

Evaluation of Vaccine Hesitancy in Tabuk Population, Saudi Arabia

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ABSTRACT

Introduction: Vaccine hesitancy is a significant problem worldwide. Recent studies reported an increasing safety concerns and lack of confidence in the vaccination programs. The objectives of this study are to explore the perception of immunization and to investigate the prevalence of vaccine hesitancy in Tabuk population.

Methods: A cross-sectional study was carried out in five primary schools in Tabuk city, Saudi Arabia. A self-administered questionnaire about parental perception and attitudes towards immunization was sent with each school pupil, to be filled by one of his parents at home and then to be returned on the next day. The questionnaire responses were analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA) version 20.

Results: About 7% of the parents decided not to have their child get a shot for reasons other than illness or allergy, and 23% reported a delayed vaccination. About 64% of fathers and 48% of mothers believe that it is better for children to develop immunity by getting sick than by getting shots ($p = 0.002$). Concerns about shot-induced side effects were higher among fathers (69%) than mothers (54%); $p = 0.003$. Vaccine hesitancy is not related to gender, educational attainment or

parental income. The parents who have safety concerns are more likely to report vaccination delay, missed doses, and wrong beliefs about vaccine efficacy compared to those who are not ($p < 0.05$).

Conclusion: Vaccine hesitancy is a common problem in Tabuk City. Health education programs are recommended to increase awareness of the community about the importance of immunization.

Key words: Vaccine, Hesitancy, Parents, Children

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INTRODUCTION

In spite of the accumulating evidence about the valuable role of vaccines in preventing many disabling diseases and in saving the lives of millions of children every year, vaccine hesitancy remains a problem in many countries worldwide.¹⁻³ Vaccine hesitancy is defined as "a delay in acceptance or refusal of vaccination despite availability of vaccination services. Vaccine hesitancy is complex and context specific, varying across time, place, and vaccines. It is influenced by factors such as complacency, convenience and confidence".⁴ It is worth noting that the practice of vaccine delays or refusal can be considered as a major health concern because it increases the risk of vaccine disease outbreaks that may result in serious morbidities and mortalities. Previous researches showed that the variable reasons and expressions of vaccine hesitancy need to be investigated and properly addressed.⁵⁻⁷ Researchers are advised to focus on the sub-groups within populations who are hesitant about vaccination, the possible reasons that drive their hesitancy, their geographical locations, and the possible socio-cultural or political context that may be contributing to their hesitancy.

The National Immunization Schedule of Saudi Arabia offers 37 doses of immunizations for 15 different microorganisms that cause various childhood diseases. The majority of these doses should be given during the first 2 years of life, and few of them are given at the school age. Every pupil should be fully immunized for his/her age before registration to a kindergarten or a school. Unfortunately, there is a paucity of data regarding parental perception of vaccination and the expression of vaccine hesitancy in Saudi Arabia. The objectives of this study are to explore the general knowledge and perception of immunization and to investigate the prevalence of vaccine hesitancy among Tabuk population- Saudi Arabia.

METHODS

We have conducted a descriptive cross-sectional study in five primary schools in Tabuk city, Saudi Arabia. The study was conducted during the period from January to May 2016. The schools were selected by random sampling. Sampling was stratified for the different geographical areas of the city. The

sample size was calculated based on the formula ($n = Z_{1-\alpha}^2 P(1-P)/d^2$), where n = sample size = 384, Z = standard normal variate = 1.96 (at 5% type I error, $p = 0.05$), P = expected proportion = 50%, and d = precision error = 5%. Additional 20 % was added to cover the missing data. The total sample obtained was 460. All the pupils in these schools were approached to obtain the desired sample size. A self-administered questionnaire, previously validated,⁸ about vaccine hesitancy was sent with each pupil to his parents, to be filled by one of them and then to be returned back on the next day. A letter that explains the objectives of the study and asks for parental consent was sent with the questionnaire. The questionnaire requires information about parental opinion

about immunization, their trust in vaccination, their attitudes towards it, and their beliefs in vaccine safety and efficacy.

The questionnaire responses were analyzed using the Statistical Package for the Social Science (SPSS Inc. Chicago, IL, USA) version 20. Categorical variables were described by frequencies and percentages. Descriptive analysis involving Chi-square test was used to test significance of association between categorical variables. The level of significance was set at $P < 0.05$. The research was approved by the local Research Committee of the Faculty of Medicine, University of Tabuk. Official letters were sent to the selected primary schools. Parents of the pupils were asked to give their written consents before participation in the study.

Table 1: General characteristics of the participants (n= 460)

Character		
Age	Mean (SD) (y)	38.7 (7.6)
	Range (y)	22 - 64
Gender	Male (n (%))	344 (75%)
	Female (n (%))	116 (25%)
Education	Not educated (n (%))	006 (1%)
	Primary/ secondary (n (%))	102 (22%)
	Graduate (n (%))	352 (77%)
Income	Poor (n (%))	086 (19%)
	Average (n (%))	340 (74%)
	High (n (%))	034 (7%)

Table 2: A comparison of fathers' and mothers' attitude and perception regarding the vaccination schedule for children

Attitude/ Perception	Male n= 344	Female n= 116	P- value
▪ Delayed having his child get a shot for reasons other than illness or allergy	80 (23%)	27 (23%)	0.996
▪ Decided not to have his child get a shot for reasons other than illness or allergy	28 (8%)	6 (5%)	0.291
▪ Sure that following the recommended shot schedule is a good idea for his child	325 (94%)	110 (95%)	0.616
▪ Believes that the illnesses that shots prevent are severe	301 (88%)	96 (83%)	0.199
▪ Believes that it is better for his child to develop immunity by getting sick than by getting a shot	221 (64%)	56 (48%)	0.002
▪ Believes that it is better for children to get fewer vaccines at the same time	83 (24%)	18 (16%)	0.053
▪ Concerned that his child might have a serious side effect from a shot	236 (69%)	63 (54%)	0.003
▪ Concerned that one of the childhood shots might not be save	228 (66%)	68 (59%)	0.046
▪ Believes that the information he receives about vaccines from the vaccine programmers reliable and trustworthy	305 (89%)	93 (80%)	0.012
▪ Believes that his child/children does or do not need vaccines for diseases that are not common anymore	105 (31%)	34 (29%)	0.021

RESULTS

Table 1 shows general characteristics of the participants. Age ranged from 22 to 64 years old, with a mean (SD) of 38.7 (7.6). The majority was males (75%), and university graduates (77%). Table 2 shows a comparison in attitude and perception of vaccination schedule between fathers and mothers in the study group. About 8% of fathers and 5% of mothers decided not to get a shot for reasons other than illness or allergy. Equal percentages (23%) of both delayed the vaccination. A higher percentage of fathers (64%) than mothers (48%) believe that it is better for children to develop immunity by getting sick than by getting shots ($p = 0.002$). More than two thirds of fathers (69%), compared to 54% of mothers, are concerned that their children might have

serious side effects from vaccine shots (0.003). The majority of both parents (89% fathers and 80% mothers) believe that the information they receive about vaccines from the vaccine programmers is reliable and trustworthy. Table 3 shows that vaccine hesitancy has no relation to gender, education or income. Table 4 shows significant relation between the parental educational attainment and many aspects of their attitude and perception regarding the vaccination schedule ($p < 0.05$).

Table 5 shows that those who are concerned about shot induced side effects have higher percentages of vaccination delay, missed doses, hesitancy, and wrong believe about vaccine efficacy compared to those who are not ($p < 0.05$).

Table 3: Hesitancy about the vaccination schedule for children in relation to gender, education and income of the parents

		Hesitant n= 101	Not hesitant n= 359	P-value
Gender	Male (n= 344)	82 (24%)	262 (76%)	0.198
	Female (n= 116)	19 (16%)	97 (84%)	
Education	Not educated (n= 6)	1 (17%)	5 (83%)	0.539
	Primary-secondary (n= 102)	21 (21%)	81 (79%)	
	Graduate (n= 352)	79 (22%)	273 (78%)	
Income	Low (n= 86)	21 (24%)	65 (76%)	0.374
	Average (n= 340)	75 (22%)	265 (78%)	
	High (n= 34)	5 (15%)	29 (85%)	

Table 4: The attitude and perception of the parents in relation to their educational attainment

Question	Not educated n= 6	Not graduated n= 102	Graduated n= 352	P-value
▪ Delayed having his child get a shot for reasons other than illness or allergy	3 (50%)	18 (18%)	86 (24%)	0.060
▪ Decided not to have his child get a shot for reasons other than illness or allergy	0 (0%)	6 (6%)	28 (8%)	0.647
▪ Sure that following the recommended shot schedule is a good idea for his child	5 (83%)	97 (95%)	333 (95%)	0.596
▪ Believes that the illnesses that shots prevent are severe	5 (83%)	89 (87%)	303 (86%)	0.755
▪ Believes that it is better for his child to develop immunity by getting sick than by getting a shot	2 (33%)	65 (64%)	210 (60%)	0.008
▪ Believes that it is better for children to get fewer vaccines at the same time	1 (17%)	32 (31%)	68 (19%)	0.031
▪ Concerned that his child might have a serious side effect from a shot	6 (100%)	67 (66%)	226 (64%)	0.040
▪ Concerned that one of the childhood shots might not be save	4 (67%)	70 (69%)	222 (63%)	0.001
▪ Believes that the information he receives about vaccines from the vaccine programmers reliable and trustworthy	5 (83%)	89 (87%)	304 (86%)	0.848
▪ Believes that his child/children does or do not need vaccines for diseases that are not common anymore	4 (67%)	39 (38%)	96 (27%)	0.027

Table 5: The attitude and perception of the parents in relation to concerns about shot-induced serious side effects

Attitude/ Perception	Concerns about shot-induced side effects		P-value
	Concerned n= 299	Not concerned n= 161	
▪ Delayed having his child get a shot for reasons other than illness or allergy	80 (27%)	27 (17%)	0.008
▪ Decided not to have his child get a shot for reasons other than illness or allergy	33 (11%)	1 (0%)	0.000
▪ Sure that following the recommended shot schedule is a good idea for his child	278 (93%)	157 (98%)	0.000
▪ Hesitant about childhood shots	80 (27%)	21 (13%)	0.000
▪ Believes that it is better for his child to develop immunity by getting sick than by getting a shot	175 (59%)	102 (63%)	0.483
▪ Believes that it is better for children to get fewer vaccines at the same time.	80 (27%)	21 (13%)	0.003
▪ Concerned that one of the childhood shots might not be save	237 (79%)	59 (37%)	0.000
▪ Concerned that a shot might not prevent the disease	214 (72%)	51 (32%)	0.000
▪ Know someone who has had a bad reaction to a shot	96 (32%)	26 (16%)	0.001
▪ Believes that childhood vaccines are effective	270 (90%)	155 (96%)	0.000
▪ Believes that the information he receives about vaccines from the vaccine programmers reliable and trustworthy	252 (84%)	146 (91%)	0.021
▪ Believes that his child/children does or do not need vaccines for diseases that are not common anymore	102 (34%)	37 (19%)	0.003

DISCUSSION

Vaccine hesitancy is a global problem that requires national attention and ongoing monitoring. In this study, although 95% of the parents agreed that vaccination is suitable for children protection against vaccine preventable diseases, nearly two thirds of them are concerned about shot-induced side effects. Similar findings were reported in other countries; with additional concerns about number of vaccine doses and route of administration.^{9,10} In our study, only 4.8% of the parents believe that their children received too many vaccines. It is argued that as vaccines reduce disease occurrence, the lack of disease makes vaccination unnecessary.⁶ Based on our findings, about 30% of parents in Tabuk city believe that their children do not need vaccination for diseases that are not common any more. On the other hand, 60 % believe that it is better for their children to develop immunity by getting sick rather than by being vaccinated. Similar findings were recently reported.¹¹ It is worth noting that the ultimate effect of vaccination is to reduce incidence and prevalence of the targeted disease. Otherwise, people may lose confidence in the vaccine and this may result in vaccine refusal. A recent study during an outbreak of pertussis in the United States showed that parents did not increase pertussis vaccine uptake in spite of an increase in pertussis cases.¹²

In contrast to a previous study that reported higher concerns of women about serious adverse effects of vaccination compared to men (60% vs. 46%; $p=0.0007$),⁹ our study showed that the fathers were more concerned about complications of vaccination compared to the mothers (69% vs. 54%; $p=0.003$).

The concerns and the wrong believes about possible complications of vaccination were likely to be responsible for vaccination delay, refusal of vaccination and wrong believes about efficacy of the vaccines. As a confirmation for this, we found a significant relation between vaccine hesitancy and concerns about shot-induced side effects. It is worth noting that, concerns about vaccine safety has been recently reported as a common reason for vaccine hesitancy in many studies.¹³⁻¹⁵ Other reasons were classified into religious reasons, personal beliefs or philosophical reasons.¹⁵

The healthcare providers represent an important source of information that get parents accept vaccination for their children and believe in the vaccine efficacy and safety. A trusting relationship between the parents and the healthcare practitioners is essential for this purpose.¹⁶ In our study, most of the parents believe that the vaccine information they receive from the healthcare providers is reliable and trustworthy. Similarly, the role of the health authorities and the government in maintaining this trust is invaluable and has to be acknowledged.¹⁷

In conclusion, vaccine hesitancy exists in a considerable percentage of Tabuk population. The overall hesitancy has an insignificant relation to gender, educational attainment and income. There is a significant relation between the parental concerns about shot induced side-effects and the vaccination delay, missed doses, and hesitancy. The father's safety concerns are higher than those of the mother's.

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