PERSUASIVE COMMUNICATION: THE ROLE OF CAREGIVER CHARACTERISTICS ON ADOPTION OF ROUTINE IMMUNIZATION SERVICES OF CHILDREN AGED 0-5 YEARS IN BOMET COUNTY

Mary Amatu, Professor Hellen Mberia and

Dr. Kyalo Wa Ngula

IPRJB

INTERNATIONAL PEER REVIEWED JOURNALS AND BOOK PUBLISHING

PERSUASIVE COMMUNICATION: THE ROLE OF CAREGIVER CHARACTERISTICS ON ADOPTION OF ROUTINE IMMUNIZATION SERVICES OF CHILDREN AGED 0-5 YEARS IN BOMET COUNTY

[1*]Mary Amatu

PhD Candidate: School of Communication & Development Studies

Jomo Kenyatta University of Agriculture & Technology - Kenya

*Corresponding Author's E-mail: amatumary@gmail.com

[2]Professor Hellen Mberia

Dean, School of Communication & Development Studies

Jomo Kenyatta University of Agriculture & Technology - Kenya

Co-Author's E-mail: hellenmberia@gmail.com

[3]Dr. Kyalo Wa Ngula

Senior Lecturer, School of Humanities and social sciences Chuka University - Kenya

Co-Author's E-mail: kyalowangula@gmail,com

Abstract

Purpose: An estimated two to three million annual deaths from Vaccine preventable diseases (VPDs) are preventable through immunization. Currently about 19.5 million infants miss out on routine immunization globally. The study examined the role of caregiver characteristics in persuasive communication on adoption of routine immunization of children aged 0-5 years in Bomet County – Kenya.

Methodology: This study self-funded, was a cross-sectional hospital based study, employing a mixed method research design. A sample of 384 caregivers participated in the study.Cronbach's alpha and confirmatory factor analysis tests was conducted to ascertain the reliability and validity of study instruments. Chi-square test was done to establish the relationship between caregiver characteristics and adoption of routine immunization. Data was collected using interviewer administered questionnaires and KII guide.

Findings: The response rate was 95.1% with majority of the respondents in the age bracket of 19-25 at 42.2% and 61.4% were married with 36.9 % of the respondents reporting to be housewives. Majority of the respondent had primary level of education at 53.7 %, followed by secondary level those had attained only primary level of education with only 8.8% having attained tertiary level of education and those who had no level of education were 1.9%. On caregiver knowledge, 93.4% did not know any vaccines given to children. However, out of those that had knowledge on the vaccines, 66.3% agreed vaccines have side effects, though majorly they were mythical. Caregiver attitude on routine immunization was found to be negative.

Unique contribution to theory, practice, and policy: The optimal model indicated that for every unit of Caregiver characteristic, the value of adoption changed by 0.386. The study concluded that caregiver characteristics had positive influence on adoption of routine

immunization. The study recommended that routine immunization messages be made frequently available, targeted and tailored to the caregivers. Secondly, the community should be involved in advocacy towards adoption of routine immunization, to create ownership and adoption sustainability. Additionally, health workers should be motivated towards good practices in Healthworker-client communication specifically, persuasive communication to build trust from the caregivers.

Contribution to practice and policy: Adoption of the study findings by the policy makers, will contribute to achieving the recommended 90%, fully immunized coverage. This in turn will reduce vaccine preventable diseases both in the study area and can be generalizing to settings with similar challenges in adoption of routine immunization.

Key words: *persuasive communication, immunization, caregiver*

INTRODUCTION

A fully immunized child is an ambitious but practical indicator that should be used to measure health progress. An estimated two to three million annual deaths from Vaccine preventable diseases (VPDs) are preventable through immunization. Approximately 19.5 million infants, currently miss out on basic immunization (WHO, 2017). According to UNICEF statistics, there has been a recognizable reduction of infant deaths caused by vaccine preventable diseases (VPDs) over the recent years. VPDs are life threatening and delay a country's development. During 2019, about 85% of infants worldwide were vaccinated against the recommended 95% (WHO, 2020). In developing countries, the disproportional rate of morbidity and mortality from vaccine preventable diseases (VPDs) among children under 5 years of age continues to generate discussions on the need for concerted efforts and innovative strategies to address factors militating against the achievement of universal access to immunization by year 2020 (WHO, 2018).

Government of Kenya puts key focus on life threatening vaccine preventable diseases as other peer countries do. According to (KDHS, 2014), infant mortality rate was 39 deaths per 1000 live birth, some of these deaths, having been brought about by vaccine preventable diseases. The report also indicates that only 68% of children in Kenya were fully vaccinated. Communication is one of the basic tenets in health intervention programs. However, noise and distractions, competing messages, filters and channel breakdowns come in as communication barriers in any communication environment (Mutua et al, 2016). A major strategy to reduce vaccine preventable disease is by coming up with and reviewing communication plans with well-defined strategies that will ensure fully immunized child (FIC) in all settlement (UNICEF, 2016).

Statement of the problem

A fully immunized child is an ambitious but practical indicator that should be used to measure health progress. According to UNICEF statistics, there has been a recognizable reduction of infant deaths caused by vaccine preventable diseases (VPDs) over the recent years. VPDs are life threatening and delay a country's development. A major strategy to reduce vaccine preventable disease is by coming up with and reviewing communication plans with well-defined strategies that will ensure fully immunized child (FIC) in all settlements (UNICEF, 2016). In 2017, Kenya's national immunization coverage was 65% for fully immunized child. The top performing counties at coverage above 80% were Kiambu, Turkana and Nairobi. Three counties (6%) had coverage of approximately 50%. The worst performing counties were Trans

Nzoia, Mandera (53%) and Tana River (55%) and Bomet 50%) (WHO, 2017). Bomet was purposely selected for the study for this reason of being the lowest performing.

Bomet County fully immunized children were at 50%, against the national target of 90% and above. This low coverage was being witnessed inspite of the fact that the government of Kenya has put key focus on these life-threatening VPDs as other peer countries do. The report further stated that the reasons for this coverage was not attributed to vaccine or commodity stock outs as there had been none reported in the County and attributed the low adoption to knowledge gap and low literacy levels among the care givers that hinders effective communication. This puts the County at a very high risk of children suffering from the VPDs, which are also communicable (MOH HIS, 2017).

There have been studies conducted in this field:- Harvey et al, (2016) conducted a study on parental reminder, recall interventions to improve childhood immunization adoption: A systematic review and meta-analysis. Oku et al, (2017), studied factors affecting the implementation of childhood vaccination communication and educational strategies in Nigeria and found that message, channel, sender and receiver characteristics influenced adoption of routine immunization. In another study by Heather (2017), on parents' and informal caregivers' views and experiences of communication about routine childhood vaccination, the findings too support these communication characteristics as a factor in adoption. These studies among others supported the role of the caregiver on adoption of vaccination or lack thereof. However, none has been conducted in the study are to verify of disapprove the findings.

The study target population was caregivers seeking services for children aged 0-5years from the five sub-county hospitals. The number estimated to be 1,747 per month (Bomet County health records, 2018). The study was primed on two theories: Elaborate likelihood mode of persuasion (ELM) and diffusion of innovation theory. The study used convergent parallel mixed method design to examining the influence of content message, channel, sender and receiver characteristics on the adoption of routine immunization as independent variables.

This study therefore sought to determine persuasive communication factors, relating to caregiver characteristics influencing adoption of routine immunization of children aged 0-5 years in Bomet County. The study adopted null hypothesis as stated below.

> $H_{01:}$*There is no significant influence of caregiver characteristics on adoption of routine immunization of children aged 0-5 years in Bomet County*

MATERIALS AND METHODS

This was a cross sectional study. The study was carried out in Bomet County. Bomet County, the primary sampling unit, was purposively selected being the poorly performing (at 50% fully immunized children coverage) in adoption of vaccination service of children aged 0-5 years The target population was caregivers (15-49years) seeking care for children aged 0-5years to seek services at the sub-county hospital, estimated to be 1747 (Bomet County health records, 2018). The sampling frame was the day's outpatient/pediatrics clinic register in the five sub-counties hospitals. Sample size was determined according to Fischer et al. (1991). Using the following formula;

$$n= \frac{Z^2pq}{d^2}$$

Where:

Z = The standard deviate (1.96)

n = Desired sample size

p = Percentage of population with the desired characteristics

q = 1-p

d = Margin of error (0.05)

$$\text{Therefore: } n = \frac{(1.96)^2 (0.50) (0.50)}{(0.05)^2} = 384$$

The 384 study participants were allocated to the five Sub-counties proportionately, depending with the average number of children 0-5 years attended to in the Sub-county hospitals monthly, (table 1).

Table 1: Proportionate Sampling of Study Sample

Sub-County	Number seen	%	Participants	Sampling interval
Sotik	400	23	88	5
Bomet East	296	17	65	5
Bomet central	332	19	73	5
Konoin	332	19	73	5
Chepalungu	387	22	85	5
TOTAL	**1,747**	**100**	**384**	

A semi-structured interviewer administered questionnaire was used on caregivers seeking services for children age 0-5years at the Sub-County health facilities. In addition, the researcher conducted KII interviews with health workers. Validity was ensured by use of random heterogeneous samples whose findings can be generalized. Further, Cronbach's Alpha test was used for measuring reliability in this study.

Data analysis and presentation

In order to conduct the data analysis SPSS tool was used. The qualitative data was trascribed according to the identified themes and edited then analyzed qualitatively in the form of narratives.

RESULTS

Data was collected from all the five Sub-counties of Bomet County. During data cleaning, only 365 questioners out of the 384 participants interviewed, had questioners properly completed and therefore qualified for data analysis. This translated to 95.1% response rate (table 2). Based

on these findings, the response rate was adequate per the general rule of thumb of good response rate of 50% and above.

Table 2: Response Rate

Response Rate	Frequency	Percent
Completed	384	100%
Fit for analysis	365	95.1%
Spoilt	19	4.9%
Total	**384**	**100%**

Socio demographic characteristics

To investigate age distribution of respondents, it was found out that, majority were in the age bracket of 19-25 at 42.2%. This was closely followed by age 26-30 at 21.9%. Age 14-18 indicated a percentage of 13.3%. Age 31-35 recorded a percentage of 11.0%, 36-40 then 41& above recorded 5.8% for each case. On the question of marital status, it was established that majority of the respondent are married and this was supported by 61.4%. This is in spite of the fact that a significant percentage of them being in the age bracket of 14- 18 year (teenagers), forming 36.6 % of the population of single mothers.

The question on the number of children, 49.3% had between 4-6, followed by 35.0% having between 1-3 and 15.6% had above 6 children. 75.3% had one child below 5 years with a significant percentage (20%), having two children below 5 years. The study was also interested in establishing the level of education and occupation of the respondents. The finding were that majority of the respondent had primary level of education at 53.7 %, followed by secondary level those had attained only primary level of education with only 8.8% having attained tertiary level of education and lastly those who had no level of education were 1.9% which was the least (table 4).

Further, it was found that 36.9 % of the respondents reported to be housewives, 29.9 were farmers, with the 14.1 % being self-employed and 10.1% were in formal employment (table 4). It was obvious that there was high levels of dependency which may affect adoption of routine immunization. Concerning 57.3 % were Protestants, a significant number (37.3%) catholic, Muslims 5.5% and others taking up the remaining 6.8% (table 4).

Table 4: Demographic Information

Age in years	Frequency	Percent	Cumulative Percent
14-18	49	13.4	13.4
19-25	154	42.2	55.6
26-30	80	21.9	77.5

31-35	40	11.0	88.5
36-40	21	5.8	94.2
41& above	21	5.8	**100**
Total	**365**	**100**	

Marital status			
Single	141	38.6	38.6
Married	224	61.4	**100.0**
Total	**365**	**100.0**	

Occupation			
Housewife	135	36.9	36.9
Farmer	109	29.9	66.8
Self-employed	51	14.1	80.9
Employed	70	19.1	**100**
Total	**365**	**100**	

Level of education			
Never been to school	7	1.9	1.9
Primary education	196	53.7	55.6
Secondary education	130	35.6	91.2
Tertiary education	32	8.8	**100**
Total	**365**	**100**	

Religion of respondents			
Catholic	136	37.3	37.3
Protestant	184	50.4	87.7
Muslim	20	5.5	93.2
Others	25	6.8	**100**

Total	**365**	**100**	
Number of children			
1-3	128	35.1	35.1
4-6	180	49.3	84.4
Above 6	57	15.6	**100**
Total	**365**	**100**	

Care giver charcteristics influencing adoption of routine immunization of children age 0-5 years in Bomet County

Knowledge on vaccines

The participants were asked if they knew any vaccines given to children. 93.4 % said they did. The 93.4% participants were then asked to indicate the vaccines they knew, indicating the diseases they prevent and the recommended MOH schedule (table 5). The results were: Knowledge of BCG; 73.9% knew about BCG, 51.3% knew it prevents TB with a 48.7% who did not know. About knowledge of the Polio Vaccine; 84.2% knew polio vaccine, 66.0% knew it prevents Poliomyelitis and only 19.1% knew when it is supposed to be given. Knowledge of the Diphtheria vaccine; Only 3.8% knew about Diphtheria with majority (96.2%), not aware. 95.9% did not know what disease it prevents and only 3.6% were aware of when it is given. Knowledge of the Pneumococcal vaccine; 39.3% were aware of the vaccine, on the disease it prevents, 68.3% knew it prevents pneumonia, and only 5.7% knew when it is supposed to be given. Knowledge of the Rota Virus; 81.2% did not know the vaccine, 86.2% did not know the disease the child is protected from and 95.6% did not know when is given. Knowledge of the Measles vaccine; 54.3% knew about the vaccine with 45.7% not aware. Only 30.2% knew what disease it prevents, with 69.8% not aware. Knew about measles, 92.6% did not know when it is supposed to be given.

Knowledge on vaccines side effect

The participants were asked if vaccines have any side effects; 66.3% agreed and 33.7% said no (table 5). The 66.3% were further asked to mention the side effect that can possibly occur.

The following were the responses; 87.1% cause fever, 82.1% make children sick, 78.1% make children infertile, 72.7 % can cause polio, 63.6% said it can give children HIV/AIDs (table 4.6).

Table 5: Knowledge on Vaccines

	Frequency	Percent	Valid Percent
Yes	242	66.3	66.3
No	123	33.7	33.7

			Side effects		Total
			Yes	No	
Can give children a fever	Yes	Count	209	0	209
		% within Side effects	87.1%	0.0%	84.6%
		% within Side effects	12.9%	100.0%	15.4%
Can make children sick	Yes	Count	197	0	197
		% within Side effects	82.1%	0.0%	79.8%
	No	Count	43	7	50
		% within Side effects	17.9%	100.0%	20.2%
Total		Count	240	7	247
Can make children infertile	Yes	Count	189	0	189
		% within Side effects	78.1%	0.0%	75.9%
	No	Count	53	7	60
		% within Side effects	21.9%	100.0%	24.1%
Total		Count	242	7	249
Can cause polio	Yes	Count	176	0	176
		% within Side effects	72.7%	0.0%	70.7%
	No	Count	66	7	73

The row above the table (continuation from previous page):

Total	365	100.0	100.0	

Table 6: Vaccines Side Effects

			27.3%	100.0%	29.3%
	Total	Count	242	7	249
		Count	154	0	154
Can give HIV/AIDs	Yes	% within Side effects	63.6%	0.0%	61.8%
		Count	88	7	95
	No	% within Side effects	36.4%	100.0%	38.2%
Total		Count	242	7	249

Knowledge on death from VPD

On the question of whether they had heard about a death of a child associated with VPDs, 59.5% said they had heard of a child who died of a vaccine preventable disease (table 7). Out of these, 60.8% felt these deaths could have been prevented by vaccination.

Table 7: Knowledge on Death from VPD

	Frequency	**Percent**	**Valid Percent**
Yes	217	59.5.	59.5
No	148	40.5	40.5
Total	365	100.0	100.0

Caregiver attitude

To measure the Caregiver attitude, the participant was asked to respond on the statement, 'Vaccination is safe for my child'. 36.4% were undecided, a significant percentage (23.6%) agreed that it is safe, 20.3% strongly agreed with only 17% disagreeing. This gave a mean of 3.43. If they felt it was not safe, they would not have been at the clinic. When asked if it is necessary for them to take their child for vaccination, 37.7% agreed, 19.8% were undecided, with 23.1% disagreed and then 3.3% strongly disagreed. The response on; 'I would consider buying vaccines if they are no longer available for free', was as follows; 55.6% strongly disagreed, 22.7% disagreed, 17.0% were undecided with only 0.3% agreed and 4.4% strongly agreeing, giving a mean of 1.74 (table 8).

Table 8: Care Giver Attitude

INDICATORS	**SD**	**D**	**U**	**A**	**SA**	**MEAN**	**STD. DEV**

Vaccination is safe for my child	2.7%	17.0%	36.4%	23.6%	20.3%	3.43	1.072
It is necessary for me to take my child for vaccination	3.3%	23.1%	19.8%	37.7%	16.0%	3.40	1.106
I would consider buying vaccines if they are no longer available for free	55.6%	22.7%	17.0%	0.3%	4.4%	1.74	1.033

Logistic regression: Care giver characteristics and adoption

In this section, the study objective was to establish the influence of Caregiver characteristics on adoption of routine immunization of children aged 0-5 years in Bomet County. The objective was tested using hypotheses that; there is no significant influence of Care giver characteristics on adoption of routine immunization of children aged 0-5 years in Bomet County. Analysis using Logistic regression was performed based on logistic model, the output between Caregiver characteristics and adoption of routine immunization and the equation table only included a constant so every respondent had the same chance of saying Yes or No for the response on if the child had been immunized.

The intercept-only model recorded ln(odds) =.053 which translates to predicted odds value of [Exp(B)] =1.028. If both sides of the equation was exponentiated. That is, the predicted odds of those who adopted vaccination against those that did not. Since 185 of the respondents said Yes while 180 said No, the observed odds were 185/180 = 1.028 (table 9 and 10).

Table 9: Classification for Care Giver Characteristics

Model 1

	Observed				Predicted		
					Adoption of routine immunization		Percentage Correct
					No	Yes	
Step 1	Adoption of routine immunization			No	0	180	0.00
				Yes	0	185	100.0
	Overall Percentage						51.3

Table 10: Variables in the Equation for Care Giver Characteristics

	B	**S.E.**	**Wald**	**Df**	**Sig.**	**Exp(B)**

Step 0	Constant	.053	.133	.159	1	.690	1.028

On inclusion of the independent variable Care giver characteristics in the model, Block 1 that consist of Omnibus test table, model summary, classification, a new variable equation table was obtained. The omnibus Tests of Model Coefficients for Care giver characteristics table displayed the outcome of the Likelihood Ratio (LR) test, shows whether the inclusion of the variables in the block of variables contributes significantly to model fit. P-value was employed in making decision (table 11).

Table11: Omnibus Tests of Model Coefficients for Care Giver Characteristics

		Chi-square	Df	Sig.
	Step	82.514	1	.000
Step 1	Block	82.514	1	.000
	Model	82.514	1	.000

The objective was realized by inclusion of Caregiver characteristics in the model and this led to two situations as stated. The omnibus test models for the model showed significant values of p-values of 0.000. The findings concluded that Caregiver characteristics had a significance influence on adoption of routine immunization of children aged 0-5 years in Bomet County.

The study findings as displayed in summary model table are evidence that inclusion of Care giver characteristics in the model contributed significantly towards improvement of model since two pseudo R2 (Cox & Snell R-Square and Nagelkerke R-Square) values of 0.306 to 0.408 for model 1 and 0.436 to 0.586 for model 2 were recorded. The two pseudo R2 indicates that 30.6% to 40.8% and 43.6% to 58.6% of the variation in adoption of routine immunization, was explained by Care giver characteristics for the model (table 12).

Table 12: Model Summary for Care Giver Characteristics

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	230.629[a]	.306	.408
2	177.532[a]	.436	.582

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Model classification table output of logistic regression when the independent variable Caregiver characteristics was included, gave an improvement on the two models. The classification rate had increased by 23.0% to 74.3% for the model. These outputs were indicators that, there was an improvement of the model.

Equation, after incorporating Care giver characteristics in the block, the relationship between the predictor variable (Caregiver characteristics) and Adoption of routine immunization was expressed as; $Y=10.420+2.569X_1$. The model indicated that for every unit of Caregiver characteristic, the value of adoption changes by 0.386 (table 13 and 14).

Table 13: Model Summary for Care Giver Characteristics

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	230.629[a]	.306	.408
2	177.532[a]	.436	.582

a. Estimation terminated at iteration number 4 because parameter estimates changed by less than .001.

Table 14: Variables in the Equation for Caregiver Characteristics

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 0	Constant	.053	.133	.159	1	.690	1.028

DISCUSSION

Demographic characteristics

A significant number of the participants were teenagers. This study agrees with one carried out by Kachikis et al, (2020), on routine immunization uptake that found maternal age is a factor influencing adoption of routine immunization. Although majority of the respondents were married, this study did not find any significant difference in attitude or adoption of routine immunization between the single and married caregivers. These findings differs with a study that found that female caregivers that were married had good attitude towards adoption of immunization services (Esohe et al, 2016). Further, the study established that those participants with 1-3 children had the highest adoption rate compared to those with a higher number. The higher the number of children and specifically those with more below five years adopted less the routine immunization (P value of 0.004). This study agrees with one that found that those women with higher number of children tended to ignore taking children for vaccination (Hayles et al, 2015) & (Anyene, 2014).

Those participants with higher level of education had higher likelihood of adoption of routine immunization (P value of 0.001). This study is in agreement with a study that found that children of caregivers with lower maternal education were less likely to be fully vaccinated (Lisa et al, 2014) & (Ouko, 2014). Additionally, the study agrees with that of Imoh, (2014), that found that education level determines immunization coverage as the study found that coverage was higher in areas where most caregivers generally had knowledge about vaccine preventable diseases symptoms. The occupation of a caregiver was not found to have an effect on adoption of routine immunization in this county. However, this study contradicts with studies that have documented that caregiver occupation may determine adoption of routine immunization. This analogy does not relate with other studies such as one on routine immunization review in Nigeria, O'Connell & Wonodi, (2015), found that caregivers who were employed were found to adopt routine immunization compared to their counterparts who were housewives.

Religion had an influence on adoption with those that were Catholics having lower adoption compared to the others in other denomination (p value 0.003). They were found to be the same

group that had wrong information on side effects. Studies have found a relation between routine immunization adoption and religion. Conspiracy theories linking vaccination and fertility control and/or sterilization have been propounded and promoted by religious leaders (Kaufman et al, 2017) and (Anyene, 2014).

Care giver charcteristics influencing adoption of routine immunization of children age 0-5 years in Bomet County

Only 33% of the participants had some knowledge on the vaccine type, disease it prevents and schedule of immunization. Even those few that said they knew any vaccine, there was knowledge gap on specific types of vaccines, vaccine schedule and diseases they prevent. The knowledge some had on the vaccines and the benefits, was not accurate. The vaccine most known to the participants was Polio (84.2%) and the researcher attributed this to the vaccination campaign that had happened earlier and not routine vaccination communication. Different scholars have shown that caregivers' knowledge is a factor in adoption of routine immunization. Without heightened awareness and adequate knowledge of the importance of vaccination, the propensity of vaccination diminishes resulting to vaccine hesitancy (UNICEF, 2016).

Vaccine side effects

The caregivers' were found to have a lot of information on the vaccines' side effects. However, much of the information was misinformed and mythical. For example 78.1% indicated that one of the side effects of the vaccine is that they can make children infertile with 63.6% of the respondents indicating that the vaccine can give children HIV& AIDS. This could be a reason for the low adoption of routine immunization services. This study agrees with another that found that a paradoxical situation may emerge where individuals and communities feel less threatened by the less visible vaccine-preventable diseases than by the side effects of vaccines (Attah, 2016).

Knowledge of death following VPD and if this could be prevented through vaccination was tested and actually found to be high. When KII were asked on the challenges that they encounter that led to the low routine immunization adoption, most cited high level of illiteracy, myths and misconception and fear of side effect. One of them said that;

'There was drastic reduction in adoption following a reported death following vaccination that was reported in Konini Sub-county sometimes between 2015 and 2016'.

In this study, this should have been a motivation towards adoption of routine immunization but it was not the case. This contradicts studies that found that caregivers who had limited knowledge on fatalism, following low immunization coverage, believed that a supernatural force controlled their wellbeing and they had limited aspirations for advancement and low levels of achievement motivation (Oku et al, 2017).

Caregiver attitude towards routine immunization

Further, the participants were found to have negative attitude towards vaccination. Improved perceptions of seriousness of some diseases and positive shifts in attitudes regarding childhood vaccination among the caregivers has been reported to improve adoption of routine immunization (Oku et al, 2017) and (Phillips, 2017).

The KII were interviewed and agreed that health education was given every day. There was even evidence of scheduled immunization education sessions. A number reported challenge

that the caregivers are impatient and they tend to come to the clinic late. For example one of the said;

'In this region, people keep dairy cows and calls for women, who are the main caregivers, have to start by taking care of their animals before taking their children to the clinic'.

Studies have reported vaccination hesitancy that was associated with fear of side effects. A study conducted in Kakamega County - Kenya, Chesoli (2015) reported that vaccine hesitancy had been reported in areas where the community had a lot of knowledge, some with falsehoods on the severity and types of vaccine side effects.

Logistic regression: Care giver characteristics and adoption

Model classification table output of logistic regression when the independent variable Caregiver characteristics was included, gave an improvement on the two models. The classification rate had increased by 23.0% to 74.3% for the model. The intercept-only model recorded ln(odds) =.053 which translates to predicted odds value of [Exp(B)] =1.028. If both sides of the equation was exponentiated. That is, the predicted odds of those who adopted vaccination against those that did not. Since 185 of the respondents said Yes while 180 said No, the observed odds were 185/180 = 1.028. The model indicated that for every unit of Caregiver characteristic, the value of adoption changes by 0.386. From these results, it was therefore, concluded that Care giver characteristics had significant positive influence on Adoption of routine immunization of children aged 0-5 years in Bomet County.

Study findings agree with several others. An example is Thomson et al, (2015), who stated that healthcare, should involve communication with the intended recipient and as in the case of childhood vaccination, the caregiver. An important function of communication to parents about vaccination is to provide information about the role of vaccination in their setting, vaccine effectiveness, and potential side effects of every individual vaccine (Kimmel & Wolfe, 2015). Hypothesis analysis was performed using wald-statistics and P-values, The following values were obtained; W-V 5.429 P- value .000. Therefore the **H_0:** There is no significant influence of receiver characteristics on adoption of routine immunization in Bomet County, Kenya, was rejected.

CONCLUSION AND RECOMMENDATIONS

The two pseudo R2 indicates that 30.6% to 40.8% of the variation in adoption of routine immunization, was explained by Caregiver characteristics for the model. Caregiver characteristics were found to have influence on adoption. This variation in adoption was elicited even without introduction of any moderator.

Based on the study findings, the researcher gave the following recommendations;

1. Routine immunization specific messages, targeted and tailored to the caregivers, should be made available and provided frequently. The knowledge gap should be addressed by the sender making sure that messages are simple, clear and in a language that is easily understood by the caregivers
2. To achieve community support, community ownership should be cultivated by involving the opinion leaders such as religious leaders, local administration and community own resource persons. Involvement strategy should include use of the community members in routine immunization advocacy activities
3. The study having found that health workers are the main channels as well as senders of the routine immunization messages, the county health management should find means

of motivating health workers towards achieving good Healthworker-caregiver communication tactic. This will help the caregivers to build trust and identify with the message sender to address the gap identified in the study.

ACKNOWLEDGEMENT

REFERENCES

Attah P. Ombugadu (2016). Determinants of routine immunization coverage among 12-23 months old children of nomadic population in Akwanga local government area, Nasarawa state, Nigeria

Ben C. Anyene (2014). The Role of Politics, Religion and Cultural Practices AJHE-2014-Vol 3 (1). African Journal of Health Economics December 2014.

Bomet County health records (2018). County intergrated development plan 2018-2022

Chesoli, R. N. (2015). Factors influencing implementation of immunization programs in primary healthcare facilities in Kakamega county. Retrieved from http://erepository.uonbi.ac.ke/handle/11295/90581

Esohe Olivia Ogboghodo, Hendrith A. Esene, Obehi H. Okujie (2016)/ Determinants of adoption of Pentavalent in Benine City, Southern Nigeria. International Journal of community medicine and Public Health.

Hayles, E., Cooper, S., Wood, N., Skinner, S., & Sinn, J. (2015). Pertussis booster vaccination in pregnancy: Women who had it compared to those who waited. *Procedia in Vaccinology*, *9*, 59-65. https://doi.org/10.1016/j.provac.2015.05.010

Heather Melanie Ames (2017). Mapping, exploring and understanding communication interventions for childhood vaccination

Imoh, G. (2014). Communication Factors That Influence Mothers Decision To Complete Childhood Immunization In Rural Nigeria. *Global Journal of Arts Humanities and Social Sciences*, *2*(7), 7–17.

Kachikis, A., Eckert, L. O., & Englund, J. A. (2020). The history of maternal immunization. *Maternal Immunization*, 3-24. https://doi.org/10.1016/b978-0-12-814582-1.00001-2

Kaufman, J., Ryan, R., Glenton, C., Lewin, S., Bosch-Capblanch, X., Cartier, Y., … Hill, S. (2017). Childhood vaccination communication outcomes unpacked and organized in a taxonomy to facilitate core outcome establishment. Journal of Clinical Epidemiology, 84, 173–184. http://doi.org/10.1016/j.jclinepi.2017.02.007

Kenya demographic health survey (2014).

Kimmel, S. R., & Wolfe, R. M. (2015). Communicating the benefits and risks of vaccines. Journal of Family Practice, 54(1), S51-58.

Lisa M. Calhoun, Anna M. van Eijk, Kim A. Lindblade, Frank O. Odhiambo, Mark L. Wilson, Elizabeth Winterbauer, Laurence Slutsker and Mary J. Hamel (2014). Determinants and coverage of vaccination in children in western Kenya from a 2003 cross-Sectional Survey. The American Journal of Tropical Medicine and Hygiene. 2014 Feb 5; 90(2):234241.

Martin K. Mutua, Elizabeth K. Murage, Nicholas Ngomi, Henrik Ravn, Peter Mwaniki & Elizabeth E. (2016). Fully immunized child: coverage, timing and sequencing of routine immunization in an urban poor settlement in Nairobi, Kenya

Ministry of Health (2017). Health records Report final - 2016/17 – 2018/19

O'Connell, M., & Wonodi, C. (2015). Routine immunization consultants (RICON) review in Nigeria: A country driven management approach for health systems strengthening in routine immunization. *Annals of Global Health*, *81*(1), 183. https://doi.org/10.1016/j.aogh.2015.02.920Rogozhina, I. (2018). undefined. https://doi.org/10.5194/tc-2018-45-rc2

Oku, A., Oyo-Ita, A., Glenton, C., Fretheim, A., Ames, H., Muloliwa, A., … Lewin, S. (2017). Perceptions and experiences of childhood vaccination communication strategies among caregivers and health workers in Nigeria: A qualitative study. PLoS ONE, 12(11), 1–21. http://doi.org/10.1371/journal.pone.0186733

Ouko Julia Awino (2014). Determinants of immunization coverage among children aged 12-23 months in kenya

Phillips E Vogt (2017). Childhood Vaccines in Uganda and Zambia: Determinants and Barriers to Effective Coverage

Thomson, A., Watson, M., Picot, V., Louis, J., & Saadatian-Elahi, M. (2015). From package to protection: how do we close global coverage gaps to optimize the impact of vaccination? Journal of Vaccines & Immunization, 3(4), 19–24. http://doi.org/10.14312/2053-1273.

UNICEF, (2016). Factors Influencing Vaccine Hesitancy and Immunization Coverage in Zimbabwe: Ministry of Health, ZIMBABWE, 1(2), 13–475. Wang, Z., & Zou, Z. (2018). Quantifying multicollinearity in ship manoeuvring modeling by variance inflation factor. *Volume 7A: Ocean Engineering*. https://doi.org/10.1115/omae2018-77121

WHO (2020). Immunization coverage, World Immunization Week

WHO, (2018). Systematic literature review of the evidence for effective national immunisation schedule promotional communications. Insights into health communication (Vol. 23).

WHO, (2017). Immunization Coverage Fact Sheet. Available online: http://www.who.int/mediacentre/ factsheets/fs378/en/