CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.2547801

Available online at: http://www.iajps.com Research Article

VACCINATION KNOWLEDGE, ATTITUDE AND PRACTICE AMONG SAUDI PARENTS IN MAKKAH - CROSS SECTIONAL STUDY

Maryam Mohammed Al-Ghamdi [1], Hootaf Saeed Bafhaid [2], Anwar Abdullah Al-Hazmi[2], Lujain Yousef Al-Johani [1], Anwaar Ahmed Al-Majnuni [3], Abdulwahab Hesham Bin Melieh[2]

[1] Faculty of Pharmacy, Umm Al-Qura University, Makkah, Saudi Arabia
[2] Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia
[3] Faculty of Public Health and Informatics, Umm Al-Qura University, Makkah, Saudi Arabia

Abstract:

Background: *In health care, prevention of disease is always better than treatment. Ehreth estimated that annually up to three million children's lives are saved by vaccinations.Despite the incidence of vaccine-preventable diseases has declined, concern about vaccine safety has increased. Because parents are the primary health decision-makers for their children, their knowledge and practices regarding immunization in general have a great impact on the immunization status of their children.****Objective:*** *Our study aimed to assess knowledge, attitude and practice regarding childhood vaccination and their associated factors among Saudi parents in Makkah city.****Methods:****An observational, Cross sectional study was conducted for one month (July 2018) in Makkah, Saudi Arabia. Saudi parents of children aged from 2 months to 7 years who lives in Makkah were invited to participate in this study.****Results:****Of 400 parents contacted, 273 completed the questionnaire. Majority of them were mothers (84%). Most of them (34.5%) had their information regarding child vaccination from medical staff, followed by social media (21.9%).The results revealed that almost half of parents (57%) had adequate knowledge regarding child vaccination. Attitude towards child vaccination was positive in (53%) of the parents. Only (75%) Compliance with the MOH vaccination schedule.****Conclusions:****Although more than half of parents had acceptable KAP toward their children immunization, however there is a significant proportion of parents had misguided knowledge and attitudes about some aspects of child immunization and educational program is needed. the age of the parents needs to be taken into consideration when the program is planned.*

Keywords: *Vaccination, Immunization, Parents, Knowledge, Attitude, KAP, Makkah*

Corresponding author:

Maryam Mohammed Al-Ghamdi,
PharmD
Faculty of Pharmacy,
Umm Al-Qura University, Makkah,
Saudi Arabia

QR code

Please cite this article in press *Maryam Mohammed Al-Ghamdi* ***et al., Vaccination Knowledge, Attitude and Practice among Saudi Parents in Makkah - Cross Sectional Study., Indo Am. J. P. Sci, 2019; 06(01).***

INTRODUCTION:

In health care, prevention of disease is always better than treatment. Vaccination, a sanitary action that has allowed to reduce mortality and eradicate many diseases [1]. Vaccines stimulate the immune system to protect the body and identify diseases and resistance. the vaccine helps States to reduce the cost of treatment of diseases if it is maintained correctly and regularly is considered [2]. The childhood of the most important Stages to strengthen the immune system and maintain the body of diseases and help the vaccines in the development of immunity to children against diseases before they come into contact with them [3]. Ehreth estimated that annually up to three million children's lives are saved by vaccinations, but still another three million lives worldwide are lost from vaccine- preventable diseases [4].

In Kingdom of Saudi Arabia, the most vaccinations known by the Ministry of Health within the Vaccination schedule, from birth to getting into the primary grade, aims to shield kids within the Kingdom from infectious diseases which can affected them in many ways [5].

Makkah during Hajj and Umrah draws in expansive number of travelers from around the world and are a potential chance for the transmission of irresistible illnesses between pioneers, and to the children [6]. Example, the chance of obtrusive meningococcal infection (IMD) due to improved transmission of the living being between participants [7]. In reaction to our citizens' requests and to grant impulse to their wishes, the Ministry of Health (MOH) has reported that childhood vaccines are accessible in all wellbeing centers day by day, rather than two days as it were per week [8].

Immunization reluctance is an issue of worldwide concern in created and creating countries for occasion, in a later pan-Canadian overview, half of the guardians were concerned that modern immunizations are not as secure as more seasoned immunizations and one-third felt that children nowadays get as well numerous immunizations, indeed in case nine out of ten of these guardians demonstrated their child's immunization was up to date [9].

There are a few major barriers towards children's immunizations. One of them is parental misperceptions [10]. During the past few years, physicians in the kingdom were confronting a growing number of parents who are questioning the safety and need of routine childhood vaccination because of some myths and misconceptions about vaccination [3]. Most of parents in KSA believed that vaccines can cause autism and disabilities [11]. parents also worry about the pain their children experience when receiving multiple injections at a single office visit. This can lead them to delay or refuse vaccinations [12]. Other factors such as believing that children receive too many vaccinations and that vaccines overload the immune system [13]. Addition to forgetting and not knowing that the child needs a vaccine booster [14,15]. Parents who refuse vaccinations might also be influenced by other factors [16]. Such as concerns about vaccine components, low perceived likelihood and severity of the infectious diseases [16,17,18].

According to worldwide report issued by the CDC, it was expressed that the global parental Attitude and knowledge with respect to immunization administrations was low and parents have negative convictions and belief around measles and vaccination programs [3].

Studies have shown that rising parents' knowledge concerning vaccines improves immunization standing and affects the success of immunizations program, addition to parents' practice. which make a good impact on parents that who is making a decision for their children health [19,20]. Parents' attitudes are also an important predictor of immunizations uptake [21,22,23,24]. Thus, there is an essential need to evaluate parents' knowledge and practice regarding their children immunization to enhance and increment immunization scope and completeness [10].

In spite of the fact that much has been distributed within the international literature on parents' knowledge, attitudes and practices regarding child vaccination [25]. Previous studies have been conducted in some regions of Saudi Arabia including Al-Riyadh, Al-Taif, Al-Madina and Najran [26]. however no such study has been reported in Makkah city

Therefore, this study was conducted to describe and analyze the knowledge and attitudes of parents about vaccines and immunization practices.

Objectives: This study aimed at describing and analyzing the knowledge and attitudes of parents of newborns and children of 2 months or more against the application of vaccines and evaluating the vaccination status of children as well as assessing the relation between health care providers' influence and Parents who have concerns about vaccine safety and

also exploring factors affecting on knowledge level of parents.

MATERIAL AND METHODS:

Study design and Participants

An observational, Cross sectional study was conducted for one month (July 2018) in Makkah, Saudi Arabia. Saudi parents of children aged from 2 months to 6 years who lives in Makkah were invited to participate in this study.

Development of the questionnaire

A comprehensive literature search was performed of electronic databases (MEDLINE and EMBASE), and relevant studies were reviewed with the aim of informing design of this study [3,10]. The questionnaire was initially created in English language.

The questionnaire includes 5 sections, the demographic data (age, gender, level of education, occupation and number of children), knowledge, attitude, practice of parents toward childhood immunization questions and last section was about factors associated parents' KAP.

Translation

Three of the authors who speak both English and Arabic have translated the questionnaire into Arabic language to make it simple to the Saudi participants. In order to ensure the accuracy of the questionnaire one of the researchers reviewed the primary version and then, the first version of the questionnaire was validating after using the standard forwards and backwards method.

Piloting

The questionnaire was tested with a group of 6 parents. Minor modifications were recommended and adopted in the final questionnaire. These 6 parents were not included in the study.

Ethical consideration

Participation in the study was voluntary. Informed Consent was included in questionnaire.

Data collection

Data were collected by Co - Authors. A representative sample of 273 of participants living in varied area of Makkah was selected randomly to filling electronic questionnaire.

After completing the questionnaire, all the respondents received a link from Saudi ministry of health website that contain all correct information regarding vaccination of children to enhance their knowledge and decrease the misguided safety concerns about vaccinations.

Statistical analysis

Three-Point Likert Scales (Agree, Not sure, Disagree) was utilized to evaluate parents' knowledge and attitudes toward childhood immunization. A final score was created for the knowledge statements as correct answers got a score of "1" whereas wrong answers got a score of "0". Total knowledge score was computed, and the median value was identified (it was 6 out of 10). Parents scored below the median value were considered as having "inadequate knowledge" whereas those scored at or above the median value were considered as having "adequate knowledge".

A score was created for the attitude statements as answers suggesting positive attitude were given a score of "1" whereas those suggesting negative attitude were given a score of "0". Total attitude score was computed, and the median value was identified (it was 5 out of 6). Parents scored below the median value were considered as having "negative attitude" whereas those scored at or above the median value were considered as having "positive attitude".

Data were entered, coded and processed using Microsoft Excel and the software Statistical Package for Social Science (SPSS) (Version 23) for Windows system. Descriptive statistics, frequencies and percentages were used to describe all variables. Association between dependent variables (Parent's KAP) and independent variables (Parent's socio-demographics) were tested by using Chi-square test. *P* values of <0.05 were considered statistically significant.

RESULTS:

Socio-demographic characteristics of parents

Two hundred and seventy-four parents participated in the study. Their baseline characteristics are presented in Table (1). Majority of them were mothers (84.2%) and aged either between 20 - 30 (49.1%) or between 31- 40 (35.2%). Most of the parents had "1" preschool child by 58.2%, the family size is between 4-6 for the most participants by (50.2%). Majority of participant live in urban than rural by (93.4 %). Most of the parents had a bachelor's degree by (59.7%). (54.2%) of parents are unemployed and (45.8%) of them are employed, while those who work in the health field are (19%) (Table. 1).

Table 1: Baseline characteristics (N=273).

Variable	Frequency	Percent (%)
Gender		
Male	43	15.8
Female	230	84.2
Age (Years)		
< 20	4	1.5
20 - 30	134	49.1
31 - 40	96	35.2
41 - 50	28	10.3
> 50	11	4
Number of Preschool Children		
1	159	58.2
2	94	34.4
>3	20	7.3
Family Size		
4	100	36.6
4-6	137	50.2
>6	36	13.2
Place of Living		
Rural	18	6.6
Urban	255	93.4
Last Qualification		
Elementary School	3	1
Secondary School	48	17.6
Diploma Degree	24	8.8
Bachelor's Degree	163	59.7
Master's Degree	31	11.4
Doctoral Degree	4	1.5
Employment Status		
Employed	125	45.8
unemployed	148	54.2
Do you work in health field		
Yes	52	19
No	221	81

Parents' knowledge toward vaccination

Table (2) shows that (42.1%) parents agreed with "The diseases that children vaccinated against them affect children in the first year of life", and 221 (81%) participants correctly agreed with "Routine vaccination protects children against infectious diseases and their complications".

For safety statements 207 (75.8%) of parents agreed that "Vaccination is generally not harmful to children", and 166 (60.8%) of them disagreed with "Vaccination may lead to autism". Only (34.1%) from parents agreed with "Giving more than one vaccine to the child at one time doesn't harm his/her immunity".

Approximately (43%) of the participants agreed that it is preferred to give children seasonal influenza vaccine and only 23.8% recognized that common cold, otitis media and diarrhea are not contraindications to vaccination.

Table 2: Responses of the participants to knowledge statements (N=273).

Statements	Positive responses No.	%
1. The diseases that children vaccinated against them affect children in the first year of life **(Agree)**	115	42.1%
2. Routine vaccination protects children against infectious diseases and their complications **(Agree)**	221	81 %
3. Children were given frequent doses of the vaccine separated by definite specific times to constitute their immunity **(Agree)**	216	79.1 %
4. Giving more than one vaccine to the child at one time doesn't harm his/her immunity **(Agree)**	93	34.1%
5. It is preferred to give children seasonal influenza vaccine **(Agree)**	118	43.2%
6. Vaccination may lead to autism **(Disagree)**	166	60.8%
7. It is necessary to vaccinate children during vaccination campaigns **(Agree)**	156	57.1%
8. Common cold, otitis media and diarrhea are not contraindications to vaccination **(Agree)**	65	23.8%
9. Vaccination is generally harmful for children **(Disagree)**	207	75.8%
10. Diseases that children in the Kingdom vaccinated against them are known **(Agree)**	199	72.9%

Figure (1) shows (57%) responses of participants was adequate knowledge while (43%) of them had inadequate knowledge.

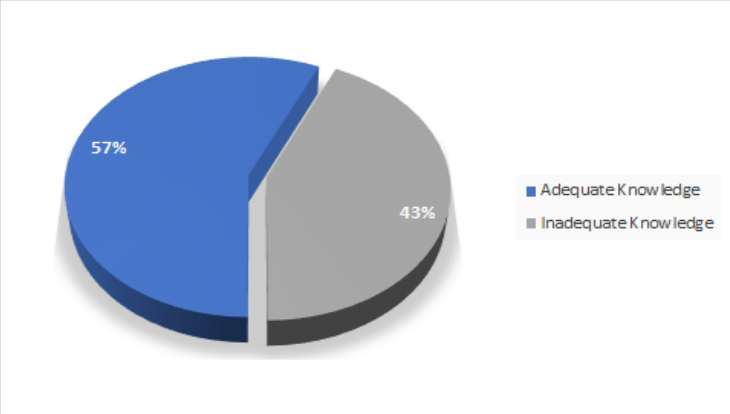

Figure 1: Knowledge level of parents about childhood vaccinations.

Parents' attitudes toward vaccination

Table (3) shows that 253 (92.7%) of parents had positive responses about vaccinations are important to keep a child's health. And 238 (87%) of parents had positive responses about compliance with the MOH vaccination schedule is very important. while 148 (54.2%) of parents disagreed with "Vaccine has dangerous side effects". Only (40.3%) of them disagreed with "vaccine doesn't give child immunity against infectious diseases and he may get infection even after vaccination".

Table 3: Responses of the participants to attitude statements towards child vaccination (N=273).

Statements	Positive responses No.	%
1. Vaccinations are important to keep child`s health **(Agree)**	253	92.7%
2. Benefits of vaccinations exceeds their harms **(Agree)**	223	81.7%
3. Child vaccination is safe and not harmful **(Agree)**	204	74.7%
4. Vaccine has dangerous side effects **(Disagree)**	148	54.2%
5. Vaccine doesn't give child immunity against infectious diseases and he may get infection even after vaccination **(Disagree)**	110	40.3%
6. Compliance with the MOH vaccination schedule is very important **(Agree)**	238	87%

Figure (2) showed that 53% of parents' responses had a positive attitude, while 47% of them had a negative attitude.

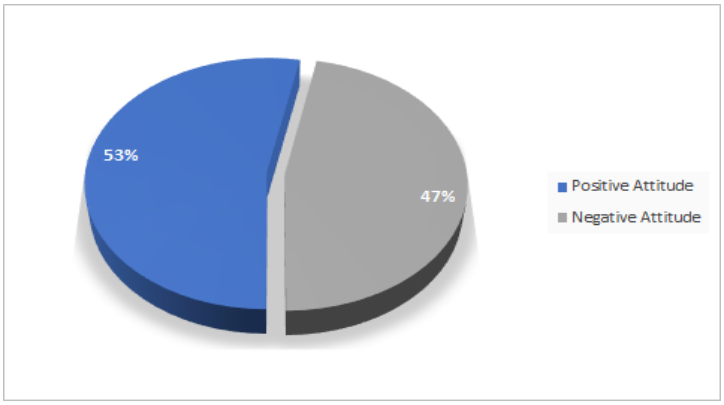

Figure 2: Parents attitude status toward childhood vaccination.

Table (4) shows that significant between parents' knowledge about child vaccination and attitude with (P-value <0.001). That's mean Parents who had Adequate knowledge about child vaccination were more likely to have positive attitude towards it and vice versa.

.

Table 4: Association between Knowledge and Attitude of parent

Knowledge about child vaccination	Positive Attitude N=145	Negative Attitude N=128	P- Value
Adequate	113 (72.9%)	42 (27.1%)	<0.001
Inadequate	32 (27.1%)	86 (72.9%)	

Parents' practice toward immunization of children

Figure (3) shows that if parents' coverage all their children vaccination according to MOH vaccination schedule, 75% of parents are coverage their children vaccination, while 25% of them did not compliance.

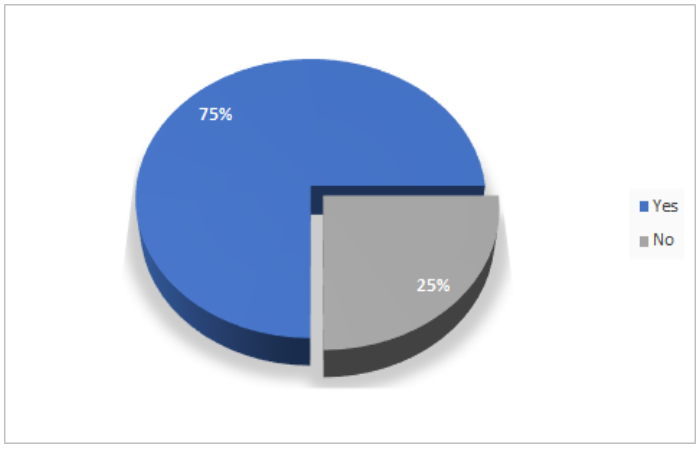

Figure 3: Children vaccination coverage in Makkah

Figure (4) shows the common side effects of vaccination among children was "Fever" with 50.0%, then "Swelling at vaccination site" 32.9%, while "Pain at vaccination site"16.6%, 0.5% of parents choose "others" for common side effects.

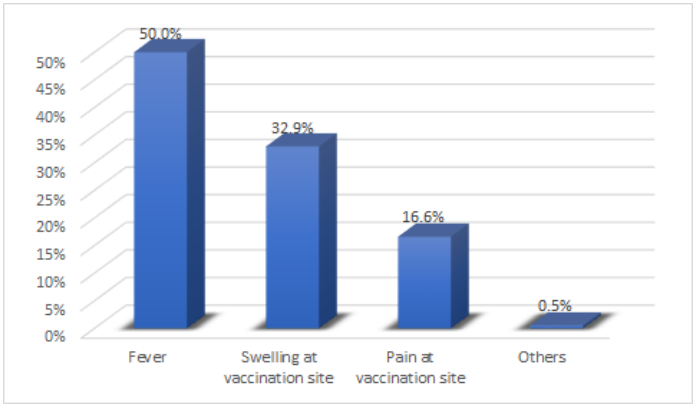

Figure 4: Common side effects of vaccination among children.

Figure (5) shows that most parents 84% had a response regarding the vaccination side effect with analgesics and cold compresses, while 16% of them had no response.

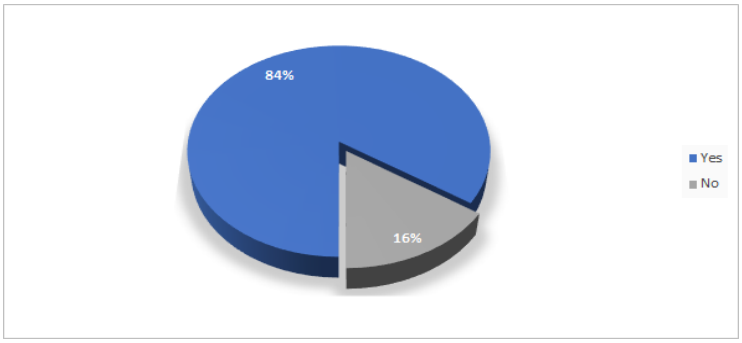

Figure 5: Parents' response to vaccination side effect.

Association between parents' KAP and demographics

Table (5) shows that all different Socio-demographics factors (gender, age, family size, Number of Preschool Children, place of living, last qualification, employment status and if the parents are a health care provider) have no significant because all P-Values between knowledge and Socio-demographics factors of parents regarding child vaccination more than (0.05) witch mean (P-value >0.05).

Table 5: Socio-demographics factors associated with knowledge of parents regarding child vaccination

Factors	Adequate Knowledge N =155	Inadequate knowledge N=118	P-value
Gender			
Male	21 (48.8%)	22 (51.2%)	0.252
Female	134 (58.3%)	96 (41.7%)	
Age (Years)			
< 20	1 (25.0%)	3 (75.0%)	0.518
20 - 30	79 (59.0%)	55 (41.0%)	
31 - 40	56 (58.3%)	40 (41.7%)	
41 - 50	13 (46.4%)	15 (53.6%)	
> 50	6 (54.5%)	5 (45.5%)	
Family Size			
<4	57 (57.0%)	43 (43.0%)	0.830
4-6	76 (55.5%)	61 (44.5%)	
>6	22 (61.1%)	14 (38.9%)	
Number Of Preschool Children			
1	93 (58.5%)	66 (41.5%)	0.681
2	50 (53.2%)	44 (46.8%)	
>2	12 (60.0%)	8 (40.0%)	
Place of living			
Rural	144 (56.5%)	111 (43.5%)	0.701
Urban	11 (61.1%)	7 (38.9%)	
Last Qualification			
Elementary School	1 (33.3%)	2 (66.7%)	0.303
Secondary School	26 (54.2%)	22 (45.8%)	
Diploma Degree	9 (37.5%)	15 (62.5%)	
Bachelor Degree	96 (58.9%)	67 (41.1%)	
Master's Degree	20 (64.5%)	11 (35.5%)	
Doctoral Degree	3 (75.0%)	1 (25.0%)	
Employment Status			
Employed	72 (57.6%)	53 (42.4%)	0.801
Unemployed	83 (56.1%)	65 (43.9%)	
Are you a health care provider			
Yes	35 (67.3%)	17 (32.7%)	0.088
No	120 (54.3%)	101 (45.7%)	

Table (6) shows that all different Socio-demographics factors (gender, age, family size, Number of Preschool Children, place of living, last qualification, employment status and if the parents are a health care provider) have no significant because all P-Values between Attitude and Socio-demographics factors of parents regarding child vaccination more than (0.05) witch mean (P-value >0.05).

Table 6: Socio-demographics factors associated with Attitude of parents regarding child vaccination

Factors	Positive Attitude N=145	Negative Attitude N=128	P-value
Gender			
Male	17 (39.5%)	26 (60.5%)	0.052
Female	128 (55.7%)	102 (44.3%)	
Age (Years)			
< 20	1 (25.0%)	3 (75.0%)	0.414
20 - 30	77 (57.5%)	57 (42.5%)	
31 - 40	47 (49.0%)	49 (51.0%)	
41 - 50	13 (46.4%)	15 (53.6%)	
> 50	7 (63.6%)	4 (36.4%)	
Family Size			
<4	55 (55.0%)	45 (45.0%)	0.724
4-6	73 (53.3%)	64 (46.7%)	
>6	17 (47.2%)	19 (52.8%)	
Number Of Preschool Children			
1	85 (53.5%)	74 (46.5%)	0.761
2	48 (51.1%)	46 (48.9%)	
>2	12 (60.0%)	8 (40.0%)	
Place of living			
Rural	135 (52.9%)	120 (47.1%)	0.830
Urban	10 (55.6%)	8 (44.4%)	
Last Qualification			
Elementary School	1 (33.3%)	2 (66.7%)	0.306
Secondary School	22 (45.8%)	26 (54.2%)	
Diploma Degree	9 (37.5%)	15 (62.5%)	
Bachelor Degree	94 (57.7%)	69 (42.3%)	
Master's Degree	16 (51.6%)	15 (48.4%)	
Doctoral Degree	3 (75%)	1 (25%)	
Employment Status			
Employed	60 (48%)	65 (52%)	0.120
Unemployed	85 (57.4%)	63 (42.6%)	
Are you a health care provider			
Yes	32 (61.5%)	20 (38.5%)	0.176
No	113 (51.1%)	108 (48.9%)	

Significant factors affecting compliance with MOH schedule

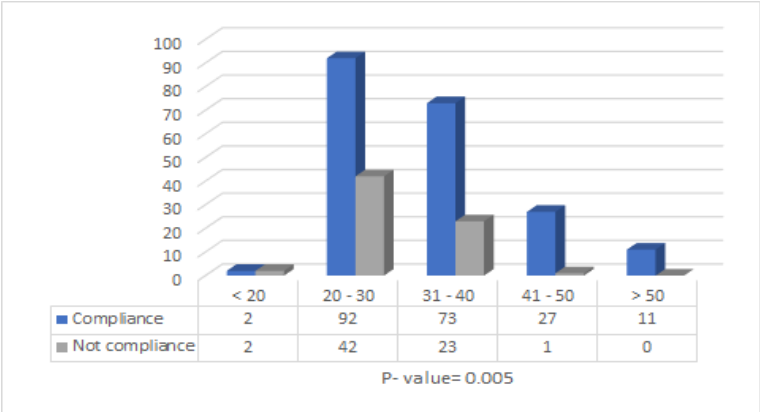

Figure 6: Significant relation between parent's age and compliance their children vaccination with MOH vaccine schedule with P-value = 0.005.

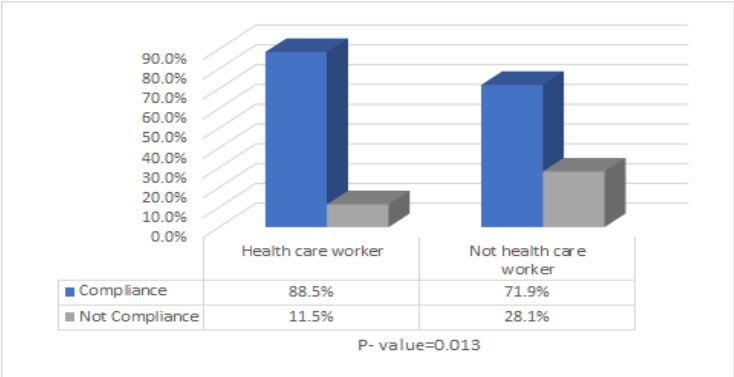

Figure 7: Significant relation between Healthcare worker parents and compliance their children vaccination with MOH vaccine schedule with P-value = 0.013.

Other Factors associated to parent's KAP

Most of the parents (34.5%) had their information regarding child vaccination from medical staff, followed by social media (21.9%) and friends (17.4%), while books (13.0%), then TV by (8.7%), and others source of information (4.5%). (Figure 8)

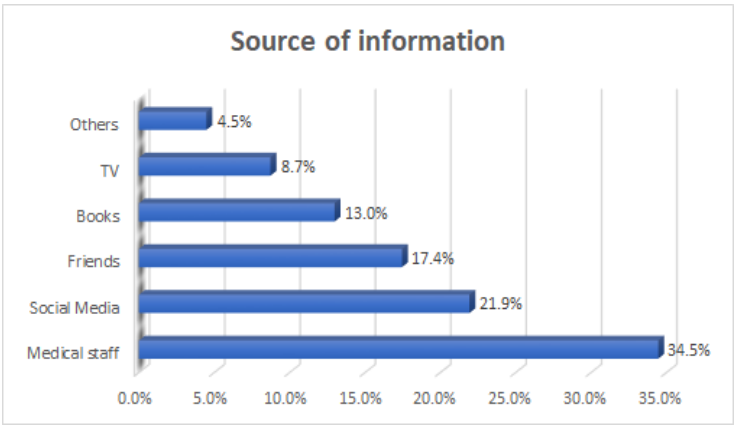

Figure 8: Source of information among parents about childhood vaccination.

Finally, Most the parents (39%) their reason for not or delay vaccinating their children was not available vaccine in primary health care centers, while 23% of them choose " I forget" (Figure 9).

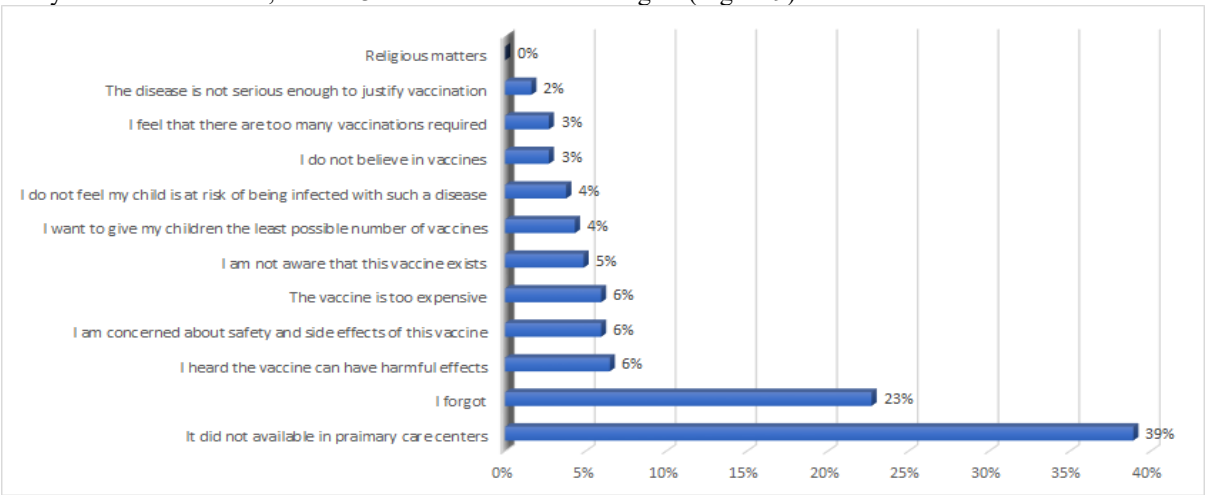

Figure 9: Parents' reasons for not or delay vaccinating their children.

DISCUSSION:

Majority of gender of the respondent were female representing approximately 84%, this could be justified by the fact that mothers are caregiver of their children and spend more time with their children than fathers [11].

Within the line with other study carried out in AlMadina, Parental age has played a role in the compliance of children to vaccination as the older parents were more knowledgeable and having higher positive attitude towards child vaccination than younger parents [3].

The present study showed that there's no significant association between parent's educational level and child vaccination knowledge and attitude. our result was not in line with a study conducted in Jeddah which revealed otherwise [11].

Based on our findings, majority of parents were aware that routine vaccination has an important role in protecting their children against infectious diseases and their complication and had a beneficial impact which exceeded their harm . In contrast to another study conducted in AlMadina which showed that only 40% consider vaccination are protective against diseases [3]. Studies have shown that parental knowledge regarding child vaccination played an important role and it had impacted their practice. Therefore, lack of knowledge is considered one of the main barriers to children vaccination [3,10,27].

Most vaccines in the childhood immunization schedule require two or more doses for development of an adequate and persisting antibody response [28,29]. In our study 79.1 % of parents correctly knew the importance of administration of multi dose vaccination of the same vaccine on different intervals. In contrast to the result of a study conducted in Taif which showed less number constituted in only 41 % [29].

CDC stated that giving several shots at the same time implies fewer office visits. This spares parents time and money and can be less traumatic for the child. Although only 34.1% of parents believed that there's no harm on giving more than one vaccine to the child at one time.

Only 23.8 % of parents consider common cold, diarrhea and otitis media are not contraindicated for vaccination. delay of immunizations based on misconception about contraindication puts infant or child at risk [29,30]. This may be effectively overcome by teaching the parents that such illnesses are not a reason to miss immunization [3,31].

Preconception of the parents that vaccination was an essential requirement for school registration and day care attendance [32,33]. This impacted on majority of parents of around 87% by ensuring that their children were compliant with MOH vaccination schedule and these results were consistent with a study conducted in AlMadina which noted that 85.7%believed that compliance with the MOH vaccination schedule is very important [3].

Overall the present study showed that approximately 57% or participants had adequate knowledge and it was revealed that there's a significant association between knowledge and attitude, those who had Adequate knowledge about child vaccination were more likely to have positive attitude towards it and vice versa. These results were not consistent with a previous study conducted in AlMadina which showed poor parental knowledge about vaccination [3].

Our study showed that medical staff are considered to be the main source of information among parents, this was consistent to other studies carried out in AlMadnia, Egypt, India Medical staff must be aware of parent's knowledge and awareness of their children's immunizations as it is one of the most critical points promoting vaccine acceptance by parents [3,10,34,35]. Advance work is required to extend doctor and immunizations provider's information in this area [32].

On assessment of parent's barrier to receive or delay completing vaccination schedule were attributed mainly to failure of PHC to provide vaccination and failure to remember. Lack of vaccination in PHC could be attributed to difficulty in storing the vaccine or reduced vaccine supply and distribution [35].

Failure to remember or recall could lead to missed visits, and missed opportunities, this could be the result of the lack of a system dedicated to collect and consolidate vaccination status of single individuals. This could be overcome by setting up an adequate system for recording vaccine administration and the activation of effective reminder/recall system as a way of expanding vaccination coverage [35].

Study limitation and strength

Our main study limitation was that we can't generalize our study results because it covers only the city of Mecca. however, that study was conducted in a city which is visited from Muslims all around the world to perform their religious obligation we also tried to find the factor that led to the high parents KAP. we also provided the participant a link to raise awareness about vaccination necessity.

CONCLUSION & RECOMMENDATIONS:

The study showed that parents have misguided knowledge and attitudes about some aspects of child immunization. There is a need to increase awareness and knowledge about the benefits and importance of vaccination, as well as the harmful consequences of non-complete immunization. A planned educational program is needed; the age of the parents needs to be taken into consideration when the program is planned. In addition to ensuring the availability of vaccinations in the primary health centers, which makes it easier for parents to reach them and also put a reminder service from the Ministry of Health to increase commitment and not forget to take vaccinations.

REFERENCES:

1. Jenner, E. 1801. The Origin of Vaccine Inoculation. London: Shury. Quoted in Fenner, Hall, and Dowdle 1998.
2. Curran D, Patterson B, Varghese L, et al. Cost-effectiveness of an Adjuvanted Recombinant Zoster Vaccine in older adults in the United States. *Vaccine*. 2018;36(33)
3. Omar Alfahl S, Alharbi KM. Parents'Knowledge, Attitude and Practice towards Childhood Vaccination, Medina, Saudi Arabia 2017. *Neonatal Pediatr Med*. 2017;03(01):1-8.
4. Ehreth J. The global value of vaccination. Vaccine. 2003;21(7–8):596–600
5. Al-Rukban MO, Al-Migbal TH, Al-Mutlaq AA, Al-Marshady MA, Al-Salhi AH, Al-Rsheed AA et al. (2005): Characteristics Of Immunization Providers In Riyadh And Their Self-Perception Of Competency. Journal of family & community medicine, 12: 35-41.
6. Memish ZA, Zumla A, Alhakeem RF, et al. Hajj: infectious disease surveillance and control. Lancet (London, England). 2014;383(9934):2073-2082. doi:10.1016/S0140-6736(14)60381-0 1.
7. Badahdah A-M, Rashid H, Khatami A, Booy R. Meningococcal disease burden and transmission in crowded settings and mass gatherings other than Hajj/Umrah: A systematic review. Vaccine. 2018;36(31):4593-4602. doi:10.1016/j.vaccine.2018.06.027
8. Saudi Ministry of Health
9. Dubé E, Laberge C, Guay M, Bramadat P, Roy R, Bettinger J. Vaccine hesitancy: An overview. Hum Vaccines Immunother. 2013;9(8):1763–73.
10. Awadh AI, Hassali MA, Al-Lela OQ, Bux SH, Elkalmi RM, Hadi H. Immunization knowledge and practice among Malaysian parents: A questionnaire development and pilot-testing. BMC Public Health. 2014;14(1)
11. Abdullah M, Zubaidi A, Alsudairy NM, Alzubaidi BA, Joharji R, Alqurashi SM, et al. Assessment of Knowledge and Attitude and Practice of Parents towards Epilepsy among Children in Jeddah City Statistical analysis. 2017;69(October):2685–9.
12. Hulsey E, Bland T. Immune overload: Parental attitudes toward combination and single antigen vaccines. Vaccine. 2015;33(22):2546-2550.
13. Brown K, Kroll J, Hudson M, Ramsay M, Green J, Long S et al. Factors underlying parental decisions about combination childhood vaccinations including MMR: A systematic review. Vaccine. 2010;28(26):4235-4248.
14. Mills E, Jadad A, Ross C, Wilson K. Systematic review of qualitative studies exploring parental beliefs and attitudes toward childhood vaccination identifies common barriers to vaccination. Journal of Clinical Epidemiology. 2005;58(11):1081-1088.
15. Falagas M, Zarkadoulia E. Factors associated with suboptimal compliance to vaccinations in children in developed countries: a systematic review. Current Medical Research and Opinion. 2008;24(6):1719-1741.
16. Harmsen I, Mollema L, Ruiter R, Paulussen T, de Melker H, Kok G. Why parents refuse childhood vaccination: a qualitative study using online focus groups. BMC Public Health. 2013;13(1).
17. Gust D, Brown C, Sheedy K, Hibbs B, Weaver D, Nowak G: Immunization attitudes and beliefs among parents: beyond a dichotomous perspective. Am J Health Behav 2005, 29:81–92.
18. Benin AL, Wisler-Scher DJ, Colson E, Shapiro EU, Holmboe ES: Qualitative analysis of mothers' decision-making about vaccines for infants: the importance of trust. Pediatrics 2006, 117:1532–1541.
19. Szilagyi PG, Hager J, Roghmann KJ, Doane C, Cove L, Rodewald LE, Humiston SG, Fleming GV, Hall CB: Immunization practices of pediatricians and family physicians in the United States. Pediatrics 1994, 94(4):517–523.
20. Orenstein WA, Atkinson W, Mason D, Bernier RH: Barriers to vaccinating preschool children. J Health Care Poor Underserved 1990, 1(3):315–330.
21. Hilton S, Hunt K, Petticrew M. Gaps in parental understandings and experiences of vaccine-

preventable diseases: a qualitative study. Child: Care, Health and Development. 2007;33(2):170-179.
22. Peckham, C., Bedford, H., Senturia, Y. & Ades, A. (1989) The Peckham Report: National Immunisation Study: Factors Influencing Immunisation Uptake in Childhood. Action for the Crippled Child, Horsham, UK.
23. Duffell E. Attitudes of parents towards measles and immunisation after a measles outbreak in an anthroposophical community. Journal of Epidemiology & Community Health. 2001;55(9):685-686.
24. Smailbegovic, M. S., Laing, G. & Bedford, H. (2003) Why do parents decide against immunization? The effect of health beliefs and health professionals. Child: Care, Health and Development, 29, 303–311.
25. Al-Lela OQB, Bahari MB, Al-Abbassi MG, Basher AY. Development of a questionnaire on knowledge, attitude and practice about immunization among Iraqi parents. J Public Health (Bangkok). 2011;19(6):497–503.
26. Alyami AR, Alhashan GM, Nasser IA, Alyami SR, Mardhamah NH Al, Alyami MH, et al. Knowledge , Beliefs and Practices of Parents towards Childhood Vaccination in Najran City , Saudi Arabia. 2018;70:1–7.
27. Favin M, Steinglass R, Fields R, Banerjee K, Sawhney M. Why children are not vaccinated: A review of the grey literature. Int Health [Internet]. 2012;4(4):229–38.
28. Centers for Disease Control and Prevention (U.S.). General recomendations on Immunization. Epidemiol Prev Vaccine-Preventable Dis. 2015;9–32.
29. Ahmed Abdulrahman YM. Parents′ Knowledge and Attitudes on Childhood Immunization, Taif, Saudi Arabia. J Vaccines Vaccin [Internet]. 2014;05(01):1–5.
30. Infectious P, Notes D. Jid11013. 2000;11(1):13–4.
31. CDC. Recommendations of the Advisory Committee on Immunization Practices (ACIP) Centers for Disease Control and Prevention. Mmwr [Internet]. 2011;60(2).
32. Qutaiba B Al-lela O, Bahari MB, Al-Qazaz HK, Salih MRM, Jamshed SQ, Elkalmi RM. Are parents' knowledge and practice regarding immunization related to pediatrics' immunization compliance? A mixed method study. BMC Pediatr. 2014;14(1).
33. Morrow AL, Rosenthal J, Lakkis HD, Bowers JC, Butterfoss FD, Crews RC, et al. A Population-based Study of Access to Immunization Among Urban Virginia Children Served By Public, Private, and Military Health Care Systems. Pediatrics [Internet]. 1998;101(2):e5–e5.
34. Joseph J, Devarashetty V, Reddy S, Sushma M. Parents' knowledge, attitude, and practice on childhood immunization. Int J Basic Clin Pharmacol [Internet]. 2015;4(6):1201–7.
35. Esposito S, Principi N, Cornaglia G. Barriers to the vaccination of children and adolescents and possible solutions. Clin Microbiol Infect [Internet]. 2014;20(S5):25–31.