KNOWLEDGE, ATTITUDE AND PRACTICE OF PARENTS TOWARDS CHILDHOOD VACCINATION

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ABSTRACT

Background: *The prevention and treatment of hypertension are a high priority in medicine Background: It has been recently reported by WHO that a large proportion of children fail to complete their immunization schedule. System weaknesses, low public awareness, fears and misconceptions about vaccines were responsible for that. Despite nearly 100% vaccination rate in Saudi Arabia, often parents delay vaccination and do not fully understand the value of immunization, except that it is mandatory for birth certification and admission in school.* ***Objectives:*** *To assess parental knowledge and attitude regarding vaccination and their effects on vaccination practice.* ***Methodology:*** *A cross-sectional study was conducted using a self-administered Arabic questionnaire, including 20 questions related to parental knowledge, attitude, and practice regarding childhood vaccination. It was distributed in PHC settings.* ***Results:*** *The study included parents of 390 children. Factors significantly associated with better knowledge score and positive parental attitude regarding child vaccination were source of information about child vaccination from TV, internet and journals/newspapers, parents with first child, younger age, and higher level of education. There was a moderate positive correlation between total knowledge score and total attitude score of child vaccination ($r=0.382$, $p<0.001$).* ***Conclusion:*** *Positive attitude towards immunizations was remarkably high in this study group of parents. Knowledge on childhood immunizations, however, was not significantly higher in those who reportedly receive information from health professionals.*

ملخص: الاحصاءات الحديثة من منظمة الصحة العالمية تبين أن نسبة كبيرة من الأطفال لا تستطيع الوصول إلى الخدمات الخاصة بالتطعيم أو أن تكمل جدول التطعيم المقرر , و بينت أيضا أن فقدان خدمات التطعيم سببه ضعف النظام الصحي، قلة وعي الآباء, الخوف و بعض الاعتقادات الخاطئة عن التطعيم. على الرغم من أن المملكة العربية السعودية حققت ما يقرب من 100٪ في معدل تطعيمات الأطفال ، إلا أن الآباء في كثير من الأحيان لا يتبعون الجدول الزمني المقرر للتطعيمات ، و بعضهم لا يعرفون من أهمية التطعيم إلا أنه إلزامي للحصول على شهادة الميلاد والقبول في المدارس. **هدف البحث:** يهدف البحث إلى استطلاع مدى معرفة الآباء و توجهاتهم نحو تطعيم الأطفال و أثر ذلك على ممارساتهم .**طرق البحث:** تم إجراء دراسة مقطعية باستخدام استمارة استبيان باللغة العربية تشتمل على 20 سؤالا تتعلق بمعرفة الآباء و التوجهات و الممارسات في مجال تطعيم الأطفال. تم اعتماد الاستبيان المحتوي على 20 بندا بعد أخذ الإذن من المؤلف. **نتائج البحث:** ضمت الدراسة آباء 390 طفلاً، العوامل التي ارتبطت بمعرفة أفضل لدى أولياء الأمور كانت مصادر المعلومات عن تطعيم الأطفال (تليفزيون، انترنت، صحف و مجلات)، وجود طفل أول في ترتيب العائلة، الأمهات الصغيرات في السن، الأمهات العاملات، ارتفاع مستوى تعليم الأمهات و الآباء. أما العوامل التي ارتبطت باتجاه إيجابي لأولياء الأمور نحو تطعيم الأطفال فكانت مصادر المعلومات (تليفزيون، انترنت، صحف و مجلات)، الآباء الصغار و الأمهات الصغيرات في السن، ارتفاع مستوى تعليم الآباء والأمهات. كان هناك ارتباط ايجابي ذو دلالة معنوية بين المعرفة و الاتجاه نحو تطعيم الأطفال (معامل الارتباط =0.382 و مستوى الدلالة (<0.001)**الخلاصة:** معدل الاتجاه الايجابي نحو تطعيم الأطفال كان ممتازا في هذه المجموعة من أولياء الأمور ، لكن مستوى المعرفة عن تطعيم الأطفال لم يكن مرتفعا ارتفاعا ذا دلالة معنوية بين من تلقوا معلوماتهم من الأطباء.

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INTRODUCTION

Immunization of children against serious communicable diseases is the most cost effective strategy to decrease overall morbidity and mortality among children.[1,2] In order to accomplish this strategy, high coverage of vaccination is essential to be maintained.[1,3]

When the Expanded Programme on Immunization (EPI) was launched in 1974, less than 5% of the world's children were immunized during their first year of life against six killer diseases; Polio, Diphtheria, Tuberculosis, Pertussis (Whooping Cough), Measles and Tetanus.[4] From 1984 onward, the EPI has been implemented in Saudi Arabia as an integral and essential element of primary health care.[5]

Over 1.5 million children die from vaccine preventable diseases as reported by WHO. Previous estimated number of all deaths in children under five in 2008 was 8.8 million, and 17% of all deaths in children under five are preventable by vaccination.[6] The WHO estimates that current immunization programs save more than 3.2 million lives each year and the full utilization of existing vaccines could save an additional 1.7 million lives per year.[7]

Recent analysis from WHO showed failure of a large proportion of children to access immunization services or to complete their immunization schedule. Lack of services due to system weaknesses, low public awareness, or fears and misconceptions about vaccines were some of the influencing factors.[8]

Vaccination coverage can be affected by many other factors like low socioeconomic status and low education level. These factors can play a role in delay or finishing full set of vaccination.[9] Despite notable improvement, still around three million children are permanently disabled each year.[10, 11] Studies suggest that parents and health care providers are uncomfortable with multiple injections in single visits.[12-14] Even in areas with high coverage, it is important to know attitudes and behaviours toward immunizations in order to improve services and maintain high coverage rate.[15]

Since 1979, the government has supported the practice of tying the issuing of birth certificates for successful completion of first two years of life primary immunizations against diseases which are targeted by available vaccines. The National Immunization Program has achieved eradication of neonatal tetanus and polio. Still efforts are needed to eradicate measles, rubella and mumps, and to reduce the incidence of the remaining communicable diseases.[16]

The recent data issued by WHO Office for the Eastern Mediterranean Region, reported that twenty countries in the region are free from polio. As for the regular immunizations against the diseases targeted by childhood vaccination, the rate of immunization reached over 97% in Saudi Arabia over the past five years.[17, 18]

Despite nearly 100% childhood vaccination rate in Saudi Arabia, often parents do not follow the schedule in a timely manner, and do not fully understand the value of immunization except that it is mandatory for birth certification and admission in school. Thus, this study aimed at assessing parental knowledge, attitude and practice toward vaccination of their children.

METHODS

This cross-sectional study was conducted at two primary care centers (Health Care Specialized Centre [HCSC -Khashm Alaan] and King Abdulaziz Housing Clinic [Iskan]), National Guard Health Affairs, Riyadh, Saudi Arabia. These two clinics serve a total population of over 150,000

patients of which at least one third are children.

All parents visiting the primary care with their children were enrolled for interview if they agreed to participate.

The sample size was estimated based on the assumption that 93% of the parents would have a positive attitude based on the UAE study,[19] with a margin of error ± 3%. Using a confidence interval of 98% a sample size of 380 was obtained, which was adjusted up to 400 for data losses. By convenient non-random sampling, parents who visited the two primary care clinics with their children were recruited to participate in the study after their agreement. The appointment schedule was not influenced by the recruitment process during the study period.

Eligible participants were asked to fill a self-administered questionnaire including 20 statements related to knowledge, attitude and practice of parents visiting the clinic with their children. The 20-item Arabic Questionnaire was adopted after permission from validated questionnaire in Iraq. [20]

The questionnaire included the demographic data for child (age, birth weight, gender, feeding, number of preschool children and child order) and demographic data for parents (age, employment and education), knowledge related questions [14], attitude questions [5] and one practice Question. For knowledge questions, scores were summed up for correct answers. No negative marking was done and higher score indicated higher knowledge level. For attitude, Scores were summed up for correct answers. No negative marking was done and higher score indicated more positive attitude.

The collection and interview parts were supervised by assigned staff nurse, to ensure good compliance while collecting the data and help during filling of the questionnaire.

DATA ENTRY AND ANALYSIS

Data were analysed by using SPSS software statistical program, version 18. Summarization of the data was presented using tables and graphs. The following statistics were applied: Continuous variables (total knowledge and attitude scores) were presented as mean and standard deviation (SD). Categorical variables were presented as frequency and percentage. Significance was determined at p value < 0.05. Chi square test was applied to test for the association between categorical variables while t-test was used to test for the difference in the means of two continuous variables.

Ethical committee approval was obtained from the Family Medicine Research Committee of the Department of Family Medicine & Primary Health Care in King Abdulaziz medical city. Verbal Consent was taken from respondents, clarifying the main purpose of the study, the importance of the respondent views, thanking in advance and assuring strict confidentiality of the information with consent statement on the Questionnaire. All data were maintained in a secure and confidential manner. Data were analysed as cumulative in a manner that individual privacy was maintained.

RESULTS

The study included parents of 390 children. Response rate was 96%. Table (1) presents the children characteristics. Over 43% of the children were below 1 year old. More than one-third of them (36.4%) were between one and three years old. More than half of them were males (56%). Majority of children (69.7%) had a birth weight of above 2.5 kg. Breast feeding was reported among only 24% of them while bottle and mixed feeding were reported among 34%

and 42% of them, respectively. Regarding birth order, most of them were second or more (72.4%). Mothers represent 60.2% of the participants. The majority of them (86.2%) were not employed and 29.7% of them were university/college graduates. Fathers represent 39.8% of the participants. Most of the fathers were employed (96.1%) but only 18.8% of them had university degree.

Characteristic	*Frequency (%)*
Child age: (385)	
< one year	166 (43.1)
(1 – 3) years	140 (36.4)
≥ 4 years	79 (20.5)
Child gender: (389)	
Male	218 (56)
Female	171 (44)
Child birth weight: (386)	
≤ 2.5 kg	117 (30.3)
> 2.5 kg	269 (69.7)
Child feeding: (388)	
Breast Feeding	93 (24)
Bottle Feeding	132 (34)
Both	163 (42)
Preschool children: (279)	
One	165 (43.5)
02-Mar	163 (43)
≥ 4	51 (13.5)
Child order: (387)	
First child	107 (27.6)
Second or more	280 (72.4)
Parent participating: (384)	
Father	153 (39.8)
Mother	231 (60.2)
Mother employment: (390)	
Employed	54 (13.8)
Not Employed	336 (86.2)
Mother education: (390)	
Primary	89 (22.8)
Intermediate	65 (16.7)
Secondary	120 (30.8)
College/university	116 (29.7)
Father employment: (389)	
Employed	374 (96.1)
Not Employed	15 (3.9)
Father education: (389)	
Primary	33 (8.5)
Intermediate	86 (22.1)
Secondary	197 (50.6)
College/university	73 (18.8)

Figure (1) shows that physicians were the main source of information (77.7%) for the parents about immunization, followed by TV (37.6%), Internet (21.7%) and newspapers (13.3%).

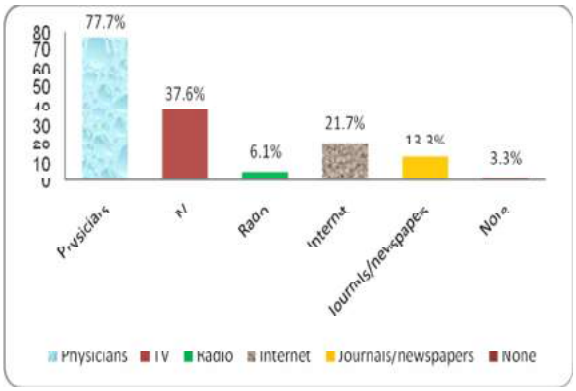


Figure (1): Source of parent information about childhood vaccination

Table (2) shows that fever was the most commonly reported adverse effect of vaccination by parents (74.2%) followed by pain (48.6%). Skin rash and convulsions were reported by only 4.9% and 4.1% of the participants, respectively. Less than half of the parents (46.5%) reported that the maximum limit for vaccines per visit should be recommended by physicians.

More than half of the participants (60.2%) believed that vaccine is for all ages. The majority of them recognized correctly that vaccination prevents diseases (82.6%), that there are different types of vaccines (87.4%), a uniform schedule for children under the age of 2 years (83%), vaccination enhances immunity (89.2%) and healthy child need vaccination (85.9%). More than half of the parents recognized that there are situations in which vaccine cannot be given (58.5%). The majority of the parents did not accept that harm of the vaccine is more than benefits (92.8%) or multiple vaccines in one visit decrease immunity (85.6%).

Parents` total knowledge score ranged between 1 and 11.4 (out of 11) with a mean of 8.08 and SD of 1.8

Table 2: Parental knowledge about vaccination (right answers).

N	*Item*	*Frequency (%)*
1	Adverse effects of vaccines*:	
	Fever	290 (74.2)
	Pain	190 (48.6)
	Skin rash	19 (4.9)
	Diarrhoea	42 (10.7)
	Convulsions	16 (4.1)
	Don't know	49 (12.5)
2	Maximum limit of vaccines per visit:	
	1-2 vaccines	149 (38.1)
	3-4 vaccines	57 (14.6)
	5 or more	3 (0.8)
	Recommend by physician	182 (46.5)
3	Vaccine for all ages	234 (60.2)
4	Vaccination prevent disease	323 (82.6)
5	Different types of vaccines	339 (87.4)
6	Uniform schedule less than 2 years	322 (83)
7	Vaccination start first week of life	279 (71.7)
8	Situations you can't give the vaccine	227 (58.5)
9	Harm of vaccines more than benefits	28 (7.2)
10	Vaccination enhance immunity	348 (89.2)
11	Healthy child need vaccination	335 (85.9)
12	Multiple vaccines in one visit decrease immunity	56 (14.4)

Table (3) presents the significant factors associated with better parents` knowledge of child vaccination. Regarding their source of information about child vaccination, those whose source was TV showed higher significant total knowledge score (8.5±1.69 versus 7.83±1.83), p<0.001. Similarly, those whose source was internet showed higher significant total knowledge score (8.68±1.3 versus 7.91±1.89), p<0.001. Parents whose source of information was journals/newspapers showed higher significant total knowledge score (8.54±1.54 versus 8.01±1.83), p<0.049.

Variables	***Total knowledge score***		***t-value* (p-value)***
	Mean	SD	
TV(source of information)			
No (242)	7.83	1.83	3.62
Yes (146)	8.5	1.69	(<0.001)
Internet			
No (303)	7.91	1.89	3.53
Yes (85)	8.68	1.3	(<0.001)
Journals/newspapers			
No (336)	8.01	1.83	1.97
Yes (52)	8.54	1.54	-0.049
Child birth order			
First (107)	8.42	1.78	2.24
Second or more (277)	7.97	1.79	-0.026
Mother`s age			
≥30 (203)	7.79	1.91	3.45
<30 (181)	8.42	1.63	-0.001
Mother`s employment status			
Employed (54)	8.9	1.55	3.63
Not employed (333)	7.95	1.81	(<0.001)
Mother`s education			
School education (271)	7.77	1.79	5.27
College degree (116)	8.79	1.64	(<0.001)
Father`s education			
School education (313)	7.91	1.8	3.77
College degree (73)	8.78	1.66	(<0.001)

Parents with first order children showed higher significant total knowledge score about vaccination than those with second or more child birth order (8.42±1.78 versus 7.97±1.79), p<0.026. Younger mothers (<30 years) showed higher significant total knowledge score about vaccination than order (≥30 years) (8.42±1.63 versus 7.79±1.91), p=0.001. Employed mothers showed higher significant total knowledge score about vaccination than non-employed (8.9±1.55 versus 7.95±1.81), p<0.001. Higher educated mothers had significant higher total knowledge score about child vaccination than less educated (8.79±1.64 versus 7.77±1.79, p<0.001). Higher educated fathers had significant higher total knowledge score about child vaccination than less educated (8.78±1.66 versus 7.91±1.80, p<0.001.

Table (4). Parental attitude and practice of child vaccination.

	Item	Frequency
Practice	Regular vaccination	304 (77.7)
Attitude	Barriers against vaccination:	
	a) Loss of education	172 (44.1)
	b) Vaccine availability	67 (17.2)
	c) Limited service	35 (9)
	d) Fear	61 (15.6)
	e) Don't know	148 (37.9)
	Vaccination not safe	309 (79.4)
	Prefer to vaccinate your child	367 (93.9)
	Recommend vaccination to others	378 (96.9)
	In favour of vaccination program	337 (96.7)

As illustrated in Table (4), regular child vaccination was reported by 77.7% of the parents. Missing school due to clinic visit for vaccination (44.1%), vaccine non-availability (17.2%), limited service (9%) and fear (15.6%) were the reported barriers against vaccination. Almost one-fifth of the parents (20.6%) believed that vaccination is not safe. The great majority of them preferred to vaccinate their child (93.9%), recommend vaccination to others (96.9%) and in favour of vaccination program (96.7%).

Parents` total attitude score ranged between zero and 4 (out of 4) with a mean of 3.67 and SD of 0.68.

Table (5). Factors significantly affect total parents` attitude score towards child vaccination

Variable	Total Attitude score		t-value* (p-value)
	Mean	SD	
TV (source of information)	3.57	0.78	3.68
No (243)	3.83	0.43	(<0.001)
Yes (146)			
Internet	3.60	0.74	3.71
No (304)	3.91	0.29	(<0.001)
Yes (85)			
Journals/newspapers	3.64	0.71	2.04
No (337)	3.85	0.36	(0.042)
Yes (52)			
Mother`s age	3.58	0.76	2.73
≥30 (203)	3.77	0.56	(0.007)
<30 (182)			
Father`s age	3.60	0.75	2.19
≥35(216)	3.75	0.58	(0.029)
<35 (167)			
Mother`s education	3.62	0.69	2.25
School education (272)	3.79	0.64	(0.019)
College degree (116)			
Father`s education	3.62	0.72	2.93
School education (314)	3.88	0.41	(0.004)
College degree (73)			

Table (5) presents the significant factors associated with positive parents` attitude towards child vaccination. Regarding their source of information about child vaccination, those whose source was TV showed higher significant total attitude score (3.83±0.43 versus 3.57±0.78), p<0.001. Similarly, those whose source of vaccination information was internet showed higher significant total attitude score (3.91±0.29 versus 3.6±0.74), p<0.001. Parents whose source of information was journals/newspapers showed higher significant total attitude score (3.85±0.36 versus 3.64±0.71), p<0.042. Younger mothers (<30 years) showed higher significant total attitude score towards vaccination than order (≥30 years) (3.77±0.56 versus 3.58±0.76), p=0.007. Younger fathers (<35 years) showed higher significant total attitude score towards vaccination than order (≥35 years) (3.75±0.58 versus 3.60±0.75), p<0.029. Higher educated mothers had significant higher total attitude score towards vaccination than less educated (3.79±0.64 versus 3.62±0.69, p=0.019. Higher educated fathers had significant higher total attitude score towards vaccination than less educated (3.88±0.41 versus 3.62±0.72, p=0.004.

Figure (2) shows that there was a significant positive correlation between total knowledge score and total attitude score of child vaccination (r=0.382, p<0.001).

DISCUSSION

It is widely accepted that childhood immunization programs have played a great part in the prevention of many diseases; hence, vaccination coverage is an indirect way to assess child health care from the point of view of public health.[21]

The results of the survey offer insight into the knowledge, attitude and practices with regards to immunization among the parents and their source of information and can be utilized to conduct larger community based survey in order to intervene and maintain high vaccination status of the population as the key issue in the maintenance of the existing high vaccination coverage in the KSA.

As expected, on the basis of high vaccination coverage for infants for the vaccine-preventable diseases in KSA, the attitude towards vaccination was generally positive in the present study. Over 80% of respondents were in favour of vaccination and believed that it prevents disease. This finding is in line with those reported in other countries.[22, 23] in which majority of respondents acknowledged the importance of Immunization.(24) It is also promising when one notes that the majority of the respondents were confident enough to recommend immunization to others.

It is particularly important to note that 20% of the respondent in our study believes immunization is not safe. Respondents were noted to be not well informed about possible side effects of immunization with the exception of fever and pain. Concerns about immunization safety are widely prevalent [25] as well as concerns regarding the adverse impact of possible side effects on immunization coverage have been reported earlier.[26] It is to be noted that physicians are a main source about immunization for these patients.

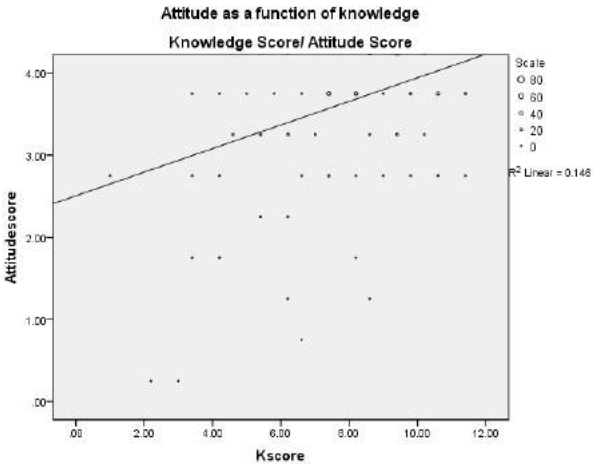


Figure (2): Correlation between total knowledge and total attitude scores

It is heartening to note that doctors are responsible for informing a majority of respondents about immunization but a need exists to work further in this area. There is a need to educate physician in this area since they are found to be deficient in knowledge about immunization.[27] The role of physician is also very important in promotion of immunization among the population.[28]

The media is noted to be a strong source for providing awareness among the respondents about immunization in the current survey where 43.7% of the respondents reported TV/radio as their source of information about child vaccination. There again exists a need for further improvement in this area. Television can be a good source to promote immunization and results of our study point out a need to further utilize this source for this purpose as better knowledge and attitude towards child immunization was reported among those depend on TV as a source of their information. The important role that media can play in promotion of immunization has been highlighted by earlier reports.[29]

A further important issue arising from the results is that 77.7% reported that a health professional was the main source of information regarding childhood immunizations. This is in contrast to

finding of UAE study where a large proportion of mothers seem to obtain information on side effects from other sources such as the media or the internet where opponents of vaccinations may invariably publish biased or unreliable interpretations of proven scientific results.[30] Unless properly addressed, this erroneous information on side effects, together with a possible diminishing perception of the lethality of vaccine preventable diseases, could adversely affect vaccine coverage.

Older mothers were less likely to have knowledge and positive attitude towards child vaccination. Perhaps, in older women, this reflects a higher prevalence of traditional nihilistic views, such as destiny being the cause of disease. The same finding has been reported in other gulf countries (UAE).[19]

It was found that the knowledge score was lower in those women with a compromised educational standard. It is a truism that knowledge increases with education. It is however, questionable whether those more informed women actually received their information from health professionals. This observation could be due to recall bias: someone who remembers being well informed also knows more about the program. For some women, the information provided may not have been targeted to their level of understanding or to their specific questions and concerns. It seems that having information from health professionals was not significantly related to knowledge level in contrast to having information from TV, internet or journals/newspapers.

In accordance with what has been reported In Iraqi study,[20] the level of knowledge among parents was positively correlated with their attitude to and practices of immunization.

Among limitations of the current research is that it was conducted in localized centres (King Abdulaziz Medical City in Riyadh, Saudi Arabia). So the generalizability of the results over Saudi community is questionable. However, adequate sample size provided enough statistical power to detect associations and yielded estimates of percentages with sufficient precision.

In conclusion, the prevalence of a positive attitude towards immunizations was excellent in this study group of parents, and satisfaction with the service was high. Knowledge on childhood immunizations however was not significantly higher in those who reportedly receive information from health professionals while it was higher among those received information from TV, internet and newspapers, although a larger percentage of the parents got their information from physicians. The knowledge of child vaccination was insufficient in some important points as side effects, situations you can't give the vaccine and that vaccination should be given for all ages. In order to maintain the current high vaccination coverage in the KSA, it is recommended that health education activities should focus particularly on parents of a compromised education and older in age and should also target their information to appropriate levels of each parent's understanding

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