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RESEARCH ARTICLE

CHILDHOOD VACCINATION IN AL-MADINAH , SAUDI ARABIA. THE EFFECTS OF PUBLICKNOWLEDGE AND ATTITUDES.

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Abstract

Childhood vaccination prevents 2 million deaths per year worldwide and is widely considered to be 'overwhelmingly good' by the scientific community .Immunization prevents illness, disability and death from vaccine-preventable diseases including diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhea, rubella and tetanus .

Parental decisions regarding immunization are very important for increasing the immunization rate and compliance and for decreasing any possible immunization errors. Parents' knowledge and practices regarding immunization are the major factors that contribute to their vaccination decisions .So this study aimed to increase public awareness and attention about the importance of childhood vaccination and its rule on preventing a serious groups of disease and the risks of non-vaccination .

In this study we detected the parents fears,opinions and knoldge regarding vaccine and its possible side effects . also, to identify the causes of un-vaccination in the same population

The study population includes all Al-Madinah population, whose ages between (20- 60) years old, mothers, fathers and single ones, a random sample of (300) persons were selected, they answered the electronic questionnaire, (55) of them were excluded based on the exclusion criteria, then the sample consisted (245) person .

Results of the present study showed that parents in Al-Madinah , Saudi Arabia have had good knowledge and positive attitudes on most of aspects related childhood immunization.The most of participants rise in temperature after taking the vaccination is one of the symptoms that indicate the effectiveness of vaccination and immunity of the child. Scientifically vaccines help develop immunity by imitating an infection the imitation infection can cause minor symptoms, such as fever.

Background and Introduction:-

Immunization has greatly reduced the burden of infectious diseases (1),

Childhood vaccination prevents 2 million deaths per year worldwide and is widely considered to be 'overwhelmingly good' by the scientific community (2). Immunization prevents illness, disability and death from

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vaccine-preventable diseases including diphtheria, measles, pertussis, pneumonia, polio, rotavirus diarrhea, rubella and tetanus (3) .

Parents' knowledge about immunization and their attitudes towards them are likely influence uptake (4) .

Negative attitude, for example mothers fear from vaccination, was found to be significantly affected the immunization status of their children (5) .

An increasing number of parents are questioning the safety and necessity of routine childhood immunizations . The belief that vaccines cause autism was the most prevalent parental concern in a survey conducted in USA (6) .

Vaccination coverage has now reached a plateau in many developing countries, and even where good coverage has been attained, reaching children not yet vaccinated has proved difficult (7). Thus, there is an urgent need to find ways to increase vaccination coverage and particularly to encourage parents to have their children vaccinated. In our study we try to know if there is any concerns or wrong information about childhood vaccination and the critical rule they represent in the vaccination cycle by a simple survey study among Al-Madinah population in people whom are married or at the age of marriage in the same community.

Literature Review:-

A cross-sectional survey was conducted during the period of one month (April 2013) in Taif, Saudi Arabia. Convenient method of sampling was adopted. Parents with children of 0-12 years old were invited to participate. Verbal informed consent was obtained and participation was optional.

he majority of parents 672 (91.9%) knew the role of routine vaccination in protecting children from some infectious diseases and its complications. A considerable number of 635 (86.9%) parents knew the timing of the first dose in vaccination schedule. Five hundred and sixty eight parents knew that the incidence of most diseases against which children are vaccinated occur during the first years of life. Less than half of the interviewees 304 (41.6%) knew that administration of multiple doses of the same vaccine is important for child immunity. More than one third of the parents knew that concomitant administration of multiple vaccines have no negative impacts on child immunity. Nearly three quarter of the parents agreed with the importance of vaccinating children during immunization campaigns. Out of the total parents 334 (45.7%) agreed that it is recommended to vaccinate children against seasonal influenza and 512 (70%) denied that there is association between immunization and autism (8)

A study in Malaysia revealed that Seventy-three parents were enrolled in this study; the majority were mothers ($n = 64$, 87.7%). Parents' knowledge about childhood immunization increased significantly after the intervention compared to the baseline results ($p < 0.001$). There were significant differences between parents' knowledge and their educational level and monthly income ($p < 0.001$ and $p = 0.005$), respectively
A short educational intervention designed for parents had a positive effect on their knowledge about immunization. Educational interventions targeting parents with low levels of education and income are needed. Further studies investigating the actual effectiveness of such interventions on immunization rates and statuses are required (9) .

A National telephone survey held in the united states resulted in Eighty-seven percent of respondents deemed immunization an extremely important action that parents can take to keep their children well ,25% believed that their child's immune system could become weakened as a result of too many immunizations and 23% believed that children get more immunizations than are good for them (10) .

Another study on Parents of children resident in the London Borough of Hackney revealed that :Measles, mumps, rubella (MMR) and meningococcal C were most frequently omitted, usually because of concerns about vaccine safety. Twenty-three out of 68 respondents perceived that having their child immunized with a particular vaccine was more risky than non-immunization, particularly for MMR and meningococcal C vaccines. Those who agreed to be interviewed were notably concerned about the MMR vaccine, but not immunization in general. They perceived the information provided by health professionals to be poor (11).

The balance between the risks and benefits to a given individual favors immunization most strongly when rates of immunization in the community are low and disease prevalence is high. In most cases, however, as immunization rates increase and disease prevalence decreases, the balance may tip the other way (12)a retrospective cohort study

investigated the immunization status against pertussis among 1-year-old children in Utah revealed that Accurate parental knowledge about the relative risks of vaccination and illness was associated with a greater likelihood for immunization. Although some parents chose to forego the vaccination because they were concerned about its side effects, the most common reason for incomplete immunization was illness at the time the vaccination was to be given. If immunization rates are to improve, health care professionals must not only make an effort to educate the general population regarding the vaccine, but they must also ensure immediate follow-up for immunization when the procedure is delayed. (13)

A cross sectional survey of nonrandomized sample of 200 mothers were interviewed at primary health care clinic at Al-Beida City coming for vaccination of their children in a period from first to 31 August 2008 that concluded The child's gender, education, residence and job of the mother did not affect the pattern of immunization, while negative attitude (mothers afraid from vaccination) significantly affected the immunization status. This signifies the incomplete knowledge and inappropriate practice of the people. Extra effort is need to raise the knowledge and break the old beliefs of the people. Appropriate information dissemination, aggressive campaigning and family involvement are crucial to the success of the programme (14).

An Internet-based survey focusing on parental vaccine safety concerns and potential vaccine risk communication strategies was sent to all members of the Kentucky Chapter of the Amerian Academy of Pediatrics. Resulted in : There were 121 respondents who routinely administered childhood vaccines. Of these, 85% reported parental concern about the combined measles-mumps-rubella (MMR) vaccine. Concerns about the influenza and human papillomavirus (HPV) vaccines were also frequent. Of the respondents, 46% noted parental skepticism about all vaccines in general. However, refusal of all vaccines was uncommon in most practices (median 1%, interquartile range 1%-3%). The belief that vaccines cause autism was the most prevalent parental concern, reported by 70% of pediatricians. Physicians also reported that a list of reliable vaccine information Websites and pamphlets addressing common vaccine safety concerns would be the most helpful materials to use during their discussions with concerned parents (15).

Objectives:-

1. To asses the general knowledge about the importance of childhood vaccination among Madinahpopulation .
2. To identify the causes of un-vaccination in the same population .
3. To identify the general knowledge about the risks of un-vaccination.
4. To identify the general knowledge about the side effects of vaccination.

Population & Sample of the Study:-

The study population includes all Al-Medena population, whose ages between (20- 60) years old, mothers, fathers and single ones, a random sample of (300) persons were selected, they answered the electronic questionnaire, (55) of them were excluded based on the exclusion criteria, then the sample consisted (245) person, the next table shows their properties according to their personal information:

Table 1:-The participants personal data.

Personal Data		*#*	*%*	*P-value*
Gender	Male	75	30.6	0.00**
	Female	170	69.4	
Age	20 to 30	172	70.2	0.00**
	31 to 40	38	15.5	
	41 to 50	27	11.0	
	51 to 60	8	3.3	
Marital status	Single	129	52.7	0.406
	Married	116	47.3	
Number of children	One	32	13.1	0.00**
	2 - 3	33	13.5	
	More than 3	43	17.6	
	Nothing	137	55.9	
Age of your youngest children (if found)?	Less than a year	21	18.1	0.137
	From 1 to 2 years	25	21.6	
	From 3 to 6 years	28	24.1	

	More than 6 years	42	36.2	
Residence place	Al Medena	215	87.8	0.00**
	Out of Al Medena	30	12.2	
living place	Popular	4	1.6	0.00**
	Apartment	136	55.5	
	Villa	105	42.9	
Education level	University degree	212	86.5	0.00**
	Secondary	25	10.2	
	Prep. School	8	3.3	
Income	1000 - 3000	61	24.9	0.00**
	3000 - 6000	26	10.6	
	6000 - 10000	66	26.9	
	More than 10000	92	37.6	

****Chi Square test - Significant at the 0.01 level.**

It is clear from the previous table that 69.4% of the participants were females, while 30.6% of them were males, their ages were between (20- 60) years old, 70.2% of them were between (20 -30) years old, 15.5% of them were between (31 -40) years old, 11% of them were between (41- 50) years old, and 3.3% of them were between (51 -60) years old.

And their distribution according to their marital status, 52.7% of the sample members were singles, while 47.3% were married.

And when the married participants were asked about the number of their children, 27.6% said that they had one child, while 28.4% of them had two or three children, and 44% had more than three children. And when they were asked about the age of their youngest child, 18.1% of their youngest child was less than one year, while 21.6% of them had their youngest child between one and two years, 24.1% of them had their youngest child between (3) and (6) years old, and 36.2% of them had their youngest child's age more than (6) years old.

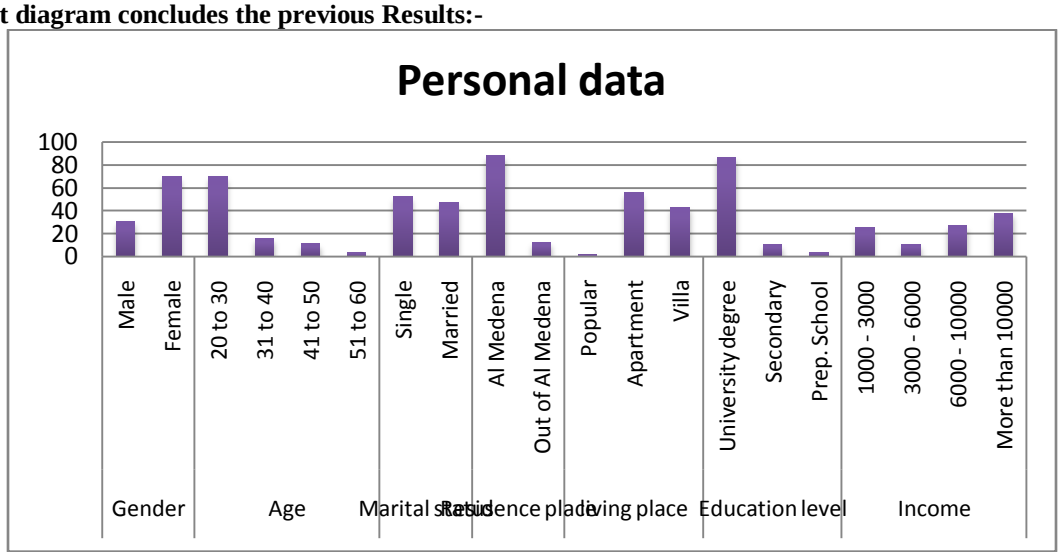
And their distribution according to their living place, 87.8% of them live in Al Medena city, while 12.2% were living out of Al-Medena.

Their distribution according to their home type was as follows; 55.5% of them were living in apartment, 42.9% of them were living in villa, and 1.6% of them were living in popular homes.

And their educational level; 86.5% of them had university degree, while 10.2% of them had secondary school certificates, and 3.3% of them had preparatory school level.

Finally their distribution according to their income, 24.9% of the participants had their incomes between (1000 – 3000) Riyal, while 10.6% of them had their incomes between (3000 – 6000) Riyal, 26.9% of them had their incomes between (6000 –10000) Riyal, and 37.6% of them had their incomes more than (10000) Riyal.

The next diagram concludes the previous Results:-



The next table shows the participants' distribution according to whether there was any vaccinations centers in their living place, 92.2% of them had vaccinations centers in their living place, while 7.8% of them hadn't.

Are the vaccinations centers available in your living area?

Answer	*Frequency*	*Percent*
Yes	226	92.2
No	19	7.8
Total	245	100.0

The next table shows the married participants' distribution according to whether their children were suffering fromimmunity decrease, 96.3% of their children don't suffer from that, while only 3.7% of their children suffer from that.

Do any of your children suffer from any of weak immune disease?

Answer	*Frequency*	*Percent*
Yes	4	3.7
No	104	96.3
Total	108	100.0

The next table shows the married participants' distribution according to whether their children had their full vaccinations or not, 91.7% of their children had their full vaccinations, while 8.3% of their hadn't.

Did your children take the full immunizations?

Answer	*Frequency*	*Percent*
Yes	99	91.7
No	9	8.3

Study Results:-

First: evaluating the general knowledge about the importance and reasons of children vaccinations in Al-Medena city:-

The next table shows the participants' distribution according to whether had ever read about the importance and reasons of children vaccinations or not, 77.6% of them had, while 22.4% of them hadn't.

Have you ever read about the advantages and disadvantage of immunizations?

Answer	*Frequency*	*Percent*
Yes	190	77.6
No	55	22.4
Total	245	100.0

And in asking those who had read about the source of the information they had read, the most important sources according to their answers was scientific methods, TV and radio, and social media websites.

If your answer was yes, from which sources you got it?

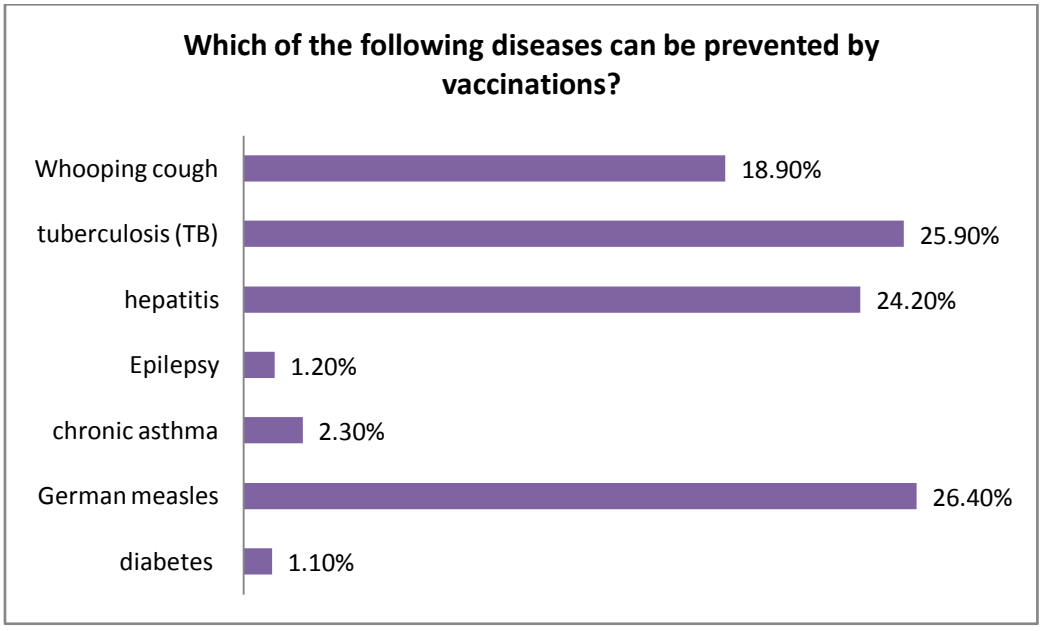
Answer	*Frequency*	*Percent*
Scientific method	116	43.1
Social media websites	51	19.0
TV or radio	56	20.8
Journals or brochures in public places	16	5.9
Other sources	30	11.2

The next table shows the participants' distribution according to their thought about the most conscious person about the importance of vaccination for the child (father or mother), 88.2% of them thought that mothers are more conscious than fathers, while 11.8% of them thought that fathers are more conscious than mothers.

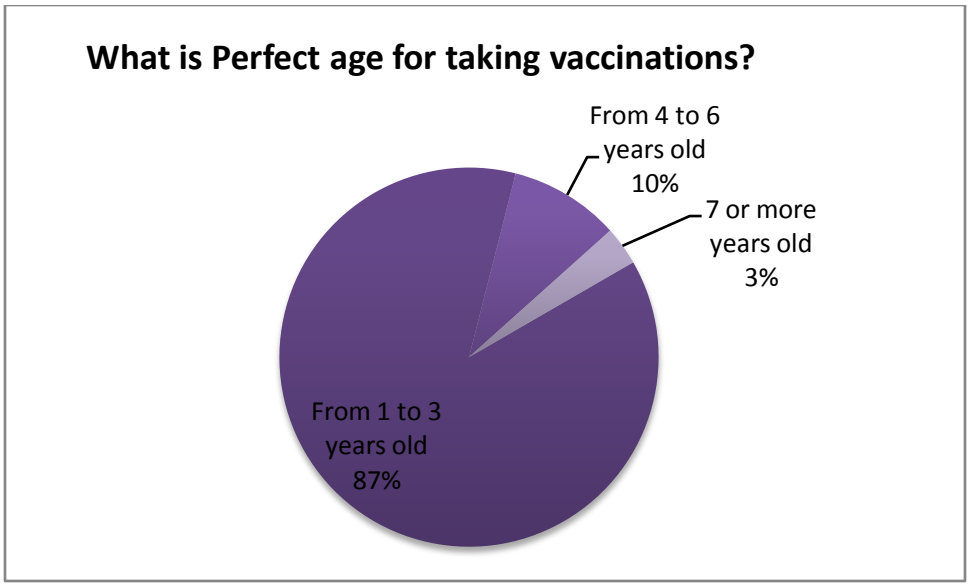
Who is more conscious about child' vaccinations, mother or father?

Answer	*Frequency*	*Percent*
Mother	216	88.2
Father	29	11.8
Total	245	100.0

The next diagram clarifies the participants answers distribution on the question of which of these diseases may be prevented by vaccinations commitment, the most important diseases according to their points of views, German measles, then tuberculosis (TB), hepatitis, and whooping cough.



The next diagram shows the participants' opinions according to the suitable age for taking vaccinations, 87.3% of them think that the suitable age is from one to (3) years old, while 9.4% of them thought that the suitable age is between (4 – 6) years old, and the others thought that it is (7) years old or more.



The next table clarifies the participants' points of views about the vaccinations importance and the culture level, 91.8% of them said that all vaccinations are important, while 8.2% of them took the opposite side

It is also clear from the table that 89% of the participants thought that there is a relation between the parent's educational level and taking the kids' vaccinations, 89.9% of them thought that there is a relation between the residence place and the society culture about the importance of children vaccinations, 95.5% of them thought that the social media websites play a role in increasing awareness about the importance of vaccinations at the that time, also it is clear that 93.1% of them thought that vaccinations prevent more than (10) dangerous diseases.

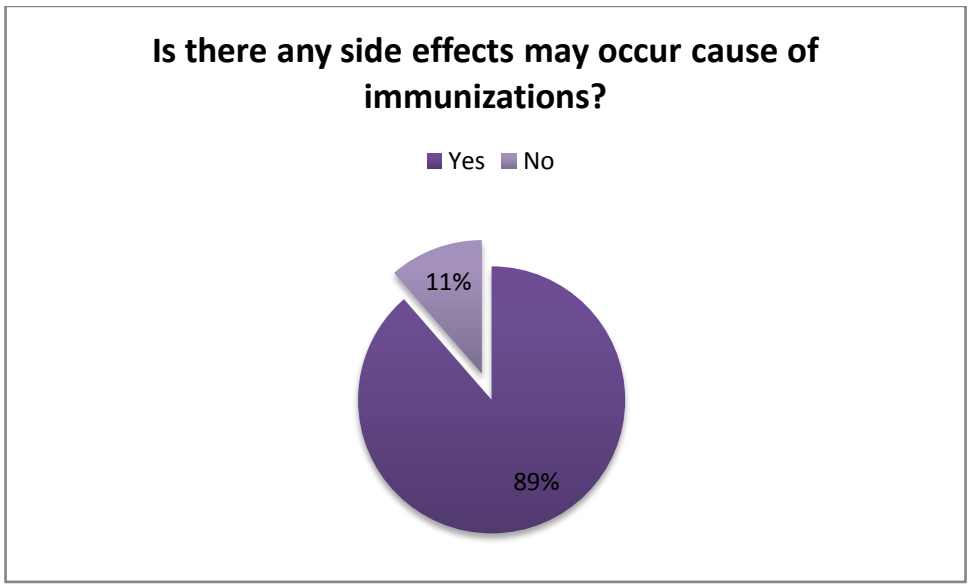
Question	*Yes # (%)*	*No # (%)*	*P-value*
Do you think that some immunizations are not important?	20 (8.2)	225 (91.8)	0.00**
do you think that there is a relation between the parent's educational level and taking the kids' vaccinations?	218 (89.0)	27 (11.0)	0.00**
Is there any relation between the residence place and the society culture about the importance of children vaccinations?	220 (89.8)	25 (10.2)	0.00**
Do you think that the social media websites play a role in increasing awareness about the importance of vaccinations at the current time?	234 (95.5)	11 (4.5)	0.00**
Vaccinations prevent more than 10 dangerous diseases?	228 (93.1)	17 (6.9)	0.00**

We conclude from the previous table that 95.5% of the sample members thought that the main children vaccinations prevent some infectious diseases and it's complications, also 85.7% of the participants thought that the first vaccination is given to the child directly after birth, 79.6% of them thought that most of the prevented diseases' vaccinations are given to the child at his first year, 81.2% of them thought that multiple doses of the same vaccine at separate intervals can strengthen the child's immunity, 42% of them thought that giving more than one vaccine at the same time don't cause any harm to the child's immunity, 89.4% of them thought that it is important to vaccinate children through seasonal vaccinations campaigns, 46.5% of them thought that It is preferred to give the seasonal flu vaccine for children, while 55.5% of them thought that vaccinations are reasons for the emergence of autism in children, 38% of them thought that flue, ears inflammations and diarrhea are not vaccination contraindications, while the same percentage 38% of them thought that these inflammations are vaccinations' contraindications.

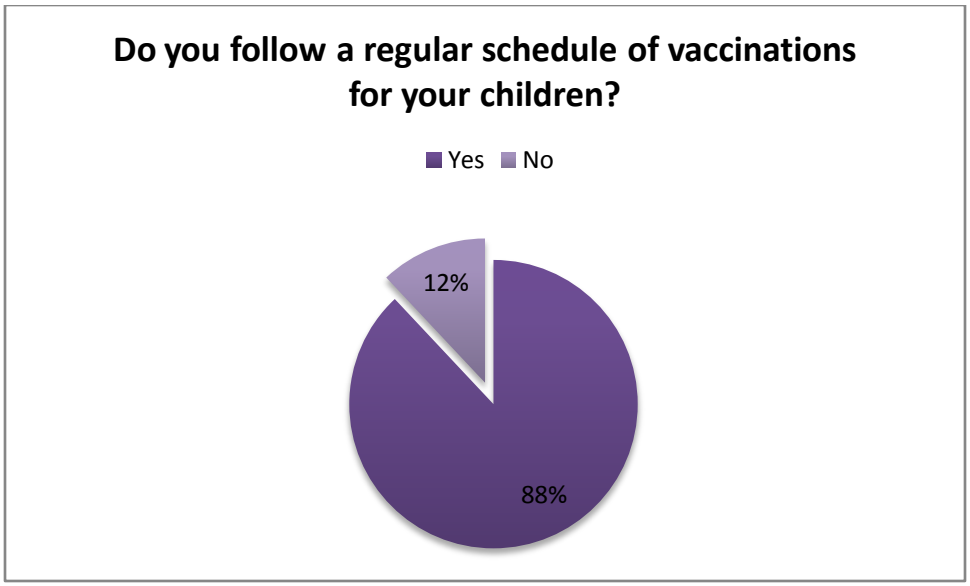
Question	*Agree # (%)*	*Disagree # (%)*	*I don't know # (%)*	*P-value*
The main children immunizations prevent some Infectious diseases and their complications?	234 **(**95.5**)**	4 (1.6)	7 (2.9**)**	0.00**
The first vaccinate is given directly after birth?	210 **(**85.7**)**	14 (5.7)	21 (8.6)	0.00**
Most of the prevented diseases' immunizations are taken during the first year of life?	195 **(**79.6**)**	15 (6.1)	35 (14.3)	0.00**
Do you think that multiple doses of the same vaccine at separate intervals to strengthen the child's immunity?	199 **(**81.2**)**	15 (6.1)	31 (12.7)	0.00**
Taking more than one vaccine at the same time don't cause any harm to the child's immunity?	103 **(**42.0**)**	59 (24.1)	83 (33.9)	0.003**
Is it important to vaccinate your child during the seasonal vaccination campaigns?	219 **(**89.4**)**	14 (5.7)	12 (4.9)	0.00**
Is it preferred to give the seasonal flu vaccine for children?	158 **(**64.5**)**	52 (21.2)	35 (14.3)	0.00**
Are Vaccinations reasons for the emergence of autism in children?	12 **(**4.9**)**	136 (55.5)	97 (39.6)	0.00**
Flue, ears inflammations and diarrhea are not vaccination contraindications?	93**(**38.0**)**	93 (38.0)	59 (24.1)	0.009**

Second: general knowledge about vaccinations disadvantages and their side effects:

The next diagram clarifies the participants' distribution according to whether they thought that vaccinations may cause side effects as high temperature, pain or sensitivity…etc. 88.6% of them thought that, while 11.4% of them didn't think so:



The next diagram clarifies the participants' distribution according to following their children vaccinations schedule, 88% of them follow that schedule, while 12% of them didn't follow it.



We can conclude from the next table that: nearly 90% of the sample members thought that the advantages of vaccinations are more than it's disadvantages, and nearly 72% of them thought that vaccination may never decrease the child's immunity. And most of the participants thought that vaccinations are religiously accepted.

We also conclude that nearly 62% of the participants thought that vaccinations against a specific disease may never made the child susceptible to the same disease, 96% thought that it is important to continue following the vaccinations schedule, and the same percentage for those who thought that vaccinations protect the child's health, and 93% of them thought that vaccinations commitment prevents polio.

Question	Strongly Agree *# (%)*	Agree *# (%)*	I don't know *# (%)*	Disagree *# (%)*	Strongly Disagree *# (%)*	*P-value*
The advantages of vaccination is more than it's disadvantages?	153 (62.4)	70 **(**28.6**)**	14 (5.7)	5 **(**2.0**)**	3 (1.2)	0.00**
Vaccinations decrease the child's immunity?	8 (3.3)	14 (5.7)	45 (18.4)	108 (44.1)	70 (28.6)	0.00**
Vaccinations are religiously accepted?	155 (63.3)	57 (23.3)	32 (13.1)	1 (.4)	0 (0.0)	0.00**
Vaccinations for specific disease may make the child susceptible to the same disease?	8 (3.3)	29 (11.8)	56 (22.9)	100 (40.8)	52 (21.2)	0.00**
It is important to continue following the vaccinations schedule?	166 (67.8)	70 (28.6)	4 (1.6)	3 (1.2)	2 (0.8)	0.00**
Vaccinations protect the child's health?	151 (61.6)	86 (35.1)	3 (1.2)	2 (0.8)	3 (1.2)	0.00**
Vaccinations commitment prevents polio?	163 (66.5)	65 (26.5)	10 (4.1)	5 (2.0)	2 (0.8)	0.00**

The next table shows the participants' distribution according to their thought that a slight rise in temperature after taking the vaccination is one of the symptoms that indicate the effectiveness of vaccination and immunity of the child, 76.7% of them thought that, while the others didn't think so.

Do you think that a slight rise in temperature after taking the vaccination is one of the symptoms that indicate the effectiveness of vaccination and immunity of the child?

Answer	*Frequency*	*Percent*
Yes	188	76.7
No	57	23.3
Total	245	100.0

The next table shows the participants' distribution according to their thought that it is good to give the first vaccination to the child before being in school, 97.1% of them agreed with that, while 2.9% of them didn't think so.

Are you with giving the first vaccination to the child before being in school?

Answer	*Frequency*	*Percent*
Yes, I'm with	238	97.1
No, I'm against that	7	2.9
Total	245	100.0

The next table shows the participants distribution according to whether they ever have any of their family members suffered from side effects of vaccinations, 86.9% of them didn't think that, while 13.1% of them that at least one of their family members suffer from vaccinations side effects.

Have any of your family members suffer from side effects of vaccinations?

Answer	*Frequency*	*Percent*
Yes	32	13.1
No	213	86.9
Total	245	100.0

Discussion:-

Parental decisions regarding immunization are very important for increasing the immunization rate and compliance and for decreasing any possible immunization errors. Parents' knowledge and practices regarding immunization are the major factors that contribute to their vaccination decisions (17). So this study aimed to increase public awareness and attention about the importance of childhood vaccination and its rule on preventing a serious groups of disease and the risks of non-vaccination.

In our study the demographic characteristics of the parents showed that the majority of participants were females, this like the results of previous studies (18, 19). Indicating that child immunization is mainly under the mother's responsibility, rather than the father's.

70.2% of our of participants were between (20 -30) years old, 86.5% of them had universityeducational level,92.2 %of the participants had vaccinations centers available in living area for, and 96.3% their children don't suffer from any of weak immune disease. All this high ratio in the previous points may Contributed in increase the rate of the participants children whose take the full immunizations, we found that 91.7% their children take the full immunizations.

The present study showed a good general knowledge about the children vaccinations among parents, many previous studies found similar results (20, 21, 22).

knowledge has a great impact on the children's immunization rate and maintaining up-to-date immunization status(23, 24).

The most of parents read about the advantages and disadvantage of immunizations, 43.1% of them read by Scientific method. But mothers were more conscious than fathers about child' vaccinations.

89% of the participants thought that there is a relation between the parent's educational level and taking the kids' vaccinations, Several studies have found that actually Completeness of vaccination was significantly correlated with knowledge of mothers on immunization (25, 26).

Most of our participants thought that the main children vaccinations prevent some infectious diseases and it's complications. The finding is similar to results in other studies (21, 27, 28, 29).

Most vaccines in the childhood immunization schedule require two or more doses for development of an adequate and persisting antibody response (30). 81.2% of participants thought that multiple doses of the same vaccine at separate intervals can strengthen the child's immunity, this results not conform Yousif et al., study whose found that Only 41.6% of the interviewees correctly knew the importance of administration of multi-doses of the same vaccine given at intervals for child immunity (18). Only 42% thought that giving more than one vaccine at the same time

don't cause any harm to the child's immunity. this close to Yousif et al., study whose found that 37.1% of their participants knew that the administration of more than one vaccine at the same time have no negative impacts on child immunity (18). However there is no scientific evidence that supports parents' fears about combined vaccines causing immune overload (31). 89.4% of our participants thought that it is important to vaccinate children through seasonal vaccinations campaigns. 46.5% of them thought that It is preferred to give the seasonal flu vaccine for children, this results very close to Yousif et al., study (18). 38% of our participants thought that flue, ears inflammations and diarrhea are not vaccination contraindications, while Yousif et al., found that 61.7% thought the same thing (18).

88.6% of participants thought that vaccinations may cause side effects as high temperature, pain or sensitivity…etc.this results agree with Yousif et al., results (18). Generally fever ≥40.5°C is a factor to be taken into account but is not a contraindication according to immunization recommendations (27).

88% of our participants follow that schedule this shows the interest of parents in the vaccination, according to a schedule. Devkota et al., reported at their study in Nepal that 76.7% of children had been immunized on the recommended schedule (32).

Most of our participantshought that the advantages of vaccinations are more than it's disadvantages, and vaccination may never decrease the child's immunity. And majority of the participants thought that vaccinations are religiously accepted. 96% thought that it is important to continue following the vaccinations schedule, and previously we noted that 88% of our participants follow that schedule. Generally it's clear that parents have positive attitude towards vaccinations. To improve parents' perceptions of the benefits and risks of vaccines it's important to improving communication (33).

The most of participants rise in temperature after taking the vaccination is one of the symptoms that indicate the effectiveness of vaccination and immunity of the child. Scientifically vaccines help develop immunity by imitating an infection the imitation infection can cause minor symptoms, such as fever (34).

Conclusion:-

Results of the present study showed that parents in Al-Madinah , Saudi Arabia have had good knowledge and positive attitudes on most of aspects related childhood immunization.

Recommendation:-

- Health education campaigns about vaccination for parents.
- Educating parents about the side effects of vaccination and how to handle them.
- Educating parents inhibitors vaccination in children.
- meetings between mothers with children in the same age to exchange information at maternal and child health centers.
- Media manipulation larger to awareness about vaccination of what media impact in people's lives.

References:-

1. Andre FE, Booy R, Bock HL, Clemens J, Datta SK, et al. (2008) Vaccination greatly reduces disease, disability, death and inequity worldwide. Bull World Health Organ 86: 140-146.
2. Wright PF. Global immunization: a medical perspective. SocSci Med. 1995;41:609–16. doi: 10.1016/0277-9536(95)00033-4. [PubMed] [Cross Ref]
3. World Health organization media centre (2013) Immunization coverage Fact sheet N°378 April 2013.
4. Jheeta M, Newell J (2008) Childhood vaccination in Africa and Asia: the effects of parents' knowledge and attitudes. Bull World Health Organ 86: 419.
5. Kimmel SR, Burns IT, Wolfe RM, Zimmerman RK (2007) Addressing immunization barriers, benefits, and risks. J FamPract 56: S61-69.
6. Smith MJ, Woods CR, Marshall GS (2009) Parental vaccine concerns in Kentucky. J Ky Med Assoc 107: 342-349.
7. Expanded Programme on Immunization The Social Science and Immunization Research Project. WklyEpidemiol Rec. 1998;73:285–8. [PubMed]

8. http://www.omicsonline.org/open-access/parents-knowledge-and-attitudes-on-childhood-immunization-taif-saudi-arabia-2157-7560.1000215.php?aid=24212
9. http://bmcpediatr.biomedcentral.com/articles/10.1186/1471-2431-14-254
10. pediatrics.aappublications.org
11. http://onlinelibrary.wiley.com/doi/10.1046/j.1365-2214.2003.00347.x/abstract
12. http://pediatrics.aappublications.org/content/115/5/1428.short
13. http://archpedi.jamanetwork.com/article.aspx?articleid=513942
14. http://www.ajol.info/index.php/ejpai/article/view/108502
15. http://europepmc.org/abstract/med/19813430
16. Gellin, B. G., Maibach, E. W., & Marcuse, E. K. (2000). Do parents understand immunizations? A national telephone survey. *Pediatrics*, *106*(5), 1097-1102.
17. Yousif, M. A., Albarraq, A. A., Abdallah, M. A. A., &Elbur, A. I. (2014). Parents′ Knowledge and Attitudes on Childhood Immunization, Taif, Saudi Arabia. *Journal of Vaccines & Vaccination*, *2014*.
18. Awadh, A. I., Hassali, M. A., Al-Lela, O. Q., Bux, S. H., Elkalmi, R. M., &Hadi, H. (2014). Does an educational intervention improve parents' knowledge about immunization? Experience from Malaysia. *BMC pediatrics*, *14*(1), 1.
19. Asim, M., Malik, N., Yousaf, H., Gillani, I., &Habib, N. (2012). An assessment of parental knowledge, belief and attitude toward childhood immunization among minorities in rural areas of district Faisalabad, Pakistan. *Mediter J SocSci*, *3*, 153-159.
20. Bernsen, R., Al-Zahmi, F. R., Al-Ali, N. A., Hamoudi, R. O., Ali, N. A., Schneider, J., ... &Grivna, M. (2011). Knowledge, attitude and practice towards immunizations among mothers in a traditional city in the United Arab Emirates.*HAMDAN MEDICAL JOURNAL*, *4*(3), 114-121.
21. Borràs, E., Domínguez, À., Fuentes, M., Batalla, J., Cardeñosa, N., &Plasencia, A. (2009). Parental knowledge of paediatric vaccination. BMC Public Health, 9(1), 1.
22. Favin, M., Steinglass, R., Fields, R., Banerjee, K., &Sawhney, M. (2012). Why children are not vaccinated: a review of the grey literature. International health, 4(4), 229-238.
23. Esposito, S., Principi, N., &Cornaglia, G. (2014). Barriers to the vaccination of children and adolescents and possible solutions. *Clinical Microbiology and Infection*, *20*(s5), 25-31.
24. Odusanya, O. O., Alufohai, E. F., Meurice, F. P., &Ahonkhai, V. I. (2008). Determinants of vaccination coverage in rural Nigeria. *BMC Public health*, *8*(1), 1.
25. Chhabra, P., Nair, P., Gupta, A., Sandhir, M., &Kannan, A. T. (2007). Immunization in urbanized villages of Delhi. *The Indian Journal of Pediatrics*,*74*(2), 131-134.
26. Al-Lela, O. Q. B., Bahari, M. B., Al-Qazaz, H. K., Salih, M. R., Jamshed, S. Q., &Elkalmi, R. M. (2014). Are parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance? a mixed method study. BMC pediatrics, 14(1), 20.
27. Qidwai, W., Ali, S. S., &Ayub, S. (2007). Knowledge, attitude and practice regarding immunization among family practice patients. *Journal of Dow University of Health Sciences*, *1*(1).
28. Mansuri, F. A., &Baig, L. A. (2003). Assessment of immunization service in perspective of both the recipients and the providers: a reflection from focus group discussions. *J Ayub Med CollAbbottabad*, *15*(1), 14-18.
29. World Health Organization. (2011). Report of the WHO expert consultation on foodborne trematode infections and taeniasi.
30. Hilton, S., Petticrew, M., & Hunt, K. (2006). Combined vaccines are like a sudden onslaught to the body's immune system': Parental concerns about vaccine 'overload'and 'immune-vulnerability. *Vaccine*, *24*(20), 4321-4327.
31. Devkota, S., Simkhada, P., Teijlingen, V. E., &Rai, L. D. (2014). Parents' knowledge and practices to childhood immunisation in Nepal.
32. Al-lela, O. Q. B., Bahari, M. B., Al-abbassi, M. G., & Basher, A. Y. (2011). Development of a questionnaire on knowledge, attitude and practice about immunization among Iraqi parents. *Journal of Public Health*, *19*(6), 497-503.
33. Vlasova, A. N., Marthaler, D., Wang, Q., Culhane, M. R., Rossow, K. D., Rovira, A., ... &Saif, L. J. (2014). Distinct characteristics and complex evolution of PEDV strains, North America, May 2013-February 2014. *Emerg Infect Dis*, *20*(10), 1620-1628.