

Influence of Knowledge on Compliance to Childhood Immunization Schedule among Caregivers of Children aged 0-23 Months in Informal Settlements in Nairobi County, Kenya

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Abstract: *Childhood immunization has played a big role in universal child survival; over the years immunization has been used to eradicate infectious communicable illnesses and also in the control of epidemics and outbreaks in many parts of sub-Saharan Africa. With most health initiative researches in Kenya focusing on rural areas, informal settlements have always been overlooked when it comes to health improvement efforts by stakeholders. The study objective was: To establish the influence of level of knowledge on compliance to childhood immunization schedule among caregivers of children 0 – 23 months in informal settlements in Nairobi County, Kenya. The study site was Viwandani and Mukuru kwa Njenga slums in Nairobi County, Kenya. An interviewer-administered questionnaire was administered. The study design was a descriptive cross-sectional research design. Cronbach's Alpha was used for reliability testing; the sample size was 323. Quantitative data was analyzed using SPSS.22 while qualitative data was analyzed thematically. The findings revealed that 91.8% of respondents had taken their children for immunization. Only 67.8% of the respondents knew the age at which vaccination was to start. Only 73.2% of respondents could mention diseases prevented by immunization. Most caregivers 56% got information on immunization from healthcare workers. The test of independence at significance level of 0.01 results showed that level of knowledge ($R^2 = 0.033$, $df = 1$, $p < 0.003$). The study concluded that to improve the caregiver's level of knowledge on immunization; health stakeholders should revamp outreaches and educational campaigns on immunization.*

Keywords: Immunization compliance, Immunization coverage, Infant vaccination card, Vaccine hesitancy.

1. Introduction

Childhood immunization has played a big role in universal child survival. Immunization has been used to eradicate infectious communicable illnesses and also in the control of epidemics and outbreaks in many parts of sub-Saharan Africa. WHO, 2016 estimated that 2 to 3 million people worldwide, die from vaccine-preventable diseases yearly. In Africa, vaccine-preventable diseases such as Tetanus, Diphtheria, Tuberculosis, Pneumonia and Whooping cough, in combination are the leading causes of death in children under 60 months. (WHO, 2016). Vaccination has proven potential in averting millions of deaths and it is a safety net against many diseases if the recommended levels are embraced and followed.

In Kenya, 12 vaccinations are given according to the national childhood immunization schedule to be completed by 9 months. The Ministry of Health Kenya stipulates that a child is considered fully vaccinated when they have received a vaccination regimen of one dose of Measles, Mumps and Rubella, one dose of Tuberculosis (BCG), three doses of Diphtheria, Pertussis, and Tetanus (DPT) and three doses of oral Polio vaccine. As a low middle-income country, Kenya does not have enough resources and manpower to enhance vaccination services against a rapidly increasing population; resulting in persistent coverage gaps in immunization countrywide (Kariuki, 2014).

A large percentage of caregivers in present times have never met someone with Polio or Whooping cough, with vaccine-

preventable illnesses being less common and frequent in today's populations, some caregivers view vaccination as less urgent despite having general knowledge of the importance of immunization (Shelly, 2014).

At the correct time immunization increases protection of children from vaccine preventable illnesses and decreases the outbreak of diseases (Patience, 2018). This study seeks to determine how caregiver's level of knowledge influences compliance with childhood immunization schedule among caregivers of children 0 – 23 months in informal settlements in Nairobi County, Kenya.

2. Literature Review

Smith, (2006) found that children from poor backgrounds and where the caregivers level of education is low were less likely to be vaccinated as the caregivers lacked finances to immunize children and also the caregivers failed to understand the importance of childhood immunization. A similar trend was seen in Nepal, where immunization dropout rates in children decreased with increase in maternal level of education (Basel, 2012). Funimilayo (2013) noted that caregivers' level of education has a positive influence on a child being fully immunized. Funimilayo further found that children born from parents with higher education and knowledge are more likely to comply with childhood immunization schedule as opposed to parents with no education. A clear indication that immunization uptake increases as the parent's knowledge and education increases. Abidoeye, and Odeyemi, (2013) in their research on

knowledge, attitude, and practice of mothers to childhood immunization in Lagos State, Nigeria found that over 73% of their respondents knew about different kinds of immunization. The high knowledge level in the study was attributed to immunization vaccines being named by the diseases they prevent and also to some extent the educational status of the respondent. From the study, only 42% of the respondents knew about Hepatitis B (HBV) vaccination. However, only 6.5% of respondents had knowledge about meningococcal immunization. This could be because of non-integration of meningococcal vaccine into the national immunization programme in many developing countries. Only 36% of respondents responded correctly to what Diphtheria, Pertussis, and Tetanus (DPT) vaccines protect against. Although 89.5% of the respondents knew of Bacille Calmette Guerin (BCG) vaccination, only 25% of them clearly knew what it vaccinated against. Less than 9% of the mothers were able to tell what meningococcal vaccine protects against.

Jisy, Melba, Nisha, Shilpa, and Umarani, (2013) carried out a study on immunization awareness among mothers of children less than five years in Mangalore, India. The study sample was 30 mothers; the study data was collected using a structured knowledge questionnaire, they found that 3.3% of caregivers had excellent knowledge on immunization whereas 30% of mothers had poor knowledge. Overall the study found that religion ($\chi^2=0.09$), occupational status ($\chi^2=0.32$), compliance ($\chi^2=10.1$) and age of mother ($\chi^2=1.28$), had no significant association with knowledge score.

3. Methodology

The study population was caregivers of children aged 0-23 months in Viwandani and Mukuru kwa Njenga slums in Nairobi County, Kenya. The study was conducted under the authority of National Commission for Science, Technology and Innovation Kenya (NACOSTI) and The Ministry of Health Kenya.

A total of 323 caregivers were sampled, the study used short closed-ended questions on the Likert scale range of 1 to 5. Where 5 = strongly agree, 4 = agree, 3 = not sure, 2 = disagree and 1 = strongly disagree.

Quantitative data collected, was coded and entered into SPSS version 22.0 for data analysis. Correlation and multiple regressions were applied to test for association of caregiver's access to health facilities. The regression analysis for primary data was run using SPSS software version 22.0.

4. Analysis

4.1 Descriptive Results for Caregiver Level of Knowledge

According to the descriptive results for caregiver level of knowledge, on the question that immunization should be given according to the current immunization schedule 77.2% of caregivers strongly agreed that the current vaccination schedule should be maintained. A further 81.4% of

caregivers strongly agreed that they would recommend others to vaccinate their children. On whether vaccines are safe for children 70.7% of the respondents strongly agreed that vaccines are safe for children. The results are summarized in Table 1

Table 1: Some Responses on Caregiver Level of Knowledge

Caregiver Level of knowledge						
1 Strongly disagree SD, 2 Disagree D, 3 Not sure, 4 Agree A, 5 Strongly agree SA						
		1	2	3	4	5
1	Vaccination should be given according to schedule	-	1.1% (3)	1.1% (3)	20.5% (54)	77.2% (203)
2	Is it important for children to get recommended vaccines	-	0.4% (1)	1.5% (4)	24% (63)	74.1% (195)
3	Vaccines are safe for children	0.4% (1)		3.8% (10)	24.7% (65)	70.7% (186)
4	Would you recommend others to vaccinate their children	-	1.9% (5)	0.8% (2)	16.0% (42)	81.4% (214)
5	A child with HIV should be vaccinated	2.3% (6)	1.5% (4)	25.5% (67)	10.6% (28)	60.1% (158)
6	Measles, Mumps, Rubella vaccine is administered to children at 15-18 months	1.1% (3)	6.1% (16)	9.9% (26)	21.3% (56)	61.6% (162)
7	Measles can be prevented by immunization	-	8.7% (23)	0.8% (2)	17.5% (46)	73.0% (192)

4.2 Test for Normality on Caregivers Level of Knowledge

The figure 1 illustrates a normal Q-Q plot of caregiver knowledge; the departure from normality was not much as from the approximation to the line of fit. The data was near normal distribution and hence could be used in regression analysis.

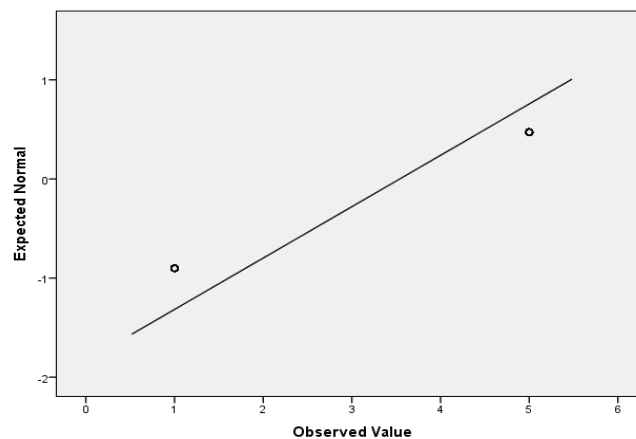


Figure 1: Normal Q-Q plot of knowledge of caregivers

4.3 Correlation of Caregivers Level of Knowledge

Under correlation of the caregiver's level of knowledge and immunization table 2 shows that compliance is $F = 0.181$, this concludes that the strength of the relationship is positive with the p value as 0.003 this shows that it is significant at 0.01 levels. This indicates that increase in caregiver's level of knowledge increases compliance level.

Table 2: Correlation for Caregivers Level of Knowledge

		Knowledge	Compliance
Knowledge	Pearson Correlation	1	
	Sig. (2-tailed)		
Compliance	N	263	
	Pearson Correlation	.181**	1
	Sig. (2-tailed)	.003	
	N	263	263

** . Correlation is significant at the 0.01 level (2-tailed).

4.4 Regression Results for Caregivers Level of Knowledge

From the model summary table 3, R squared was 0.033, this shows that caregiver’s level of knowledge accounts for 3.3% of variance in compliance. From the ANOVA table the relationship is significant, this is shown by F value is 8.829 and P value 0.003 showing that the model is significant at 0.01 level. From the coefficient table, caregiver’s level of knowledge is significant; the regression equation becomes

$$Y \text{ compliance} = 4.685 + 0.043 \text{ Level of Knowledge}$$

From the equation when caregiver’s level of knowledge is zero, compliance is 4.685, an increase in knowledge by 0.043 % increases compliance by 1%. Caregiver’s level of knowledge was positive and significant to compliance to childhood immunization at 0.01 level. From the table 3 the Durbin-Watson value was 1.606 which is between 1.5 and 2.5 thus no autocorrelation problem.

Table 3: Regression results for Caregivers Level of Knowledge

Model Summary ^b						
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	
1	.181 ^a	.033	.29	.44964	1.606	

a. Predictors: (Constant), Knowledge
b. Dependent Variable: Compliance

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.785	1	1.785	8.829	.003 ^b
	Residual	52.768	261	.202		
	Total	54.553	262			

a. Dependent Variable: Compliance
b. Predictors: (Constant), Knowledge Of Caregiver

Coefficients ^a						
Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.	
		B	Std. Error	Beta		
1	(Constant)	4.685	.058		80.744	.000
	Knowledge	.043	.014	.181	2.971	.003

a. Dependent Variable: Compliance

5. Discussion

The study revealed that caregivers had average knowledge on immunization and immunization schedule; this is because about half of the caregivers could not answer the questions on knowledge on immunization. According to the WHO document from which the questions were adopted. Caregivers who were able to answer 60% of questions in this study were considered to have good knowledge in immunization.

The low levels of knowledge on compliance to immunization schedule could be because low level of education and early marriages in the study population. The study revealed that caregivers could only identify vaccines based on the diseases they prevent, this is agreement with a study by Abidoeye, and Odeyemi, (2013) and Jisy, Melba, Nisha, Shilpa, and Umarani, (2013) on immunization compliance in Nigeria and Bangladesh which established that caregivers were only able to name diseases prevented diseases they vaccinate against. The value of R squared under knowledge was 0.033, this shows that caregiver’s level of knowledge accounts for 3.3% of variance in compliance. 96.7% of variance is accounted for by other factors, the Durbin-Watson value was 1.606 which is between 1.5 and 2.5 thus no autocorrelation problem.

The correlation for the level of knowledge and compliance is F = 0.181, this shows that the strength of the relationship was positive p value 0.003 this shows that it is significant at 0.01 level. This indicates that increase in caregiver’s level of knowledge increases compliance, this findings are similar to Funimilayo, (2013) whose research in Nigeria revealed that caregivers’ level of education had a positive influence on a child being fully immunized. From the multiple regression an increase of level of knowledge by 0.043% results in a 1% increase in compliance.

This is also similar to significant findings in the literature that show education as the strongest predictors of childhood immunization (Mouhamed, 2017). An increase in maternal education increases the likelihood of childhood immunization. This could be attributable to the fact that educated women have resources and a higher probability of accessing information on healthcare services. Educated women are more likely to use modern health services, and adopt healthy practices. Educated caregivers are more empowered to exercise authority over their own lives and those of their children.

The findings from this study findings contradicts research by Jisy, Melba, Nisha, Shilpa, and Umarani, (2013) who carried out a study on immunization awareness among mothers of children less than five years in Mangalore, India. The study sample was 30 mothers; the results of the study showed that 30% of mothers had poor knowledge, 43.4% of mothers had the average knowledge, 23.4% mothers had good knowledge, and 3.3% of mothers had excellent knowledge. Overall the study found that there is no significant association between knowledge score and compliance.

6. Conclusion

The study rejects the null hypothesis which says; Caregiver’s knowledge has no influence on compliance to childhood immunization schedule, since it was found that caregiver’s level of knowledge had an influence on compliance to childhood immunization schedule. The study adopts the alternative hypothesis which is; Caregiver’s knowledge has an influence on compliance to childhood immunization schedule.

To improve the caregivers level of knowledge on immunization; health stakeholders should revamp educational campaigns on immunization. Health stakeholders should concentrate on hiring more Community Health workers to educate the community and improve knowledge of caregivers on immunization. This is so because the study found that health workers were the greatest source of information on childhood immunization.

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Author Profile



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