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PARENTS KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING CHILDREN VACCINATION IN NORTHERN BORDER AREA (SAUDI ARABIA): CROSS SECTIONAL STUDY

Lina Eltaib, Bashaer W.Alenzi

Abstract:

Introduction: *Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.*

Objective: *Assess knowledge, attitude and practices of parents about children vaccination.*

Methodology: *A cross-sectional survey was conducted in Northern border region-Saudi Arabia for two months (December 2019, January 2020) in on random sample of 358 parents using questionnaire in Arabic language. Descriptive statistics were used to describe all variables.*

Results: *Mothers represented 57% of study subjects, the largest proportion (33%) were in the age group (36-45 years), 61% were residing in Arar. Mean score of sufficient knowledge about children vaccination was 54%, Mean score of positive attitudes toward children vaccination was 56%. Majority (92%) of study subjects vaccinate their children according to MOH vaccination schedule, 76% vaccinated their children against influenza this year. The major mentioned sources of information were; pediatrician (54%), vaccination clinic (32%).*

Conclusion: *Parents are strongly influenced by the perceived benefits of vaccination and brought their children for vaccination although their knowledge and positive attitudes to vaccination are moderate. Misconception in knowledge and attitudes about vaccination have been identified especially belief that vaccines causes autism which may contribute to vaccine hesitancy.*

Keywords: Vaccination, practice, Misconception

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INTRODUCTION:

Immunization is the process whereby a person is made immune or resistant to an infectious disease, typically by the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease.[1]

Immunization is a vital part for the proper development of the children. Immunization reduces the spreading of diseases thus protects the society from harmful diseases. Immunization plays an essential role in the children's lives as a preventive health action because it protects them from most dangerous childhood diseases.[2]Immunization process will become more successfulif the child receives full course of recommended immunization doses.[3]

Immunization is a proven tool for controlling and eliminating life threatening infectious diseases and is estimated by WHO to avert between 2 and 3 million deaths each year but anestimated 18.7 million infants worldwide are still missing out on basic vaccines[1].World Health Organization (WHO, 2016) reported that 115 million infants worldwide received Diphtheria-Tetanus and Pertussis vaccine, there is about 85% of the world's children received one dose of measles vaccine, and received polio vaccine.[4]

Around the world, The United Nations Children's Fund (UNICEF) and its partners like world health organization (WHO), Global Alliance for Vaccines and Immunizations (GAVI), the Vaccine Alliance, the united states (US) centres for Disease Control, the Bill & Melinda Gates Foundation and others including numerous non-governmental organizations jointly act to ensure that vaccines protect all children, especially those hardest to reach and most in need.[5]

Immunization prevents illness, disability and death from vaccine-preventable diseases including diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhea, rubella and tetanus.[6]

In Saudi Arabia, the main vaccinations identified by the Ministry of Health in the Vaccination schedule, from birth to entering the first primary grade, aims to protect children in the Kingdom from diseases targeted by immunization, to keep the Kingdom free of polio, as well as getting rid of measles, rubella, mumps, in addition to reducing the infection with any of these diseases.

RATIONALE OF THE STUDY

Although that vaccinations in mandatory in Saudi Arabia and the Ministry Of Health have released an application to remind parents about their children appointments for vaccination, but still there are some parents do not follow the schedule and do not attend at the appropriate dates, and they do not understand completely the importance of vaccines to their children except for official documents completion.

During the past few years, physicians in the kingdom were facing a growing number of parents who are questioning the safety and necessity of routine childhood vaccination because of some myths and misconceptions about vaccination.

The belief that vaccines causes autism was the most prevalent parental concern in a survey conducted in USA.[7]According to the global immunization division CDC report, the global parental Attitude and Knowledge regarding immunization services was low and parents have negative beliefs about measles and vaccination programs[8].

Therefore, parents' knowledge and attitude play an important role in achieving complete Immunization of their children.

STUDY OBJECTIVES:

Primary objectives:

- To explore the knowledge and awareness of Saudi parents in Northern Border Area regarding children vaccination
- To explore attitude of Saudi parents in Northern Border Area regarding children vaccination
- To determine Saudi parents' views and practice with regards to children vaccination.

Secondary objective:

- To assess patient's beliefs about the relationship between vaccination and autism disease.

LITERATURE REVIEW

Parents' knowledge about immunization and their attitudes towards them are likely influence uptake[9]. Previous studies revealed misconceptions on parents' knowledge and negative attitudes towards childhood immunization. Mothers' knowledge about vaccination was found to be quite low and their educational status was significantly associated with child's coverage[10].Negative attitude, for example mothers fear from vaccination, was found to be significantly affected the immunization status of their children[11]. Zagminas et al.[12] assessed parents' knowledge on immunization and noted that most of the respondents can be characterized as having a positive opinion about vaccination, although 20-40% of respondents indicated insufficient knowledge on this issue. Greater concern about the safety of vaccines was expressed by older parents, residents of towns and highly educated individuals[13].On the other hand researchers in

developed world found parents' attitudes and beliefs had little effect on their children's immunization levels[14].

In the study of Farha Azmi and Dr. Ratna Prakash who assessed the knowledge of immunization among mothers of under-5 children of Uttar Pradesh state. Their results indicated that most of the mothers of under-5 children have poor knowledge of immunization. [15]

Mohitulameen Ahmed Mustafi and Dr. Mir Mohammad Azad examined the factors like socioeconomic, demographic, cultural, community and behavioral affecting the rate and status of immunization of children under five years in Bangladesh. Their analysis concluded that the children who have chances of getting full immunization are the children whose parents are educated, service holders, children of respondents who had no work, current age of respondents whose age is 21-30 years , highest education level of respondent, the respondents who had used tube well water and children who come from better economic status households. [3]

In India, Abhishek Kumar and Sanjay K. Mohanty examined the socio-economic differentials in coverage of basic childhood immunization. They have used bivariate, multivariate analysis and progression rate to understand the differentials and changes in child immunizationduring the period between 1992-2006. All three rounds have covered 99% of India's population. Full immunization increased from 35% in 1992-93 to 44% in 2005-06, partial immunization increased from 35% to 51 % and a decline in no immunization from 30% in 1992-93 to 14% in 1998-99 and 5% in 2005-06. Special effort is needed for the coverage of diphtheria, tetanus, pertussis and measles vaccines as coverage of these vaccines is lower as compared to polio. [16]

M. Mamatha and V. Nageswara Rao explored the vaccination coverage among children aged 0-9 months. Their results indicated that out of total population, 12.4 % are still not been vaccinated. Non-utilization of vaccines is found to be 9.1 % among the total urban and 14.2 % among the total rural population. The non-coverage rate of vaccines is observed to be somewhat high in female children i.e. 12.9 % than their male counterparts i.e. 12 %.[17]

Bhuwan Sharma et. al. used WHO's 30 cluster sampling method for the evaluation of immunization coverage and selected seven subjects between age group of 12-23 months from each of 30 clusters to examine the role of socio demographic variables on immunization coverage. They have final sample size consists of 210 children. In their study area, 170 (81 %) children received complete immunization, 37 (17.6 %) children received partially immunization and 3 (1.4 %) children did not receive any type of immunization. The coverage of Bacillus Calmette–Guérin (BCG) dose was found highest (97.1 %) while Hepatitis was lower than that of Oral poliovirus vaccines (OPV) and diphtheria, pertussis and tetanus (DPT). Measles coverage is also less than 90 %. The major reasons of low vaccination coverage were children illness, lack of knowledge, low education of mother, high birth order and place of delivery. [18]

In a previous study conducted to examine the relationship between child immunization of children aged 12-23 months and household socio-demographic characteristics in Pakistan. Danish and Ayaz Muhammad applied chi-square test and logistic regression on the household level data from Pakistan Social and Living Standard Measurement Survey. In their conceptual framework, child immunization is considered as dependent variable while the gender, parents' education, area and province or region are taken as independent variables. The sample size for all provinces has been fixed at 76546 households selected from 5413 sample villages or enumerated blocks. Their results showed that the male children are more immunized as compare to female children, people in urban area more likely to immunize their children as compare to people in rural area. In case of child immunization, not only child's age but also child's gender, resident of the child, parents education, household income, family size plays an essential role. [19]

Rachna Kapoor and Sheetal Vyas examined the awareness and knowledge of mothers of under five children regarding immunization in Ahmedabad. The primary sources of knowledge of mothers about vaccine preventable diseases were anganwadi workers and television. In their crosssectional descriptive study, 85% of the women were aware of poliomyelitis, 15% women were aware of Hepatitis B and 10% women were aware of pertusis as a vaccine preventable disease. [20]

A. Jisy Jose et. al. observed the awareness on immunization among mothers of under five children with non-experimental exploratory survey. They have collected the data by usingquestionnaire and found that 30% of mothers have poor knowledge of immunization while 43.4 % had average knowledge, 23.4 % had good knowledge and 3.33 % mothers had excellent knowledge of immunization. They have concluded on the basis of their result that there was a significant association between knowledge and exposure to mass media in relation to immunization among mothers of under five children. [21]

Rahul Sharma and Sanjiv K Bhasin assessed the knowledge about routine immunization among caretakers of young children. In their cross-sectional study, 682 caretakers accompanying children under 5 years were considered and proportions and chi-square test have been applied for the results. Out of 682 caretakers, only 268 caretakers were aware of three diseases covered under routine immunization. They concluded that there is an urgent need to aware caretakers about routine immunization. [22]

Payyappat Sabin Shivan et. al. worked on a project named as Pre-Baby vaccination to provide vaccination notifications and reminders as SMS to the families of newborn and pregnant women at regular intervals by using their registered id. In the proposed system K-means clustering algorithm has been used and the families can access the static information send by the system as a notification periodically.[23]

METHODOLOGY:

3.1. Study design and duration

A cross-sectional survey was conducted for two months (December 2019, January 2020) in Northern Border Area (Saudi Arabia).

3.2. Study population and sampling

Random sample of parents invited to participate in the study and participation is optional. of 358 of parents agreed to participate in the survey.

3.2.1 Inclusion criteria

The Inclusion criteria for this study isto be:

- The mother or father for a child
- Age is 18 years or more
- To accept to participate in the survey after being informed about the main purpose of the study.

3.3. Data collection and data collection tool

Data was collected by using online and paper structured questionnaire in Arabic language.

The questionnaire (attached in the appendix) was in Arabic language and composed of three parts:
(I) Sociodemographic characteristics of the participants (e.g. age, place residence, number of children, nationality, educational level, job)
(II) Items concerning knowledge about vaccination
(III)Items concerning attitude and practice toward child vaccination
(IV) Items concerning attitude and practice toward child vaccination
(V) Items concerning side effects of vaccination and source of information regarding children vaccination

3.4. Data processing and statistics

Data was processed using the software Microsoft Excel. Descriptive statistics were used to describe all variables. Frequency and percentage calculated for all variables with representation of variables with either bar graph or pie chart.

RESULTS:

4.1 Participants' demographics

Totally, 358 study subjects agreed to participate and answered the questionnaire. Among them, the mothers represented 57%, the largest proportion (33%) were in the age group (36-45 years), 61%were residing in Arar, 95% Saudi, 34% and 35% of fathers and mothers respectivelycompleted secondary education, 66% and 84% of mothers and fathers respectively were employee and 27%had three children.
(Details of demographic characteristics of study subjects represented in table 1)

4.2. Study subject's knowledge about vaccination

66% of study subjects had sufficient were aware that routine vaccination protects children against infectious diseases and their complications, 46% were aware that vaccination don't help in children growth, 42% were aware that vaccination not help in curing from some diseases, 56% were aware that children vaccination is not harmful for children, 68% were aware that children are given frequent doses of the vaccine separated by definite specific times to constitute their immunity, 48% were aware that giving more than one vaccine to the child at one time doesn`t harm his/her immunity , 46% were aware that vaccinations are not harmful, 48% were aware that vaccine can be given if the child has cold or flu, 40% were aware that otitis media and diarrhea are not contraindications to vaccination , 70% were aware that it is preferred to give children seasonal influenza vaccine , 64% were aware that it is necessary to vaccinate children during vaccination campaigns such as polio campaigns, 61% were aware that influenza vaccine's effect lasts for only one year, 56% were aware that influenza vaccination is recommended in September of each year, 43% were aware that vaccine hasn't dangerous side effects. Mean score of sufficient knowledge about children vaccination was 54%. (Details of study subjects' knowledge about vaccination represented in table 2)

4.3. Attitudes of study subjects toward children vaccination

More than two thirds (66%) of study subjects agreed that vaccinations are important to keep child`s health, 55% agreed that vaccination may lead to autism, 61% agreed that compliance with the MOH vaccination schedule is very important and 52% agreed that vaccines given in private hospitals are superior compared to those given in

government hospitals. Mean score of positive attitudes toward children vaccination was 56%. (Details of study subjects' attitudes toward children vaccinations represented in table 3)

4.4. Practices of study subjects toward child vaccination

Majority (92%) of study subjects vaccinate their children according to MOH vaccination schedule, 89% knew the next date for their child vaccination, 76% vaccinated their children against influenza this year and 59% consider the doctor's counselling is the most important factor for selection of vaccine. (Details of practices of study subjects toward child vaccination in table 4)

4.5. Source of information about children vaccination

88% of study subjects reported that they have sufficient information about vaccination, the major mentioned sources of information were; pediatrician (54%), vaccination clinic (32%). (Table 5)

4.6. Side effects experienced by children due to vaccination

The study subjects reported fever (76%) is the most common side effect occur due to vaccination followed by swelling in injection site (16%) and pain (16%). (Table 6)

Table 1. Demographic characteristics of study subjects. (n=358)

Variable	Categories	Frequency	Percentage (%)
Participant	Mother	203	57%
	Father	155	43%
Age	18-25 years	56	18%
	26-35 years	111	31%
	36-45 years	118	33%
	46-55 years	47	13%
	56-65 years	13	4%
	More than 65 years	4	1%
Educational degree of father	Not completed secondary education	76	21%
	Secondary education	123	34%
	Diploma	54	15%
	University education	86	24%
	Master or doctorate	19	5%
Educational degree of mother	Not completed secondary education	70	20%
	Secondary education	127	35%
	Diploma	59	17%
	University education	89	25%
	Master or doctorate	13	4%
Nationality	Saudi	340	95%
	Non-Saudi	18	5%

Residence area	Arar	217	61%
	Rafha	78	22%
	Turif	32	9%
	Al uwayqilah	17	5%
	Gudayyida-arar	10	3%
	Shobah	4	1%
Number of children	1	47	13%
	2	53	15%
	3	98	27%
	4	76	21%
	5	33	9%
	6	23	6%
	More than 6	28	8%
Mother is working	Yes	238	66%
	No	120	34%
Father is working	Yes	301	84%
	No	57	16%

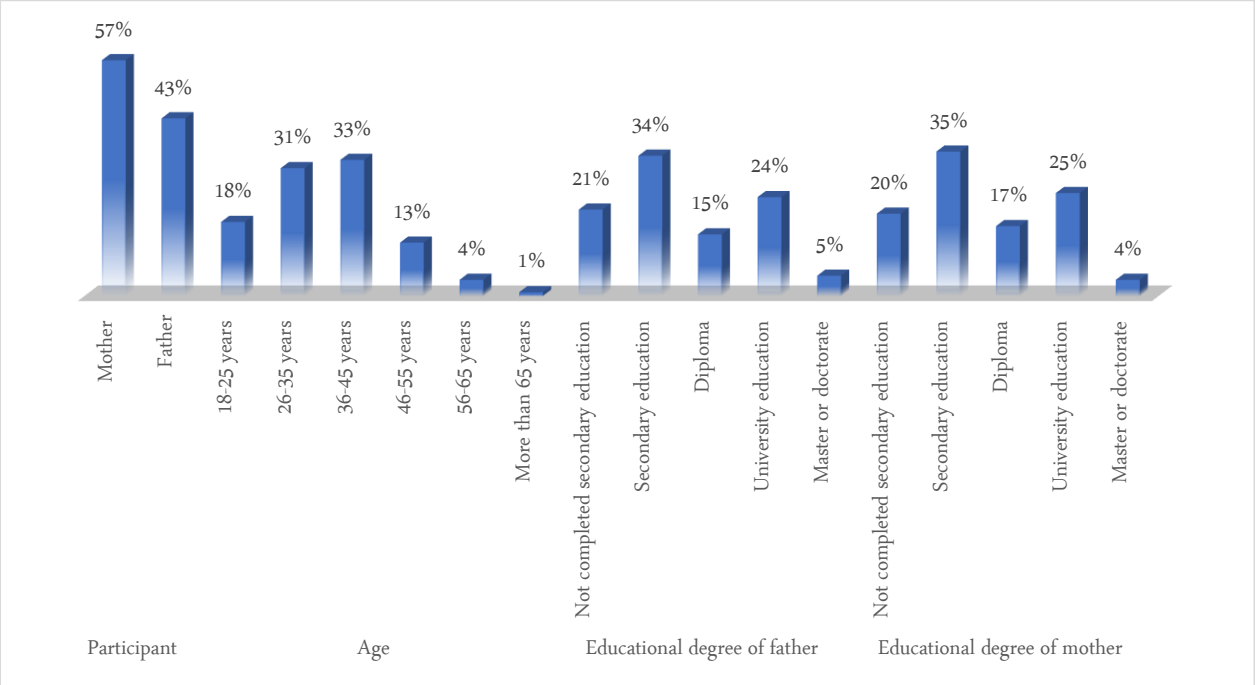

Figure 1 (a). Demographic characteristics of study subjects.

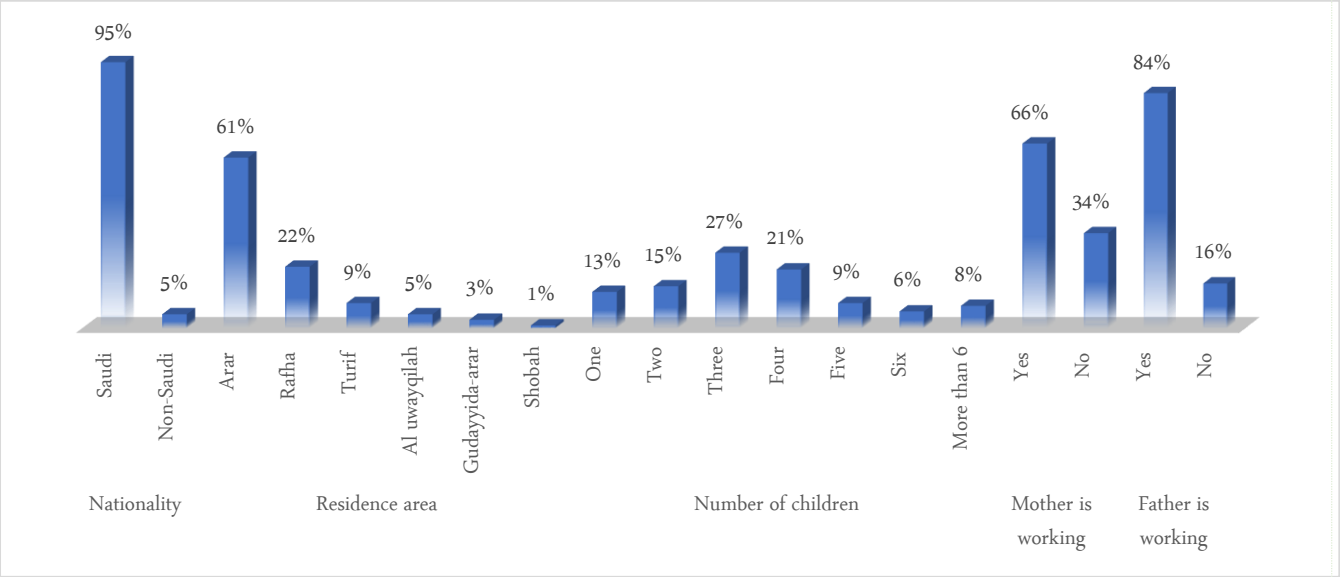

Figure 1 (b). Demographic characteristics of study subjects.

Table 2. Study subject's knowledge about vaccination

(n=358)				
Statement	**Sufficient knowledge**		**Insufficient knowledge**	
	Frequency	**%**	**Frequency**	**%**
Routine vaccination protects children against infectious diseases and their complications	236	66%	122	34%
Vaccination help in children growth	164	46%	194	54%
Vaccination help in curing from some diseases	149	42%	209	58%
Children vaccination is not harmful for children	202	56%	156	44%
Children are given frequent doses of the vaccine separated by definite specific times to constitute their immunity	244	68%	114	32%
Giving more than one vaccine to the child at one time doesn`t harm his/her immunity	173	48%	185	52%
Some vaccinations are harmful	164	46%	194	54%
Vaccine can be given if the child has cold or flu	173	48%	185	52%
Otitis media and diarrhea are not contraindications to vaccination	145	40%	213	60%
It is preferred to give children seasonal influenza vaccine	252	70%	106	30%
It is necessary to vaccinate children during vaccination campaigns such as polio campaigns	228	64%	130	36%
Influenza vaccine's effect lasts for only one year	217	61%	141	39%
Influenza vaccination is recommended in September of each year	202	56%	156	44%
Vaccine has dangerous side effects	153	43%	205	57%
Mean	193	54%	165	46%

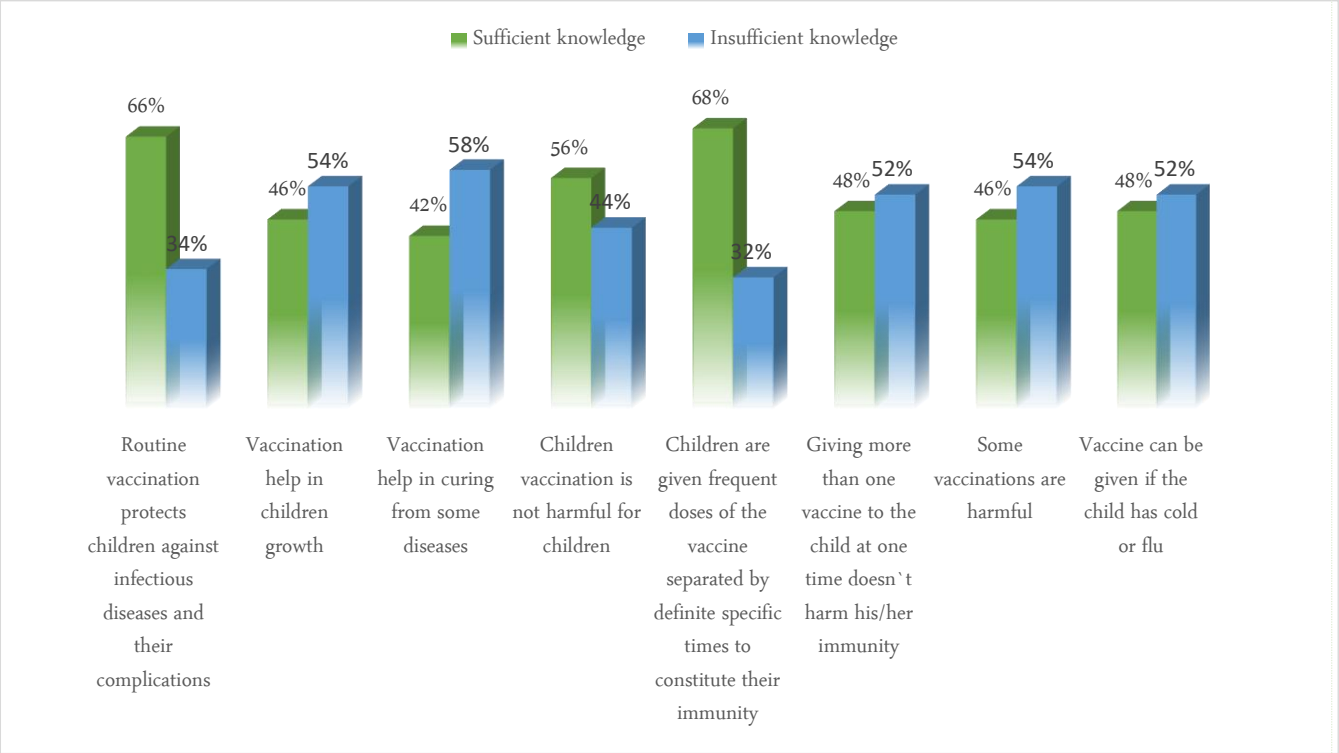

Figure 2 (a). Study subject's knowledge about vaccination

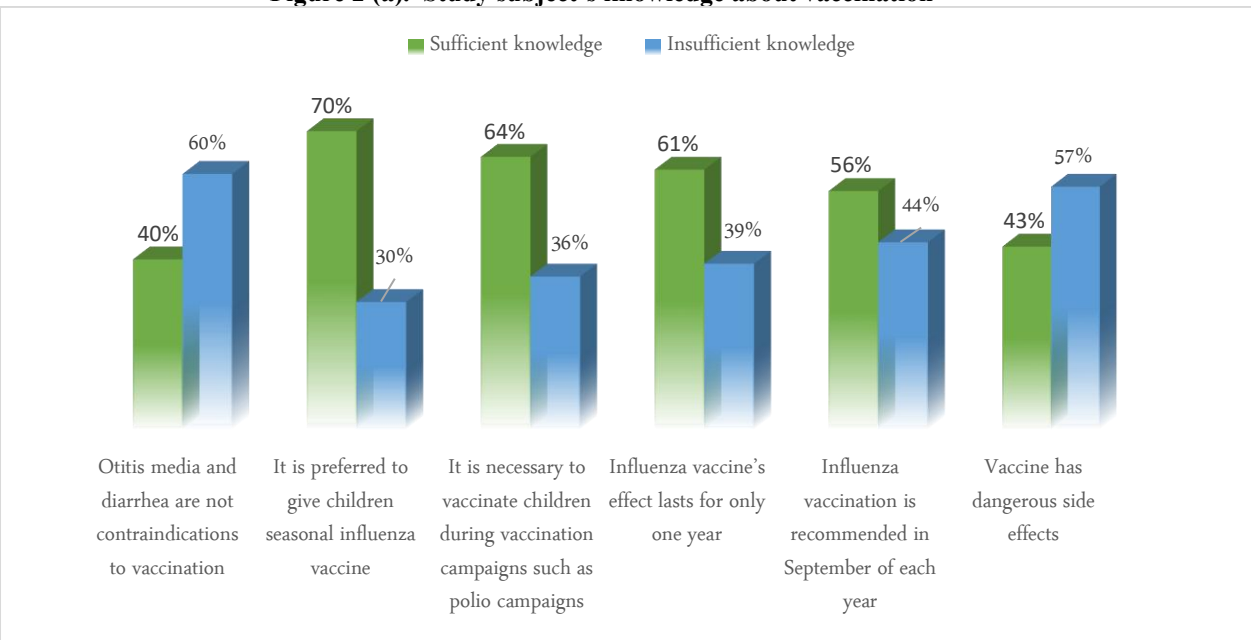

Figure 2 (b). Study subject's knowledge about vaccination

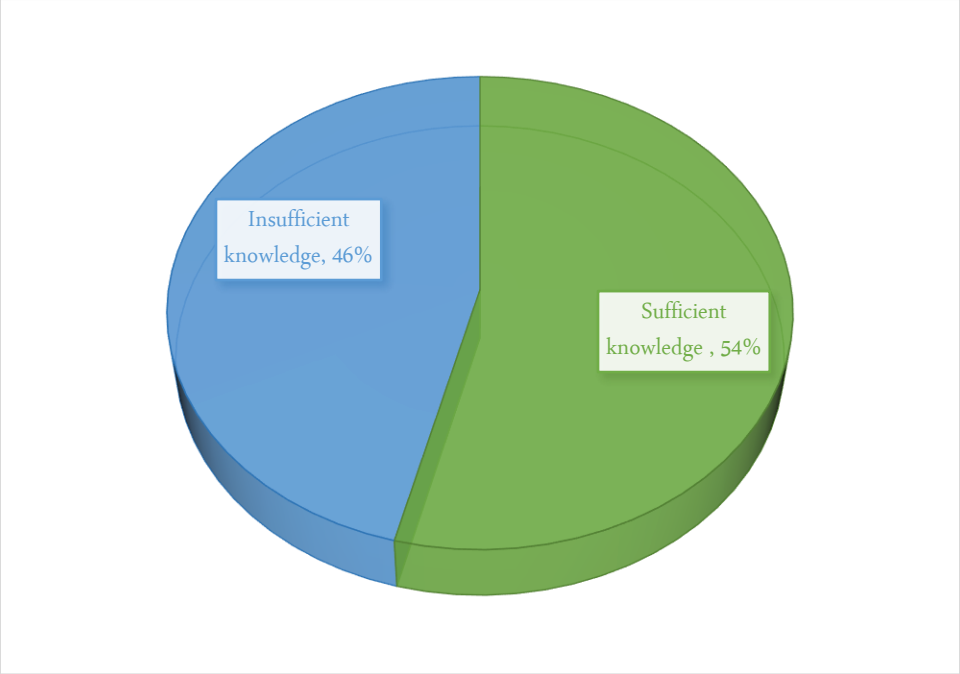

Figure 2 (c). Mean score of study subject's knowledge about vaccination

Table 3. Attitudes of study subjects toward children vaccination

(n=358)				
Statement	**Positive attitude**		**Negative attitude**	
	Frequency	**%**	**Frequency**	**%**
Vaccinations are important to keep child`s health	238	66%	120	34%
Vaccination may lead to autism	162	45%	196	55%
Compliance with the MOH vaccination schedule is very important	217	61%	141	39%
Vaccines given in private hospitals are superior compared to those given in government hospitals	185	52%	173	48%
Mean	200	56%	158	44%

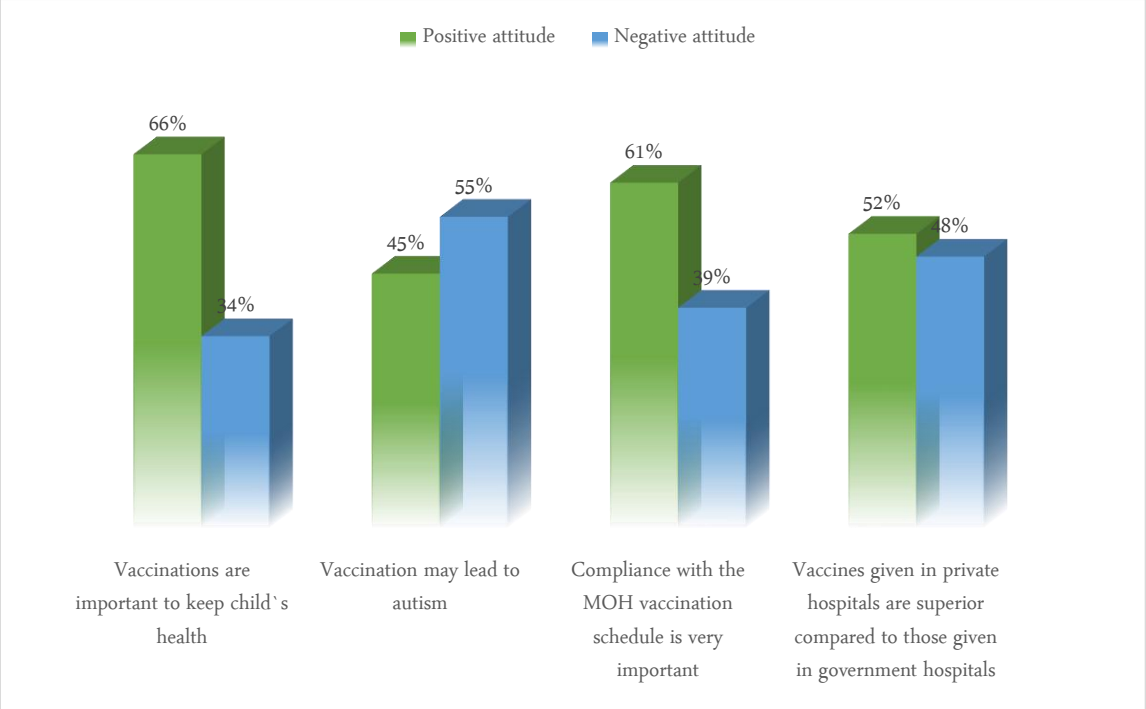

Figure 3 (a). Attitudes of study subjects toward children vaccination

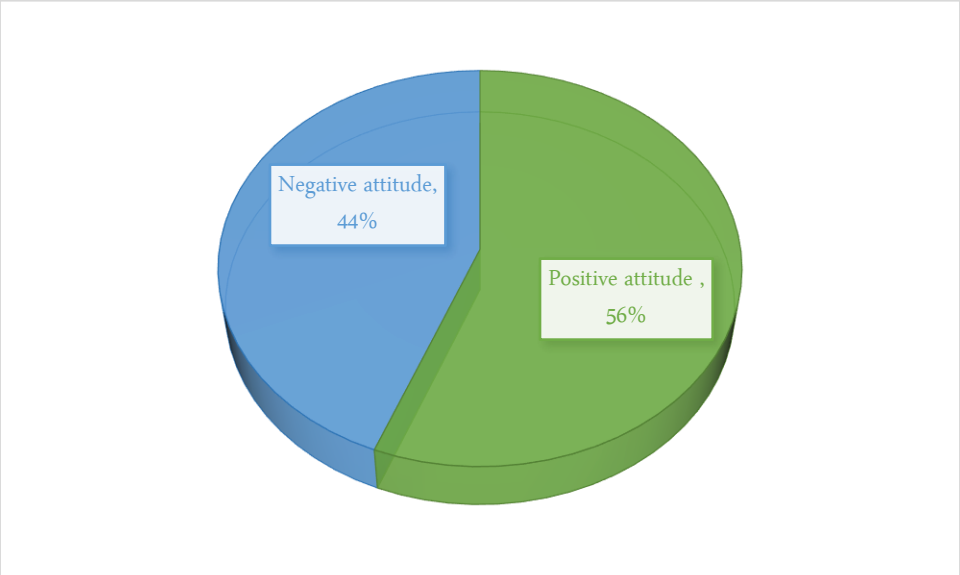

Figure 3 (b). Mean score of attitudes of study subjects toward children vaccination

Table 4. Practices of study subjects toward child vaccination (n=358)

Statement	Categories	Frequency	Percentage
Your child is vaccinated according to MOH vaccination schedule	Yes	328	92%
	No	30	8%
Do you know the next date for your child vaccination	Yes	318	89%
	No	40	11%
Have your child vaccinated against influenza this year	Yes	273	76%
	No	85	24%
Most important factor for the selection of a vaccine	Doctor's counselling	210	59%
	Cost of the vaccine	100	28%
	Advertisement	17	5%
	Knowledge about it	31	8%

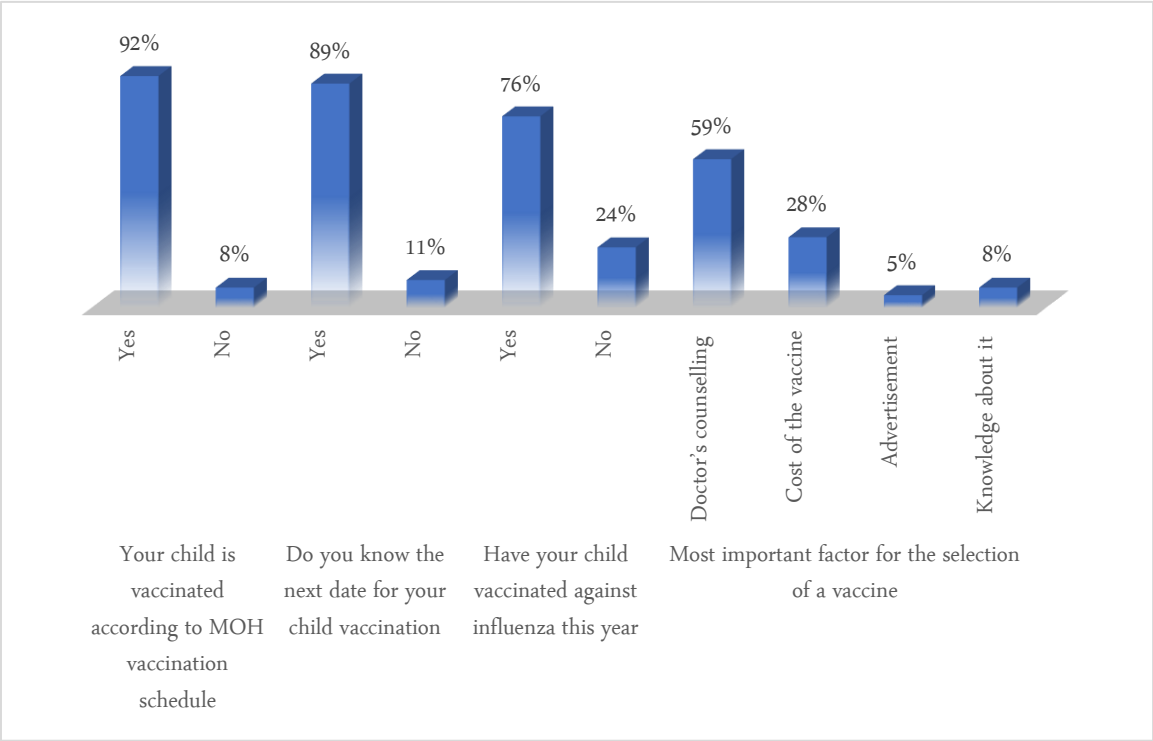

Figure 4. Practices of study subjects toward child vaccination

Table 5. Sources of information about study child vaccination

(n=358)			
Statement	**Categories**	**Frequency**	**Percentage**
Do you have sufficient information about vaccination ?	Yes	317	88%
	No	41	12%
Source of information	Pediatrician	183	54%
	Vaccination clinic	108	32%
	Friends	22	6%
	Books and magazines	4	1%
	TV, internet	23	7%

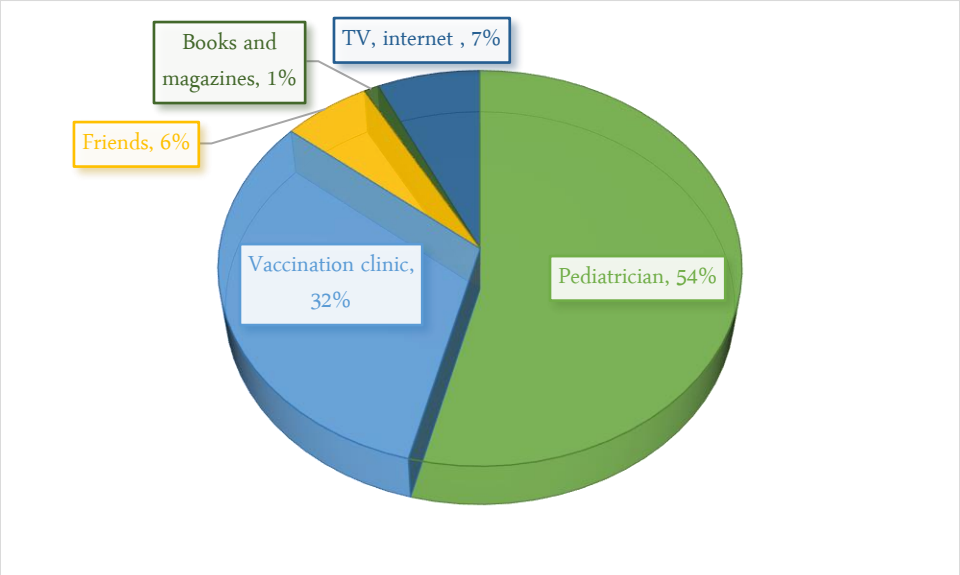

Figure 5. sources of information about study child vaccination

Table 6. Side effects experienced by children due to vaccination

(n=358)		
Side effects	**Frequency**	**Percentage**
Fever	272	76%
Swelling in injection site	46	13%
Pain	46	13%
Crying, irritability	38	11%
All	57	16%

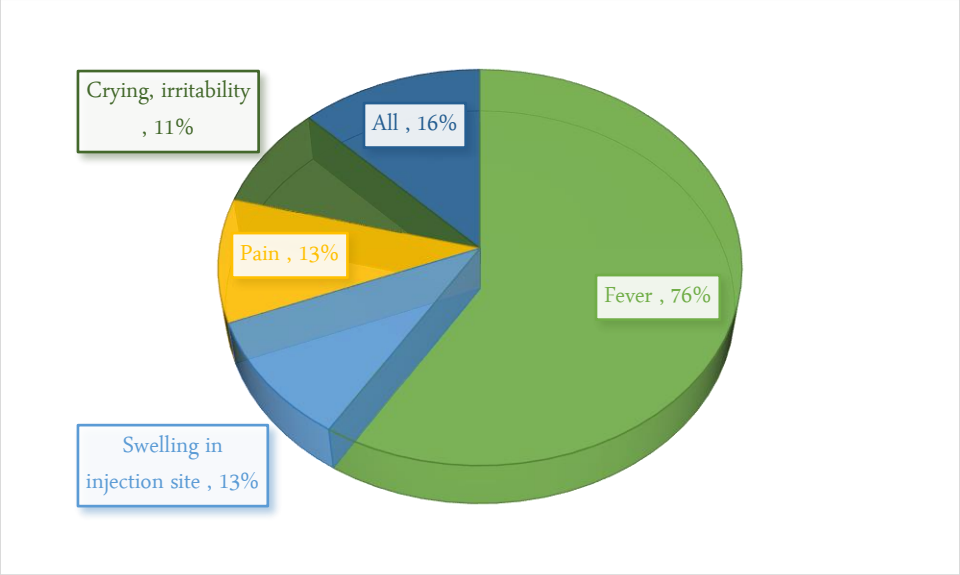

Figure 6. Side effects of vaccination reported by study subjects

DISCUSSION:

The present study was conducted to assess knowledge, attitude and practices of the parents toward children's vaccination in Northern Border Region –Saudi Arabia. Mothers participated more than fathers in the study (57%) vs (43%) which is consistent with other previous studies which may be attributed to the responsibility of mother for following up children health and taking children to health care facilities. [24,25]

Some misconceptions revealed in the participants knowledge about vaccination; 52% of participants considered vaccination is not possible when child has cold or flu and 60% considered otitis media and diarrhea as contraindications to vaccination. These findings indicate the need for more education directed to the parents to overcome missing vaccination due to these minor illnesses. [26]

It is known that parental knowledge regarding child vaccination impacts their practice in this regard [27]. Favin, et al. [28] showed in their study that lack of knowledge about the importance of child vaccination vaccines was one of the main barriers to vaccinate their children. In the present study, more than two thirds (66%) of parents agreed that routine vaccination protect children against infectious diseases and their complications which is lower than reported by another study carried out in India [29] were 70% of parents believed that immunization prevents some infectious diseases while the other 30% of parents did not know this fact.

The results indicated that the large percentage (92%) of the children for parents participated in the study were vaccinated according to MOH vaccination schedule. This is consistent with what was reported in previous study conducted in AlMadinah- Saudi Arabia where 92.8% of the children were vaccinated according to MOH vaccination schedule [30] but higher than that reported from a study carried out recently in India (86%).[31]This higher rate could be attributed partially to the parents` knowledge that vaccination is mandatory and required for school registration.

The present study results revealed that the mean score of parent's knowledges about vaccination is moderate (54%) which is higher compared to another previous study indicated that only one third of mothers had adequate knowledge about children vaccination [32] which indicate that there is no association between parent's knowledge and their practices toward vaccination as reported in other studies[33-35] and that public accept vaccination despite limited knowledge about it [33,36]. This was attributed to the fact that although parents resist vaccination, they want to protect theirchildren from harm.[33]

Montasser et al. have shown that provision of information about a disease, its adverse sequelae and the effectiveness of the vaccine have been shown to improve uptake of vaccines.[36]Large proportion of the parents in the present study (61%) believed that compliance with the MOH vaccination schedule is very important. A higher percentage (96%) has been reported in other studies carried out by Joseph et al. and Bernsen et al. [37]

Most of the parents included in this study (68%) knew that children were given frequent doses of the vaccine separated by definite specific times to constitute their immunity. In another study carried

out in Taif city, Saudi Arabia [24], only 41.6% of the parents correctly knew the importance of administration of multi-doses of the same vaccine given at intervals for child immunity. The consequence of this finding is that parents may think that only the first shot of the vaccine is sufficient to develop immunity and protect their children. The difference between these studies could be attributed to difference in socio-cultural background of the study population.

It has been reported by Nichter that the attitudes of parents are more strongly influenced by the perceived benefits of vaccination or by the perceived risks of not being vaccinated.[33] In the present study, large percentage of parents agreed that vaccinations are important to keep child`s health, benefits of vaccinations exceed their harms, and child vaccination is safe and not harmful. However, almost 57% of them also agreed that vaccine has dangerous side effects. This would emphasizethe fact that other factors such as trust in health-care providers and culture may be more influential factors than knowledge and attitude.[38]

Majority (76%) of parents in the present study vaccinate their children against seasonal influenza. Therefore, they might be motivated to vaccinate their children if educated about the important role of children in transmitting the infection in households and communities, beside the economic and health burden of contracting influenza.[39]

The major mentioned sources of information were; pediatrician (54%), vaccination clinic (32%) which is consistent with results of other studies conducted in India and Egypt.[31,40]This finding suggests a great responsibility of medical staff (physicians and nurses) not only in giving vaccines but also in educating parents toward better health care practices.

However, In the present study, 7% of participants got their information about child vaccination from TV and internet which emphasizes the role played by TV in alerting parents regarding child vaccination in our community. Similar result has been reported in other studies carried out in Saudi Arabia and India.[41,42]

Possible connections between immunization and developmental disorders, most notably autistic disorders, have been the subject of a great deal of debate and have caused much concern for parents who want to make the safest choices for their children. 55% of study subjects in the present study believe that vaccination may lead to autism. However, there is definite evidence that the vaccinations currently given to the children are safe, evidence that early signs of autism are present during infancy, before obvious symptoms are noticed, indicates that the onset of autism occurs well before vaccination, the risk of autism being triggered by MMR vaccine is not currently well supported by sound, scientific data.[43] This finding indicates the need to improve parents' wrong views about the relation between vaccination and autism.

LIMITATION OF THE STUDY

This study has some limitations, it was conducted on small sample and only in one region in Saudi Arabia; therefore, the obtained results cannot be generalized to the parents in all the country. Future researches on the topic need recruitment of parents from different areas in the country.

CONCLUSION AND RECOMMENDATION:

Parents are strongly influenced by the perceived benefits of vaccination and brought their children for vaccination although their knowledge and positive attitudes to vaccination are moderate. Misconception in knowledge and attitudes about vaccination have been identifiedespecially belief that vaccines causes autismwhich may contribute to vaccine hesitancy. The sources of information identified in this study highlight that medical professionals need to be more engaging in this despite their busy schedules at vaccination clinics.

Failure to immunize constitutes a well-known and extremely high risk for all children. All possible efforts must be made to protect children from devastating infectious diseases. Awareness campaign are recommended to increase knowledge and improve the attitude of parents to keep health of children for healthier community.

Further research on belief that vaccines causes autism is needed.

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