

## Vaccine Hesitancy among Parents and its Determinants in PHC in Al Madinah City 2020

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### ABSTRACT

**Background:** Vaccine hesitancy is caused by a variety of factors, which are complex and multifaceted. The perceived risks of vaccines, the relationship between parents and health-care providers, and the social norm of vaccination are all factors that influence vaccine decision making.

**Objective:** This study aimed to conclude the prevalence of vaccine indecision amongst parents visiting PHC in Al-Madinah city, to identify socio-demographic determinants of vaccine hesitancy and to recognize agents and host-related factors, which leads to hesitancy. **Methods:** A cross-sectional research was implemented on parents who attended the PHC using a valid questionnaire filled by interviewing the parents. All data was confirmed manually then was implied and entered into SPSS software. Then the data were analyzed using the appropriate statistical test.

**Results:** Vaccines can protect children from dangerous diseases, according to 98.1% of the 375 people who took part in our study. 88.5% of parents preferred to get their children vaccinated with all of the vaccines that are recommended. 69.9% of participants had ever been hesitant or unwilling to have their child vaccinated. 9.6% of parents were unable to get their child vaccinated due to distance, clinic timing, time needed to get the clinic or wait at the clinic, and/or the cost of getting to the clinic.

**Conclusion:** Finally, our findings demonstrated that vaccine apprehension is a prominent issue among parents in Saudi Arabia. We discovered that vaccine fear is widespread, and that it spiked during the COVID-19 pandemic.

**Key words:** Vaccine hesitancy, Parents, Determinants, PHC, Al Madinah, Saudi Arabia.

### INTRODUCTION

Vaccine, unique of the most imperative encounters in the 20th century, helped to eliminate some infectious diseases, as well as to reduce the severity of others. Vaccine programs aid in the abolition of smallpox and poliomyelitis in the Americas, as well as the switch of measles, rubella, tetanus, diphtheria, hemophilus influenza type b, and additional transmittable illnesses in the United States and elsewhere <sup>[1]</sup>. The first vaccination was discovered in 1796 by Edward Jenner using cowpox to inoculate against smallpox, which led to worldwide eradication of smallpox in 1980 <sup>[2]</sup>.

A vaccine is a substance that encourages a person's immune system to create immunity against a certain disease, thus, protecting them from it. The vaccination is normally administered via needle, however it can also be administered orally or via nasal spray <sup>[3]</sup>. Vaccines mainly consist of an attenuated or attenuated version of a particular pathogen <sup>[4]</sup>. A vaccine is a biological agent that induces an immune response to a specific antigen derived from the pathogen causing an infectious disease <sup>[2]</sup>.

Vaccine helps the immunity system to fight against pathogens like viruses or bacteria. Protect against more than 25 diseases. The majority of children receive their vaccine on a specific time, while 20 million worldwide miss-out, making them at risk of that disease, life-threatening ill <sup>[5]</sup>. The Ministry of Health (MOH) started to design their own schedule, which can help the community of certain disease, these schedules include the vaccine recommended by the centers for Disease Control and

Prevention (CDC) to achieve the immunity among all the children and the community. These include; Polio, Rota, measles, mumps, Hemophilus influenza, Hepatitis A and B, Diphtheria, Tetanus, BCG, Pertussis, Pneumococcal Conjugate, Meningococcal Conjugate quadrivalent and Varicella <sup>[6]</sup>.

Unvaccinated individuals will put the community at risk of disease, which made the refusal and hesitancy to the vaccine as an emerging issue <sup>[7]</sup>. Hence the term "vaccine hesitancy" appeared to us and many studies had been conducted tried to study this phenomenon globally and find appropriate solutions to it. There is different definition with same concept describe this status. Vaccine hesitancy is a postponement in accepting or refusing vaccinations notwithstanding the convenience of immunization facilities. Vaccine procrastination is multifaceted and context-specific, changing over time, place, and vaccine type. It is prejudiced by issues such as complacency, convenience and confidence <sup>[8]</sup>.

Vaccination reluctance is defined as a set of beliefs, attitudes, behaviors, or a blend of these, expressed by non-professionals about immunizing themselves or their children, and sometimes by health care professionals <sup>[9]</sup>. It acknowledges a continuum among the domain names of vaccine attractiveness and vaccine refusal and depolarizes preceding characterization of people and agencies as both anti-vaccine or pro-vaccine <sup>[10]</sup>.

Vaccine hesitancy was considered as one of the ten most important threats to public health, due to the lack of vaccination and exposure of children and adults who are

targeted for diseases related to vaccination, in addition to the reduced level of vaccination coverage <sup>[1]</sup>. The causes can be described by the epidemiological triad i.e. the environmental- (i.e. external), agent- (i.e. vaccine) and host (or parent) - specific factors <sup>[11]</sup>, or may be categorized in three: lack of confidence (in effectiveness, safety and the system), complacency, and lack of convenience (in the availability, accessibility, and appeal of immunization services, including time, place, language, and cultural contexts) <sup>[12]</sup>. What we get as a result of invasive Hemophilus influenzae type b sickness, varicella, pneumococcal disease, measles, and pertussis outbreaks, which cause unnecessary suffering in young children and waste limited public health resources <sup>[13]</sup>. Since 2018-2019, the United States and Canada are facing rapidly spreading measles virus outbreak. The causative agent mainly from global travelers, and from immunocompromised individual, affect all the children with this none or incomplete vaccines. Outbreak almost due to a lack of vaccination, or an incomplete dosage of measles <sup>[14]</sup>. In the United States, **Yunmi, et al.** <sup>(15)</sup> conducted a study on immunization decision-making among US parents. The study was conducted using web-based surveys in 2012 (n = 2603) and 2014 (n = 2518) and targeted parents with children under the age of seven. Results: Acceptors were more likely than delayers and refusers to know someone whose child had a serious reaction to a vaccine or had a vaccine delayed or denied (s). High percentages of vaccination delayers (33.4% in 2012 and 33.9% in 2014) and refusers (49.6% in 2012 and 58.6% in 2014) even chose the healthcare provider that permits them to delay or reject vaccines. Trust and communication, as well as varied degrees of personal-network impacts, are likely to influence parents' immunization decisions, according to Practice Provider's results. Vaccine-skeptical parents frequently seek out providers.

**Giambia et al.** <sup>(16)</sup> conducted a countrywide survey in Italy to investigate parental vaccine hesitancy. A total of 3130 questionnaires were evaluated, with 83.7% of parents supporting vaccination, 16.3% opposing vaccination. The main source of concern was vaccine safety, which was cited by 38.1% of respondents as the primary reason for refusing or interrupting (42.4%) immunization. Anti-vaccine and reluctant parents are much more concerned about short-term (85.7 and 79.7% versus 60.4%) and long-term (95.2 and 72.3% vs 43.7%) vaccination adverse responses than pro-vaccine parents. Most pro-vaccine and reluctant parents (96.9% and 83.3%, respectively) considering family pediatricians as a reputable source of information, compared to 45% of anti-vaccine parents. The lack of receiving from a pediatrician was revealed to be one of the key factors related with hesitancy <sup>[16]</sup>.

### **Study Rationale:**

The researcher has a special interest on public health especially immunization and population believe and attitude towards it. The researcher had observed some misconceptions among the parents regarding the safety of the vaccine, availability, easy access and crowded immunization clinic in the primary health care (PHC) center.

### **Study Objective:**

To determine the prevalence of vaccine hesitancy among parents visiting PHC in Al-Madinah city and to determine the prevalence of vaccine hesitancy. The study also aimed to identify socio-demographic determinants of vaccine hesitancy and to recognize agents and host-related factors, which lead to hesitancy.

## **PARTICIPANTS AND METHODS**

**Study Design:** A Cross-sectional study

**Study Area:** Al-Madinah al-Munawara is the capital of the Al-Madinah Region in Saudi Arabia located in the western region in Saudi Arabia. It has a population of (1.152.991) depending on the general authority for statistics and based on a demographic survey done in 2010, number of Saudis among this population was 759.499 (65.87%) and the non-Saudi 393.492 (34.13%). This makes this society distinguishable by the diversity of races and the difference of cultural backgrounds among its residents. Around 45 PHC centers are distributed geographically all over the city.

**Study Population:** Parents who are visiting the PHC in Al-Madinah city.

**Inclusion Criteria:** All parents who have children less than 5 years (Saudi and non-Saudi)

**Exclusion Criteria:** Singles. Parents who don't have preschool children. Parents with children who have contraindication for some vaccine.

**Sample Size:** It is calculated by Raosoft website, the margin of error: 5%, worst acceptable: 50 %, confidence interval: 95%, the calculated sample size was: 384, we increased the sample size to 500 to ensure getting above than 80% response rate.

**Sampling technique:** Multistage Stratified Systematic Simple Random Sampling.

- 1st stage

Al-Madinah was divided into 4 regions based on the geographical distribution. North, south, east and west region

- 2nd stage

From each region, two centers were chosen randomly. Making a total of eight centers.

- 3rd stage

From each center, every second patient was interviewed.

**Study Tool:** A valid questionnaire was filled by interviewing the parents by the researcher and two

assistants (medical students), who were trained on each aspect of the survey and participated in the pilot study. It consisted of two parts: The first one focused on socio-demographic study, and the second contained the 11 elements survey of the strategic advisory group of experts on immunization (SAGE) [13].

**Statistical analysis:**

All data were verified by the hand then was coded and entered into SPSS software. Then the data were analyzed using the appropriate statistical test. Categorical data was analyzed using the chi-square test and T-test for numerical data. The result was statically significant if P value ≤ 0.005).

**Pilot Study:** Before the study commencement, a pilot study was conducted on a sample of 10 participants with similar criteria to test the accessibility and the time required to fill the questionnaire and to ensure that the participants were understanding the questions. And this sample, which we used in the pilot study was excluded from the study.

**Ethical Consideration:**

The proposal was submitted for ethical approval by The Research Committee in Al-Madinah. Then, it was approved from General Directorate of Health Affairs of Madinah. After that we took permission from each primary health care center to make the interview. All the participant was informed of their rights to participate or not and their information was kept confidential, only used for this study and anonymous. In addition a written consent was obtained from every participant.

**RESULTS**

Of all 375 participants included in our study, 66.1% were males and 33.9% were females. 53.9% had school degree (secondary, primary, elementary), 34.9% had bachelor degree and 11.2% had higher education. 55.7% of participants had 1- 3 children, 27.5% had 4- 6 children and 16.8% had more than 7 children. The age of the youngest child was reported as 5 years or less in 82.7% and more than 5 years in 17.3% of participants. Immunization case of the young child was full in 67.5% and partial in 32.5% (Table 1).

**Table (1):** Sociodemographic Participants' features (1) and the youngest child's immunisation status (n=375)

Parameter		No.	%
Gender	Male	248	66.1
	Female	127	33.9
Education level	School (secondary, primary, elementary)	202	53.9
	Bachelor degree	131	34.9
	Higher Education	42	11.2
Number of children	1-3 kids	209	55.7
	4-6 children	103	27.5
	More than 7 children	63	16.8
The age of the youngest child	5 years and younger	310	82.7
	More than 5 years old	65	17.3
Vaccination status of the youngest child under the care of the study sample	Fully vaccinated at this age	253	67.5
	Partially vaccinated at this age	122	32.5

Table (2) illustrated that 98.1% of participants think that vaccines could defend offspring from thoughtful ailments. 88.5% like to get their kids inoculated with wholly the endorsed vaccines. 69.9% of participants ever been unwilling or reluctant to get his child vaccinated (2.7% of them did not reflect the vaccine is harmless/anxious round side effects, or caught or read about vaccine negativity from the media and 3.4% can't leave work). Distance, timing of the clinic, the time needed to get to the clinic or wait at the clinic and/or the costs of getting to the clinic prevented 9.6% of parents from getting their child vaccinated. 10.4% reported other stresses that prevent vaccinating child on time (17.9% due to formalities, 61.5% due to job and 20.5% due to corona virus pandemic). 4% reported difficulty for some ethnic or religious groups in community/area to get their children vaccinated as health services don't reach them. 12% received or heard negative information about vaccination (but 95.6% of them still seek for vaccinating their children).

**Table (2):** Participant’s knowledge and barriers to vaccines reported among parents (n=375)

Parameter	No.	%	
<b>Vaccines could keep children as of thoughtful illnesses</b>	Yes	368	98.1
	No	7	1.9
<b>Furthermost parents prefer to grow their children protected with wholly the commended vaccines</b>	Yes	332	88.5
	No	43	11.5
<b>Ever been unwilling or reluctant to get your child vaccinated</b>	Yes	262	69.9
	No	113	30.1
<b>If the previous answer is (yes), what is the reason(s) (bias occur)</b>	Don't think the vaccine is safe/concerned about side effects, o heard or read about vaccine negativity from the media	7	2.7
	Can't leave work (at home or otherwise)	9	3.4
	other	246	93.9
<b>Your child will not be vaccinated because of distance, time to clinic, length of time it takes to get to or wait at clinic, and/or cost of transportation to clinic.</b>	Yes	36	9.6
	No	339	90.4
<b>If the answer is yes, explain</b>	Job	8	22.2
	Forgetting an appointment	7	19.4
	other	21	58.3
<b>Other stresses that prevent vaccinating child on time</b>	Yes	39	10.4
	No	336	89.6
<b>If yes, explain</b>	formalities	7	17.9
	a job	24	61.5
	Corona	8	20.5
<b>It is problematic for certain ethnic or spiritual clusters in community/area to get their kids immunized</b>	Yes	15	4.0
	No	360	96.0
<b>If the previous answer was (yes), because:</b>	Health services don't reach them	15	100.0
<b>Heard adverse facts around immunization</b>	Yes	45	12.0
	No	330	88.0
<b>If the previous answer was (yes), explain</b>	Corona	3	6.7
	cause autism	42	93.3
<b>If yes, still taking your child for vaccinations after hearing the negative information</b>	No	2	4.4
	Yes	43	95.6

Table (3) showed that, 66.1% reported that administrators support infant and child vaccinations, 69.9% reported that religious support infant and child vaccinations, 69.9% reported that politicians support infant and child vaccinations, 73.6% reported that gurus support infant and child vaccinations, and 69.9% reported that health care workers support infant and child vaccinations. Only 5.6% of participants refused to vaccinate a child before (33.3% of them because of side effects of vaccine, 33.3% because of disability, and 33.3% because of autism).

**Table (3):** Barriers to vaccine and vaccination status of participants’ children (n= 375)

Parameter		No.	%
Administrators support infant and child vaccinations	Yes	248	66.1
	No	127	33.9
Religious support infant and child vaccinations	Yes	262	69.9
	No	113	30.1
Politicians support infant and child vaccinations	Yes	262	69.9
	No	113	30.1
Gurus support infant and child vaccinations	Yes	276	73.6
	No	99	26.4
Health care workers support infant and child vaccinations	Yes	262	69.9
	No	113	30.1
Ever refused to vaccinate child	Yes	21	5.6
	No	354	94.4
If yes, explain	Side effects of the vaccine	7	33.3
	disability	7	33.3
	cause autism	7	33.3

There was a substantial link between vaccination case of the youngest child with gender of parent, educational level, total number of children and age of the last child (Table 4).

**Table (4):** Association between participants sociodemographic and vaccination status of the youngest child

		Vaccination status of the youngest child under the care of the study sample		Total (N=10 20)	P value
		Fully vaccinated	Partially vaccinated		
Gender	Male	177	71	248	<b>0.024</b>
		70.0%	58.2%	66.1%	
	Female	76	51	127	
		30.0%	41.8%	33.9%	
Education level	School (secondary, primary, elementary)	21	21	42	<b>0.002</b>
		8.3%	17.2%	11.2%	
	Bachelor of	151	51	202	
		59.7%	41.8%	53.9%	
	Higher Education	81	50	131	
		32.0%	41.0%	34.9%	
Number of children	1-3 kids	116	93	209	<b>0.001</b>
		45.8%	76.2%	55.7%	
	4-6 children	82	21	103	
		32.4%	17.2%	27.5%	
	More than 7 children	55	8	63	
		21.7%	6.6%	16.8%	
The age of the youngest child	5 years and younger	202	108	310	<b>0.037</b>
		79.8%	88.5%	82.7%	
	More than 5 years old	51	14	65	
		20.2%	11.5%	17.3%	

**DISCUSSION**

In our study, 98.1% of participants think that vaccines could defend offspring from thoughtful ailments. 88.5% like to get their kids inoculated with wholly the endorsed vaccines. 69.9% of participants ever been unwilling or reluctant to get your child vaccinated

(2.7% of them did not reflect the vaccine is harmless/anxious round side effects, or caught or read about vaccine negativity from the media and 3.4% could not leave work). In Riyadh city, research has been conducted by Dr. **Sara Alsubaie et al.** <sup>(17)</sup> at King Khalid University Hospital, Riyadh, Kingdom of Saudi Arabia,

between July 2017 and October 2018. The research was done by interviewing the parents at the outpatient clinic using 11 elements SAGE-vaccine hesitancy survey- was found. 20% of parents were hesitant to get their child vaccinated. The parents with higher education level were more hesitant ( $p < 0.001$ ). Among hesitant parents, 36% of children were not fully vaccinated. The most frequent reasons for hesitancy were vaccine safety or ineffectiveness. Another classic study was held at the 7-second school of Makaka City, Saudi Arabia in 2017 by **Rana Albarakati *et al.*** <sup>[18]</sup> via an electronic survey distributed to 100 parents with children aged 2 months – 17 years. This study showed that many parents agreed about the importance of the vaccines that helped in protecting the child from the disease, and spreading infectious diseases between the community members. Most parents (68.7%,  $P < 0.05$ ) reported full child immunization, while the remaining one third (31.3%,  $P < 0.05$ ) showed some hesitation. Another cross-sectional study was done by Alshammari *et al.* was found that A majority (78.9%) of the respondents were aware of pediatric vaccination, and children under 5 years of age were compulsorily vaccinated (86.2%) <sup>[19]</sup>. In another study, the sample was 589 parents, the majority (81%) reported that their child had received all doses of recommended vaccines and 40% of parents having hesitated to the vaccine <sup>[20]</sup>.

In contrast in 2019, a study on vaccine hesitancy among parents was conducted by the WHO in Saudi Arabia, and collected data showed that up to 20% of the 500 parents were hesitant to have their children vaccinated <sup>[21]</sup>.

In our findings, 12% received or heard negative information about vaccination (but 95.6% of them still seek for vaccinating their children). Reading, internet browsing, and social media were the most frequently cited sources of anti-vaccine sources, accounting for around 67% of participant' sources, compared to the Riyadh study, which found that a majority (56%) of participants depended on the internet and social media <sup>[22]</sup>. A study that was conducted in Riyadh found that a major factor associated with parental hesitation and incomplete immunization status was the belief that vaccines were not important <sup>[23]</sup>. Another study showed that the most frequent reasons for the hesitance were lack or no vaccines in primary care centers, fear of adverse effects and vaccine safety. While some parents noticed the crowded vaccination schedule as one of the reasons <sup>[18]</sup>. In another study, the most frequent reasons were fear of adverse effects and low perceived vulnerability of the child or severity of the disease <sup>[20]</sup>.

In our study, 66.1% reported that administrators support infant and child vaccinations, 69.9% reported that religious support infant and child vaccinations, 69.9% reported that politicians support infant and child

vaccinations, 73.6% reported that gurus support infant and child vaccinations, and 69.9% reported that health care workers support infant and child vaccinations. Recognizing vaccination as a social norm can be a strong driver of vaccine acceptance. In many studies, the importance of subjective norms, or the fact that people around you are vaccinated, or that your child is vaccinated, is a factor related to vaccination. Social pressure to get vaccinated may also be a result of social norms <sup>[24]</sup>.

## CONCLUSION

In conclusion, our findings showed that vaccine hesitancy is a major concern among parents in KSA, posing a risk to the country's currently high vaccination rate. Low awareness of vaccines is a major public health threat, especially during epidemics such as COVID-19. We find that concerns about vaccination are quite high and that concerns have intensified during the COVID-19 pandemic. As a result, education and information campaigns and public health intervention programs are important.

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