



Knowledge, Attitude and Beliefs of Caregivers of Children below 2 Years of Age towards Immunization

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Authors' contributions

This work was carried out in collaboration between all authors. Author NAEM designed and put the idea of the study, performed the statistical analysis, wrote the protocol, revised the manuscript. Authors RMH and NE managed the analyses of the study, wrote the manuscript and managed the literature searches. The other authors EM, FA, MS and SH were responsible for data collection. All authors read and approved the final manuscript.

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ABSTRACT

Aim: To determine the knowledge, attitude and beliefs of children below 2 years' caregivers towards immunization in an Egyptian community, to detect of the underlying causes of vaccination delay, and to determine their satisfaction regarding aspects of care.

Methodology: This cross sectional study was carried out on caregivers attending immunization setting in 5 urban and rural health facilities in Mansoura district, Egypt. They fill the questionnaire that asks about, Socio-demographic characteristics and different factors related to their attitude towards immunization.

Results: The study included 1000 caregiver in the study. We found that no caregiver refused to immunize his children and 10% only delayed their immunization which was mainly due to deficient information about the importance of vaccination. Caregivers who delayed vaccines compared with caregivers who regularly vaccinated their children were

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less likely to believe that vaccines are necessary to protect the health of children (91% vs. 99.3%, $p < 0.001$), that their child might get a disease if they aren't vaccinated (72% vs. 83.3%, $p < 0.001$), to read and watch stories about health (93% vs. 100%, $p < 0.001$), to agree with the statement, "vaccines are safe" (85% vs. 100%, $p < 0.001$), to believe that they had a good relationship with their child's health-care provider, (85% vs. 100%, $p < 0.001$). At the same time, they reported lower satisfaction regarding different aspects of care except for insurances of proper vaccine administration.

Conclusion: Vaccination is one of the most effective public health interventions. Uptake of vaccination services is dependent not only on the quality of these services but also on other factors including knowledge and attitude of the parents. In this study we found that no one refused to immunize his children and the frequency of delayed vaccination was 10%. This delay was mainly due to insufficient information about the importance of vaccination, child illness, negative knowledge about the vaccines and vaccine deficiency. Health education programs is needed to explain different vaccines related worry together with improving different aspects of care that enhances caregivers satisfaction.

Keywords: Knowledge; attitude; caregivers; immunization.

1. INTRODUCTION

Vaccination is considered as one of the most effective public health interventions worldwide. Thanks to vaccination a number of serious childhood diseases have been successfully eradicated [1]. The WHO recommends vaccination against a number of serious infectious diseases, including diphtheria, tetanus, pertussis, HBV, measles, pneumococcal disease, yellow fever, and rotavirus disease for children in some areas as part of their EPI [2]. Despite increase in global immunization coverage, many children around the world especially in developing countries are left unimmunized. In 2007, approximately 27 million infants worldwide were unimmunized against common childhood diseases and 2-3 million children died of vaccine preventable diseases [3]. Globally, immunization coverage for diphtheria, tetanus and pertussis has increased during the past decade to about 78% [4]. Over the past years, the Egyptian Ministry of Health and Population (MOHP) has implemented a national program for childhood immunization. Health authorities in Egypt have also taken important steps to maintain high levels of immunization coverage among children through routine immunization and implementation of supplementary immunization activities [5,6].

Parental satisfaction with pediatric care is an indicator of provider quality. Research on parental health beliefs and attitudes often assumes that parents decline immunization or are simply less knowledgeable and persistent in the health care setting. This misperception was partially due to ignoring the fact that some parents lack access of well-child care [7]. The four psychosocial domains that influence parents' decisions to vaccinate their children are: susceptibility; seriousness; efficacy and safety and social pressures. These factors soon became the basis for the celebrated Health Belief Model. It has been used throughout public health to explain why people adopt behaviors that lead to healthy lives [8,9].

Our study was conducted to determine the knowledge, attitude and beliefs of children below 2 years' caregivers towards immunization in an Egyptian community, to detect the underlying causes of vaccination delay, and to determine their satisfaction regarding aspects of care.

2. METHODOLOGY

This cross sectional study was carried out for three months from March 2012 to May 2012. Sample size was calculated using DSS sample size calculator online (www.dssresearch.com). A pilot study was done on 50 caregivers in order to test the questionnaire, detect any difficulties and also to give an idea about the prevalence about delaying and refusal of child immunization, from which the percent of vaccination delay was found to be 11.5 % and by considering the worst acceptable value as 8.5, the sample size was 613 with 95% confidence level and 80% study power. We increased the sample to reach 1000. We explained the objective of the questionnaires before its distribution. Caregivers were also assured of their anonymity and the confidentiality of their responses. Systematic random sample method was used where every 10th was included in the study in order to study the problem of refusal and delay of vaccination.

2.1 Study Site

The study was carried out on caregivers attending immunization setting in 5 urban and rural health facilities in Mansoura district in Egypt.

2.2 Study Tools

The attendants asked to fill the pre-constructed questionnaire after obtaining oral consent from the director of the primary health center and the caregivers. This questionnaire captured the different factors related to immunization delay or refusal such as:

Personal history of the caregiver which included: name, residence, marital status and child order.

Socioeconomic status according to modified socio economic scale by Fahmy and El-Sherbini, 1983 which included Father education, Father occupation, Mother education, Mother occupation, Percapita monthly income in "Egyptian pounds", and the person that is responsible about taking decision in immunization.

Knowledge of caregivers about vaccination such as importance of vaccines to children's health, side effects can a child get after getting a vaccination and the severity of the illnesses of diseases prevented by vaccines.

Caregivers' Attitudes and Belief: On a scale of 0 to 5 with "0" being "strongly disagree" and "5" being "strongly agree," how much do caregivers disagree or agree with the statements such as if vaccines are necessary to protect the health of children, children receive too many vaccines, if vaccines are safe and if they have a good relationship with child's health care provider", these were finally coded into agree and disagree only.

Caregivers' satisfaction about different aspects of care as if they were told about the benefits of childhood vaccinations, told about the possible side-effects of childhood vaccinations, if they feel that they had given enough time to discuss issues that concerned about the vaccinations, wait long time during vaccination session, If health worker tell them about vaccine schedule (time, dose, next visit, If the health worker confirm that thier child swallowed the vaccine, and etc....)

The completed questionnaire were subjected to revision and the collected data were coded, processed and analyzed through SPSS (Statistical Package for Social Sciences) (Standard version release 16.0). A descriptive analysis of the collected data was done in the form of frequencies and percent. Chi Square was used for testing significance of discrete and categorical data. The significance level was considered at $P < 0.05$.

3. RESULTS

Our study group included 1000 children attending the immunization session; the mean age of the children was 9.21 ± 6.06 months. About 53.4% of these children were from urban areas while 46.6% are from rural areas. 69.8% of the children came to their immunization session with their mothers. In more than 80% of the children, the mother is the main caregiver (81.8%) and the father is the responsible financially (87.7%). Both father and mother's educational level attained was tertiary education in about half of the study group (47.1%, 47.0% respectively), 63.6% of our group had enough income with only 5.2% of the fathers and 48.3% of the mother not working.

In this study, we found that no one refused to immunize his children and the frequency of delayed vaccination was 10% only in which more half of them reported that the delay was for DPT (60%) and the least percent was for MMR (9%) Fig. 1. This delay was mainly due to insufficient information about the importance of vaccination (56%), child illness (52.5%), negative knowledge about the vaccines (32%) and also about one quarter due to vaccine deficiency in the health offices Fig. 2.

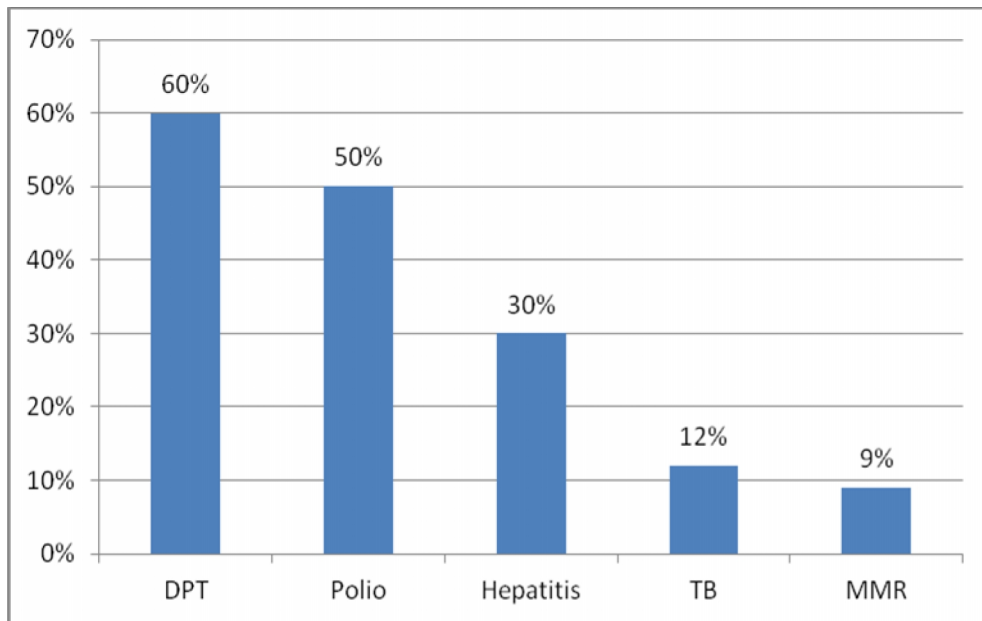


Fig. 1. The percent distribution of different delayed vaccines

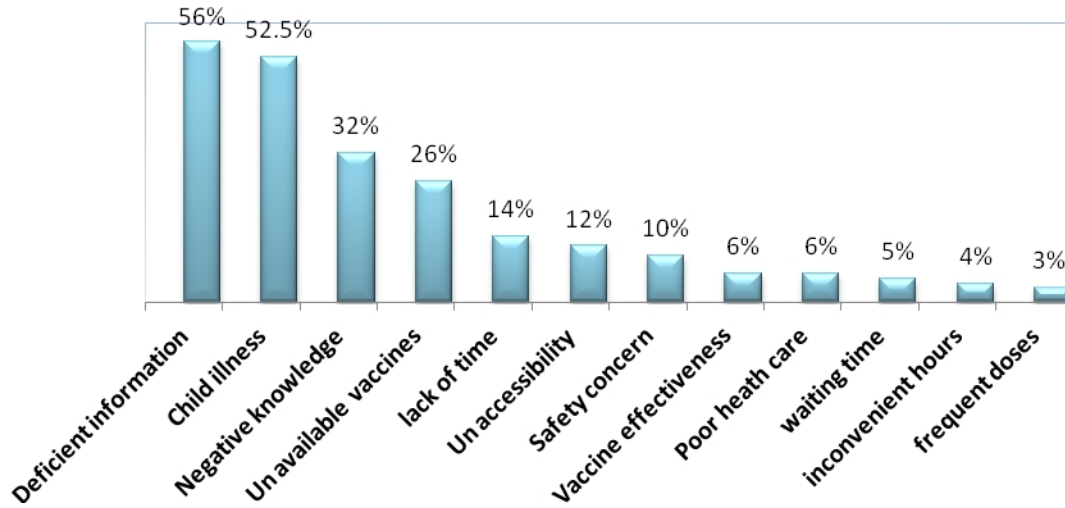


Fig. 2. The percent distribution of different causes of vaccine delay

Regarding the relationship between vaccine related knowledge and caregivers' attitude towards vaccination, it was found that significant higher knowledge detected between caregivers who regularly vaccinated their children compared with caregivers who delayed vaccine regarding the great importance of the vaccines (87% vs. 79%, $p < 0.001$) and the ability to contract the disease if the child is not vaccinated (83.3% vs. 72%, $p < 0.001$) respectively. Also the same detected for the knowledge about the severity of vaccine preventable diseases (76.7% vs 71% respectively) but with no significant difference (Table 1).

Table 1. Distribution of studied groups according to their vaccine related knowledge

Vaccines related knowledge		Vaccination status				Test of significance P value
		FULL N=900		Delayed N=100		
		N	%	N	%	
Importance of Vaccination to child health	very imp	783	87.0%	79	79.0	0.000
	Imp	111	12.3	12	12.0	
	not at all	3	0.3	2	2.0	
	do not know	3	0.3	7	7.0	
Hazards of non vaccination	Do not know	119	13.2	16	16.0	0.0001
	No Hazards	31	3.4	12	12.0	
	Catch Disease	750	83.3	72	72.0	
Severity of vaccine preventable diseases	severe	691	76.7	71	71.0	0.096
	moderate	114	12.7	16	16.0	
	mild	57	6.4	4	4.0	
	Do not know	38	4.2	9	9.0	

The association between caregivers' delay and caregivers' beliefs and attitudes about vaccines, showed that caregivers who delayed vaccines were significantly less likely to believe that vaccines are necessary to protect the health of children compared with caregivers who regularly vaccinated their children, (91% vs. 99.3%, $p<0.001$); that their child might get a disease if they aren't vaccinated (72% vs.83.3%, $p<0.001$) and also they were less likely to read and watch stories about health (93% vs.100%, $p<0.001$)

With respect to influences that discourage caregivers from having their child vaccinated, compared with caregivers who regularly vaccinated their children, caregivers who delayed vaccination were significantly less likely to agree with the statement, "vaccines are safe" (85% vs. 100%, $p<0.001$). Also caregivers who delayed vaccines were significantly less likely to believe that they had a good relationship with their child's health-care provider (85% vs. 100%, $p<0.001$) and that medical professionals in charge of vaccinations have their child's best interest at heart (82% vs. 100%, $p<0.001$). Caregivers who delayed vaccines were significantly more likely to believe that if they vaccinated their child, he/she might have side effects (50% vs. 30%, $p<0.001$) that children receive too many vaccines (100% vs. 92%, $p<0.001$); and that vaccination should be delayed if a child has a minor illness (100% vs. 80%, $p<0.001$) (Table 2).

Table 2. Health belief model of the studied group about vaccination

Caregivers concerns	Asked questions	Vaccination status				Test of significance
		FULL N=900		Delayed N=100		
		N	%	N	%	P value
Child's risk of getting a VPD*	Vaccination is important to protect the health of the child	894	99.3%	91	91.0%	0.000
VPDs are a sufficient health concern to make vaccinations relevant	Interest in health related topics in media.	900	100.0%	93	93.0%	0.000
	Disease development if the child not vaccinated.	750	83.3%	72	72.0%	0.005
Influences that facilitate or discourage parents from having their child vaccinated.	The child receives too many vaccines.	828	92.0%	100	100.0%	0.000
	Vaccination safety	900	100.0%	85	85.0%	0.000
	Good relationship with the child's health care provider	900	100.0%	85	85.0%	0.000
	Medical professional in charge of vaccinations have the child best interest at heart	900	100.0%	82	82.0%	0.000
	Side effect following vaccination.	270	30.0%	50	50.0%	0.000
	Vaccination delay due to minor illness of the child.	720	80.0%	100	100.0%	0.000

*VPD: Vaccine Preventable Disease

Caregivers' satisfaction about perceived knowledge related to vaccines from physician and nurse showed that those who regularly immunized their children reported significant higher satisfaction compared to those who delayed the vaccination regarding vaccine safety (53.1% vs 38%), fever development (62.4% vs 59%), illustration time (30.4% vs 14%) vaccine schedule (72% vs 60%), additional vaccines (71% vs 55%). However the reverse observed regarding insurances of proper vaccine administration where those with delayed vaccination showed significant higher satisfaction than those with regular vaccination (64% vs 51.9% respectively) Table 3.

Table 3. Distribution of studied groups according to caregivers' satisfaction about different aspects of care including perceived knowledge from physician and nurse

Different aspects of care		Vaccination status				Test of significance
		FULL N=900		Delayed N=100		
		N	%	N	%	P value
Knowledge from physician and nurse	Vaccine safety	478	53.1%	38	38.0%	0.000
	Vaccine benefits & importance	378	42.0%	33	33.0%	0.156
	Vaccine side effects					
	• Fever development	562	62.4%	59	59.0%	0.016
	• Fever management	598	66.4%	56	56.0%	0.077
	• others	503	55.9%	53	53.0%	0.489
	Vaccine schedule	648	72%	60	60.0%	0.012
Ensure proper vaccine administration	Additional Vaccination	639	71%	55	55%	0.000
	Illustration Time	274	30.4%	14	14.0%	0.000
	Waiting Time	346	38.4%	32	32.0%	0.358

4. DISCUSSION

Immunization is a proven tool for controlling and eliminating life-threatening infectious diseases and is estimated to avert 2 to 3 million deaths each year. It is one of the most cost-effective health investments, which make it accessible to even the most hard-to-reach and vulnerable populations [1]. Despite this, vaccine preventable diseases remain the most common cause of childhood mortality with an estimated three million deaths each year [10].

Uptake of vaccination services is dependent not only on provision of these services but also on other factors including knowledge and attitude of caregivers [11], density of health workers, accessibility to vaccination clinics and availability of safe needles and syringes. Assessing and evaluation of immunization coverage helps to evaluate progress in achieving program objectives and in improving service delivery [12].

Among the studied children, 900 children (90.0 %) had their full scheduled immunizations by the age of two years. This rate is markedly higher than that reported by Odusanya et al, [13] who aimed to assess vaccination coverage and its determinants in this rural community in Nigeria. In their study, the full immunization coverage in children below 2 years was 61.9

%. Also, our rate is higher than that reported by Jani et al, [14], who aimed at finding out the reasons for non-vaccination and the magnitude of missed opportunities for vaccination in children less than two years of age in a rural area in southern Mozambique. In their study, 71.8 % of the studied children completed their immunization program by the age of 2 years. On the other hand, the vaccination rate reported by the present study is lower than that reported in the United States (94.8%) [15]. This difference may be due to different economic level between different countries that may affect accessibility, availability of vaccines and health care services.

In the present study, caregivers' perception of vaccination importance for child health was significantly associated with full vaccine uptake. This is in accordance with Wilson et al, [16] who concluded that the parental decision to vaccinate was due to recognizing the importance of preventing disease.

We also found that, caregivers who regularly immunized their children had better knowledge than caregivers who delayed child immunization. This is in agreement with Joseph et al, [17] who found that parents' knowledge about the disease and the vaccine is a predictor of higher vaccination compliance. Consistently, De Courval et al. and Davis et al. [18,19] declared that lack of knowledge about the importance of vaccines has been identified as a main barrier to immunization. On the other hand, provision of information about a disease and its adverse sequelae and the effectiveness of the vaccine have been shown to increase uptake, so receiving vaccine-information materials during pregnancy or at a well-child visit before the vaccination visit is very essential.

In our study, the delay vaccination was mainly due to deficient information about the importance of vaccination at time or the timing of vaccination, however there were other causes of delayed vaccination as the fear of side effects of vaccine. Consistently, Ozkaya et al. [20] declared that some mothers refused to complete child vaccination due to high anxiety levels about vaccine side effect. This agreed with Ritvo et al. [21], who revealed that fear of vaccination side-effects may be a barrier for immunization. We also found that delayed vaccination may be due insufficient vaccines in the health offices. In agreement with us, De Serres et al. [22] reported that the unavailability of the vaccines may be a cause of delayed immunization.

In our study the main source of information about vaccination, was obtained from physician and nurse. Consistently, in the study of Rogalska et al. [23] physician, general practitioners, and nurses were found the most important, and the most reliable source regarding vaccination knowledge.

Caregivers' satisfaction about perceived knowledge related to vaccines from physician and nurse showed that those who regularly immunized their children reported significant higher satisfaction compared to those who delayed the vaccination regarding vaccine safety, fever development, illustration time vaccine schedule, and additional vaccines. This matched with Freed et al. [24] who declared that, parents who delayed vaccine were significantly anxious about vaccines safety. They believed that if they vaccinated their child, he/she might have serious side effects.

5. CONCLUSION

In our study, we found that no one refused to immunize his children and the frequency of delayed vaccination was 10%. This delay was mainly due to insufficient information about

the importance of vaccination, child illness, negative knowledge about the vaccines and vaccine deficiency. Our results suggest that modifiable determinants for a negative attitude towards immunization could probably be based on a lack of specific knowledge. Regarding parents satisfaction with health care, we declared that the parents who regularly immunized their children reported significant higher satisfaction compared to those who delayed the vaccination. In fact, there is still uncertainty surrounding the safety of recommended vaccines, so it is recommended to minimize different barriers to vaccinations by improving knowledge of caregivers during the vaccination programs and stepping up awareness campaigns using known and effective communication channels to convey messages to communities. Clearly, the Ministry of health (MOH) needs to do more in informing people about the process of immunization in order to allay fears (e.g., information during the antenatal period may enable caregivers to make more informed decisions about recommended vaccinations) and develop ways of addressing common uncertainties about immunization, including the safety of combining antigens and the need for boosters. Training of the physician about proper communication with caregivers and response to their needs and concerns may increase caregivers' satisfaction.

CONSENT

Oral consents were obtained from participating caregivers after explanation of study objectives with strict confidentiality and the name and identity was optional.

ETHICAL APPROVAL

The study protocol was approved by research ethics committee.

LIMITATION OF THE STUDY

Nevertheless, potential biases should be considered before generalizing these results to all caregivers of Egyptian young children. The most important possible bias is that the caregivers who agreed to participate in the study were those in favor of vaccinations and therefore the most inclined to vaccinate their children with recommended vaccinations.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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