure 1 Percentage distribution of the participants according to their sources of information about vaccination (No: 406)

Table 3 Distribution of studied participants according to their response attitude and practice items towards immunization (No: 406)

Variable	No No (%)	Yes No (%)
Attitude		
Do you believe that immunizations are advantageous?	10 (2.5)	396 (97.5)
Do you feel it is safe to vaccinate your child?	16 (3.9)	390 (96.1)
Do you support compulsory vaccination programs by the Ministry of Health?	62 (15.3)	344 (84.7)
Do you recommend that your acquaintances and colleagues vaccinate their offspring?	10 (2.5)	396 (97.5)
Practice		
Has your child received mandatory	7 (1.7)	399 (98.3)

vaccinations?		
Do you adhere to the mandatory immunization programmes outlined in the vaccine schedule?	16 (3.9)	390 (96.1)
Are you looking for other vaccinations available for your child?	115 (28.3)	291 (71.7)
Do you use pain relievers and antipyretics after your child is vaccinated?	18 (4.4)	388 (95.6)

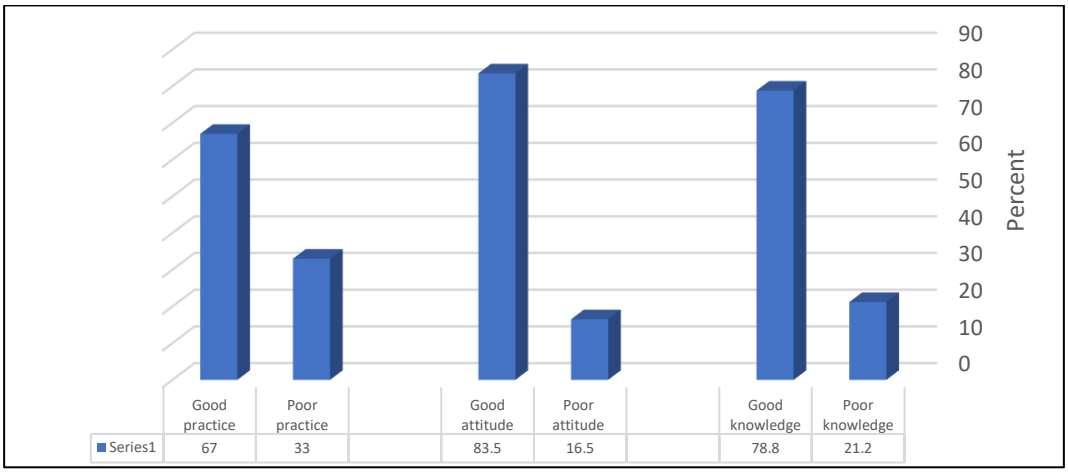


Figure 2 Percentage distribution of the participants according to their level of knowledge, attitude and practice regarding vaccination (No: 406)

Table 4 Relationship between knowledge level about vaccination and participants' demographic data and children number and age (No: 406)

Variable	Knowledge level			
	Poor No (%)	Good No (%)		
Age (years)				
18-35 >35	40 (46.5) 46 (53.5)	133 (41.6) 187 (58.4)	0.67	0.41
Nationality				
Saudi None Saudi	78 (90.7) 8 (9.3)	291 (90.9) 29 (9.1)	0.005	0.945
KSA region				
Riyadh region Eastern District Qassim region Medina area Tabuk region Hail region Asir region Macca area	14 (16.3) 14 (16.3) 6 (7) 2 (2.3) 2 (2.3) 0 (0.0) 14 (16.3) 34 (39.5)	45 (14.1) 39 (12.2) 21 (6.6) 2 (0.6) 5 (1.6) 2 (0.6) 46 (14.4) 160 (50)	5.59	0.588
Marital status				

Widow Married Divorced	1 (1.2) 80 (93) 5 (5.8)	5 (1.6) 301 (94.1) 14 (4.4)	0.38	0.827
Educational level				
Middle school or less Secondary school Bachelor's degree	7 (8.1) 19 (22.1) 60 (69.8)	22 (6.9) 52 (16.3) 246 (76.9)	1.92	0.381
Employment status				
House wife Student Employed	36 (41.9) 4 (4.7) 46 (53.5)	133 (41.6) 20 (6.3) 167 (52.2)	0.31	0.854
Monthly income				
<10000 SR 10000-15000 SR >16000 SR	46 (53.5) 34 (39.5) 6 (7)	167 (52.2) 116 (36.3) 37 (11.6)	1.56	0.457
Children number				
One 2-3 >3	20 (23.3) 32 (37.2) 34 (39.5)	79 (24.7) 105 (32.8) 136 (42.5)	0.58	0.745
Child age				
<2 years 2-5 years	14 (16.3) 72 (83.7)	82 (25.6) 238 (74.4)	3.27	0.07

Table 5 Relationship between attitude level towards vaccination and participants' demographic data and children number and age (No: 406)

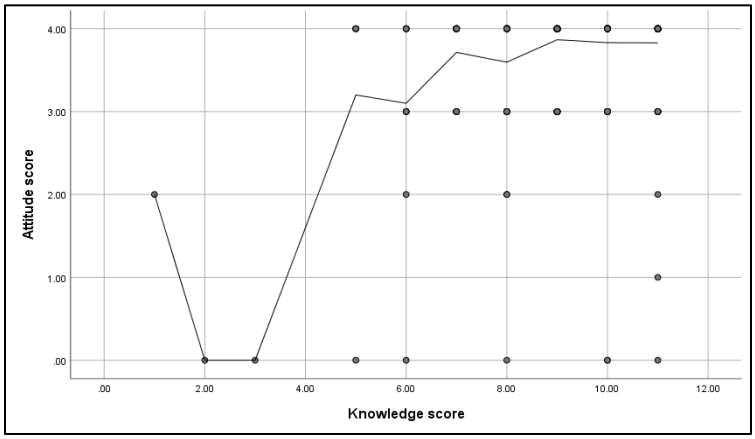
Variable	Attitude level			
	Poor No (%)	Good No (%)		
Age (years)				
18-35 >35	28 (41.8) 39 (58.2)	145 (42.8) 194 (57.2)	0.02	0.882
Nationality				
Saudi None Saudi	62 (92.5) 5 (7.5)	307 (90.6) 32 (9.4)	0.26	0.607
KSA region				
Riyadh region Eastern District Qassim region Medina area Tabuk region Hail region Asir region Macca area	13 (19.4) 7 (10.4) 3 (4.5) 2 (3) 2 (3) 1 (1.5) 7 (10.4) 32 (47.8)	46 (13.6) 46 (13.6) 24 (7.1) 2 (0.6) 5 (1.5) 1 (0.3) 53 (15.6) 162 (47.8)	8.94	0.257
Marital status				
Widow Married Divorced	1 (1.5) 62 (92.5) 4 (6)	5 (1.5) 319 (94.1) 15 (4.4)	0.3	0.861
Educational level				

Middle school or less Secondary school Bachelor's degree	6 (9) 13 (19.4) 48 (71.6)	23 (6.8) 58 (17.1) 258 (76.1)	0.68	0.71
Employment status				
House wife Student Employed	23 (34.3) 3 (4.5) 41 (61.2)	146 (43.1) 21 (6.2) 172 (50.7)	2.47	0.291
Monthly income				
<10000 SR 10000-15000 SR >16000 SR	32 (47.8) 28 (41.8) 7 (10.4)	181 (53.4) 122 (36) 36 (10.6)	0.85	0.654
Children number				
One 2-3 >3	14 (20.9) 23 (34.3) 30 (44.8)	85 (25.1) 114 (33.6) 140 (41.3)	0.57	0.752
Child age				
<2 years 2-5 years	16 (23.9) 51 (76.1)	259 (76.4) 80 (23.6)	0.002	0.96

Table 6 Relationship between practice level regarding vaccination and participants' demographic data and children number and age (No: 406)

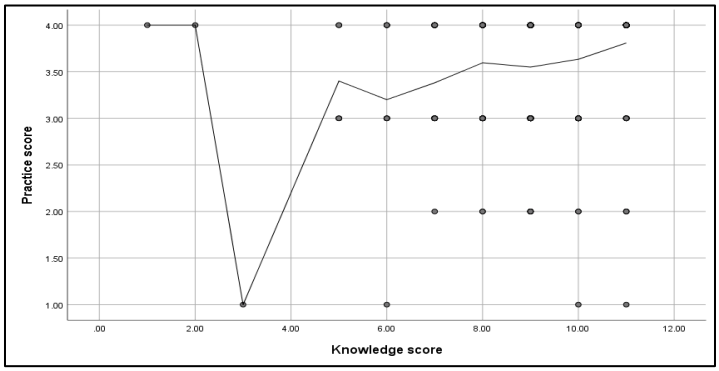
Variable	Practice level			
	Poor No (%)	Good No (%)		
Age (years)				
18-35 >35	69 (51.5) 65 (48.5)	104 (38.2) 168 (61.8)	6.45	0.011
Nationality				
Saudi None Saudi	121 (90.3) 13 (9.7)	248 (91.2) 24 (8.8)	0.08	0.773
KSA region				
Riyadh region Eastern District Qassim region Medina area Tabuk region Hail region Asir region Macca area	29 (21.6) 22 (16.4) 11 (8.2) 2 (1.5) 2 (1.5) 0 (0.0) 17 (12.7) 51 (38.1)	30 (11) 31 (11.4) 16 (5.9) 2 (0.7) 5 (1.8) 2 (0.7) 43 (15.8) 143 (52.6)	15.54	0.03
Marital status				
Widow Married Divorced	2 (1.5) 128 (25.5) 4 (3)	4 (1.5) 253 (93) 15 (5.5)	1.28	0.525
Educational level Middle school or less Secondary school Bachelor's degree	 8 (6) 21 (15.7) 105 (78.4)	 21 (7.7) 50 (18.4) 201 (73.9)	0.99	0.607
Employment status				

House wife	60 (44.8)	109 (40.1)		
Student	8 (6)	16 (5.9)	0.87	0.647
Employed	66 (49.3)	147 (54)		
Monthly income				
<10000 SR	72 (53.7)	141 (51.8)		
10000-15000 SR	52 (38.8)	98 (36)	2.09	0.35
>16000 SR	10 (7.5)	33 (12.1)		
Children number				
On e	34 (25.4)	65 (23.9)		
2-3	53 (39.6)	84 (30.9)	4.28	0.117
>3	47 (35.1)	123 (45.2)		
Child age				
<2 years	37 (27.6)	59 (21.7)	1.74	0.187
2-5 years	97 (72.4)	213 (78.3)		



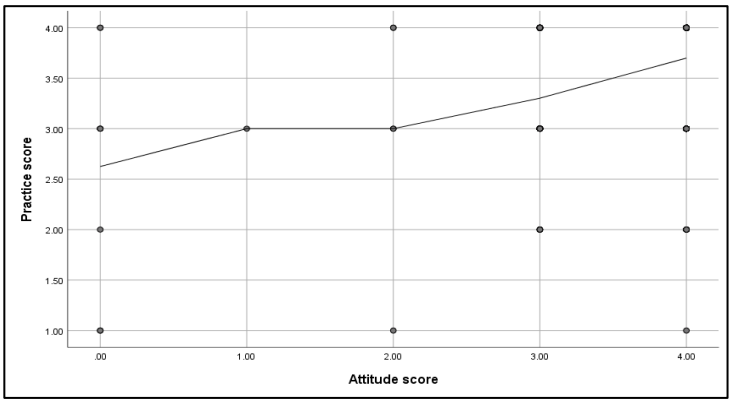
N.B. (r= 0.2, p-value = <0.001)

Figure 3 Spearman's correlation analysis between knowledge scores and attitude scores



N.B. (r= 0.23, p-value = <0.001)

Figure 4 Spearman's correlation analysis between knowledge scores and practice scores



N.B. (r= 0.29, p-value = <0.001)

Figure 5 Spearman's correlation analysis between attitude scores and attitude scores

4. DISCUSSION

The present work found that 78.8% of mothers had a good level of knowledge about vaccination, 83.5% had good attitude and 67% had a good level of practice towards vaccination. The same was observed in previous Saud studies where Saudi mothers were familiar, by means of optimistic arrogances apropos immunization in addition, they confirmed respectable applies (Almutairi et al., 2021). The same was noted by Alfahl et al., in 2017, who found that the majority of Saudi parents had good vaccination habits, with 92.8% indicating that their children were immunized in accordance with the recommended schedule. Given that 75.4% of the analyzed sample had a bachelor's degree, the higher educational level of this sample may help to explain the good level of KAP that was observed. Adefolalu et al., (2019) study revealed the same conclusion of high attitude levels: of the participating moms, 72.0% had generally good understanding, 100% had a favorable attitude and 98.8% said that childhood immunization is crucial.

About 98% (98.3%) of the participants in our study agreed that immunization is crucial for kids starting on the day of their birth, and 90.9% believed that it helps prevent infectious diseases. In contrast to a Saudi Arabian study by AL Amri et al., (2018), which found that parents' attitudes toward vaccination were positive (34.2%), with the exception of some aspects relating to the side effects of vaccination and the likelihood of diseases the child was vaccinated against occurring was 39.4%. When compared to the findings from (Wani et al., 2017), our findings are outstanding. They discovered that although 65% of mothers recognized the recommended age for vaccinations and when they needed to begin, they were unaware of the rationale behind them. And 58% thought that vaccinations are safe (Wani et al., 2017). This shows that the mothers' views about vaccination were positive because the majority of the moms adhered to the recommended vaccination schedule and considered that vaccination was important (Wani et al., 2017). When compared with the results of a research steered in Addis Abeba, Ethiopia, the good level of KAP indicated by the current study is significantly superior (Ramadan et al., 2016). The study discovered that the participating women had poor practice scores and little awareness about required vaccines (Ramadan et al., 2016).

The WHO and UNICEF reports on Saudi national immunization coverage issued on July 6, 2020 provided evidence of Saudi parents' strong attitudes and practices regarding children's immunization. The reports showed that coverage of bcg was 98%, dpt1 coverage was 96%, dpt3 coverage was 96%, pol3 coverage was 97%, ipv1 coverage was 95%, mcv2 coverage was 96%, rcv1 coverage was 95%, hepb coverage was 96%, hib3 coverage was 95% and pcv3 coverage was 96% (WHO et al., 2019). In terms of the correlation between KAP levels and the demographics of the moms, mothers over the age of 35 had a significantly greater percentage of good immunization practice. The similar thing was seen in a prior Saudi study, where the mother's age was one of the common characteristics linked to higher knowledge and attitude (Almutairi et al., 2021). The similar result was seen in a research lead in Ethiopia, where there was a connection between knowledge level and mother's age (Ramadan et al., 2016).

The bulk of Saudi parentages exhibited positive KAP toward immunization in their 2018 study, which was conducted by Alshammari et al., (2021). This positive KAP was unrelated to gender or educational attainment. KAP levels at current employment and all mothers; demographics other than age were shown to be unrelated. On the other hand, moms' work and degree of education were linked to higher levels of knowledge and attitude (Adefolalu et al., 2019). The most common sources of information about vaccination among studied mothers were health care centers (52%), social media platforms and search (34.7%) and books and magazines (33.7%). Alfahl, et al., (2017) in their Saudi study revealed that most of the participants (58.1%) received their information regarding child vaccination from medical staff, followed by social media (17.4%) and books (14%) (Alfahl et al., 2017), the same result was observed in previous studies, where institutions (49.5%) and internet were the most common sources (Mugada et al., 2017).

A significant positive correlation was found between knowledge scores and both the attitude and the practice scores in this study. Previous studies found that higher knowledge would lead to positive attitudes and practices (Sinuraya et al., 2022) and studies highlighted a strong correlation between the lack of parents' knowledge about vaccines and unsuccessful implementation of immunization programs (Qutaiba et al., 2014).

Limitation

A limitation of this study was the use of a self reported questionnaire that could have a recall bias.

5. CONCLUSION

This study found that 98.3% of mothers agreed that vaccination is important for children, it prevents infectious diseases (90.9%), vaccination reduce death or disability (80%) and vaccination keep children healthy (96.8%). Of mothers, 97.5% supposed that immunizations are advantageous and 96.1% felt that it is innocuous to immunize their children. Of them, 84.7% support compulsory vaccination programs thru the Ministry of Health. As for the mother's practice, 98.3% reported that their children received mandatory vaccinations and 96.1% follow compulsory vaccination programs scheduled. Of them, 78.8% of mothers took a respectable awareness about vaccination, 83.5% had good attitude and 67% had good practice. Mothers > 35 years had a significant higher percent of having a good practice level regarding vaccination and a significant positive correlation was found between knowledge scores and both the attitude and the practice scores and between attitude and practice scores.

Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study. Additional informed consent was obtained from all individual participants for whom identifying information is included in this manuscript.

Acknowledgement

We thank the participants who were all contributed samples to the study. Author Contributions we certify, as authors, that we have participated sufficiently in the intellectual content, conception and design of this work or the analysis and interpretation of the data (when applicable), as well as the writing of the manuscript, to take public responsibility for it and have agreed to have our name listed as a contributor. All persons who have made substantial contributions to the work reported in the manuscript.

Ethical approval

The study was approved from the research ethics committee of Najran University, southern Saudi Arabia, with letter number (HAO-02-T-105).

Funding

This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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