

Original Research Article

Perceptions of caregivers on immunization in Ntungamo district, Uganda

Byamukama Topher^{1*}, Keraka M. Margaret², Gitonga Eliphas³

¹Department of Community Health, School of Medicine, Kabale University, Uganda

²School of Public Health, Kenyatta University, Nairobi, Kenya

³Department of Population, Reproductive Health and Community resource Management, Kenyatta University, Kenya

Received: 04 October 2021

Accepted: 09 November 2021

*Correspondence:

Byamukama Topher,

E-mail: byamukamat@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Immunization is one of the most cost-effective public health interventions to reduce child mortality and morbidity associated with infectious diseases. The objective of this study was to determine the perceptions of caregivers on immunization in Ntungamo district.

Methods: Quasi-experimental study was used with health centres assigned to intervention and control groups. Purposive sampling was used to select the two counties where the study was done. Proportional sampling was done to get study samples from each health facility, while systematic sampling was done to get study participants. A total of 787 children from twelve health facilities provided the study sample. A post intervention evaluation was conducted to determine the effect of these interventions. Association of variables was tested using Mann Whitney U-test and Chi-square.

Results: On benefits, most caregivers in the intervention group (85.3%) and in the control group (54.3%) regarded immunization as very highly and moderately beneficial to their children respectively. On risks, most caregivers in the intervention group (85.5%) and control group (43.1%) regarded the risk factor associated with immunization as very low and moderate respectively. From hypothesis testing, there was a significant difference on the perceived benefits and risks of immunization between the intervention and control group.

Conclusions: Most caregivers in the intervention and control group regarded immunization as very highly beneficial and moderately to their children respectively. Most of the caregivers in the intervention and control group regarded the risk factor associated with immunization as very low and moderate respectively.

Keywords: Perceptions, Immunization, Intervention, Caregivers

INTRODUCTION

Evidence of effectiveness of community-based interventions in improving immunization coverage in populations of low coverage is limited. Immunization session is meant to be a one-stop shop for caregivers by receiving all the information and services needed for the child. Vaccine preventable diseases is a major public health challenge in low income countries where Uganda lies, and immunization is only reliable strategy for child survival preventing more than 2.5 million deaths among

children.^{1,11} However, despite growing availability of immunization services, research evaluating uptake of immunization services indicates low coverage in many countries, Uganda inclusive.

In African region, immunization coverage has stagnated over the last five years leading to outbreaks of vaccine preventable diseases among the population. Globally, full immunization coverage for children aged 12 to 23 months stands at 83%.⁵ In Uganda, official immunization coverage of polio 3, Diphtheria-tetanus-pertussis (DPT3)

and Pneumococcal conjugate vaccine (PCV3) antigens is far below the required coverage.⁵ The national immunization coverage rate in Uganda, which is measured by percentage of children who received third dose of diphtheria-tetanus-pertussis vaccine (DPT3) stands at 78%.⁴ According to WHO/UNICEF, Uganda is ranked among countries with the highest number of unimmunized children.^{17,20}

Declining immunization rates may be due to concerns of caregivers about immunization, leading to increase in Vaccine preventable diseases. The decision to immunize includes a spectrum from complete refusal to acceptance in confidence and it is influenced by experiences, family, trust, personal, social norms and opportunity.^{9,13} The perceptions of those who are opposed to immunization include concerns with vaccine effectiveness, low likelihood of contracting the disease and the potential for vaccines to be more harm than good. Those in favour of the immunization take it as their responsibility as parents or as a public health duty and being a responsible citizen.^{3,12} The reasons for caregiver not immunizing their children are due to lack of impact of vaccination or negative experiences they had with the immunization. Some caregivers perceive that risks outweigh benefits and consider their children being better off without being immunized.^{3,16}

Ntungamo district is among 90 districts out of 112 districts in Uganda that have poor access and poor utilization of immunization services not reaching over 80% of the children with all recommended doses of childhood vaccinations in accordance with district specific targets. Uganda is found among countries that are ranked as having the highest number of unimmunized children.^{6,18} In Sub-Saharan Africa, about 31 million children less than five years are affected by vaccine preventable diseases every year and more than a half of them die due to lack of vaccines.

METHODS

The study was conducted in Ruhaama south and Kajara counties in Ntungamo district. Ntungamo district is bordered to the north by Mitooma and Sheema districts and Rwampara district, going from west to east, Isingiro district to the east, the Republic of Rwanda to the south, Rukiiga district to the southwest and Rukungiri district to the northwest. The district headquarters of Ntungamo are located about 330 km south west of Kampala the capital city of Uganda and about 66 km (41 miles), by road, southwest of Mbarara, the largest city in Ankole sub-region. The coordinates of the district are: 00 53S, 30 16E and the district covers an area of 2,051.4 sq km (792.0 sq miles) of which around 0.2% is open water, 3.4% is wetland and close to 0.01% is forest. The district has 16 government facilities and 1 private not for profit that do conduct deliveries. The district has a population of 491000 people (2014 census).

The research used Quasi-experimental study which was conducted in three phases. In this study, the principal investigator used mixed methods namely structured interviews and key informant interviews as a data collection tools in assessing the uptake of immunization services by caregivers in Ntungamo. Phase one provided baseline data before intervention, the second phase was community-based intervention and the third phase was post intervention evaluation. Purposive sampling was used to select the two counties where the survey was conducted, while simple random sampling was used to select the county where intervention took place. All health facilities conducting deliveries were considered for the study.

Proportional sampling procedure was used to arrive at the study sample from each facility and systematic random sampling was used to get study participants. The two counties were selected on the basis of having the same social economic and demographic characteristics and both having poor immunization coverage compared to other counties. 787 caregivers were enrolled for the study, 394 in the intervention arm and 393 in the control arm. The original health educational materials were prepared in English by the immunization experts from DHO's office and were translated into the local language (Runyankole) and delivered by health workers with expertise in the area of immunization. In order to get baseline data about immunization, a pre-evaluation survey questionnaire was administered to caregivers in both groups. A community-based intervention was conducted in one of the randomly selected group and the second group acted as a control. The two groups were followed up for nine months after which a post evaluation survey was conducted in both groups to evaluate the impact of the intervention.

Double data entry and validation was done in Epidata then transferred to SPSS version 22 for analysis. Descriptive analysis and inferential analysis were done. Descriptive statistics such as frequencies, percentages, arithmetic means and standard deviations were obtained. Inferential statistics such as hypothesis testing was conducted to determine whether there is a significant difference on the perception of caregivers on immunization between the intervention and the control group. Some of the statistical tests that were used under hypothesis testing include the Mann-Whitney U test and the Chi square test.

RESULTS

On the perception of the caregivers on immunization the study focused on the perceived benefits of immunization and the perceived risks of immunization. On the perceived benefits of immunization, caregivers were asked whether they thought immunization makes children grow well. 11.7% and 95.4% of the caregivers in the intervention group and 6.8% and 27.6% of the caregivers in the control believed that immunization significantly

contributes to the well growth of their children before and after the intervention respectively.

Equally, arithmetic mean of 4.79 and 3.08 for the intervention and control groups respectively showed that the caregivers on the intervention group generally strongly believed that immunization makes children grow well while the caregivers in the control group were generally not sure whether immunization makes children grow well (Table 1).

The caregivers were asked whether they thought an immunized child rarely gets infected with diseases.

The caregivers beliefs that an immunized child rarely gets infected with diseases in the intervention group increased from 9.1% before intervention to 94.2% after intervention and from 11.2% to 26.7% in the control group respectively. On the same note, arithmetic mean of 4.78 and 3.03 for the intervention and control groups respectively showed that the caregivers on the intervention group generally strongly believed that an immunized child rarely gets infected with diseases while the caregivers in the control group were generally not sure whether an immunized child rarely gets infected with diseases (Table 1).

The caregivers were asked whether they thought immunization increases children's immunity. 9.6% and 95% of the caregivers in the intervention group and 6.8% and 22.3% of the caregivers in the control group believed that immunization increases children's immunity before and after intervention respectively. Similarly, arithmetic mean of 4.79 and 2.98 for the intervention and control groups respectively implied that the caregivers on the intervention group generally strongly believed that immunization increases children's immunity while the caregivers in the control group were generally not sure whether immunization increases children's immunity (Table 1).

The caregivers were asked whether they thought immunization prevents children from getting some diseases like poliomyelitis and tuberculosis. 8.5% and 95.2% of the caregivers in the intervention group believed that immunization prevents children from getting such diseases before and after intervention as compared to 8.1% and 29.4% of the caregivers in the control group respectively.

Equally, arithmetic mean of 4.79 and 2.99 for the intervention and control groups respectively implied that the caregivers on the intervention group generally strongly believed that immunization prevents children from getting some diseases like poliomyelitis and tuberculosis while the caregivers in the control group were generally not sure whether immunization prevents children from getting the same diseases (Table 1).

The general perception of the caregivers on the benefits of immunization services was established by obtaining the arithmetic means of the list of items presented in Table 1 for each of the caregivers. Most of the caregivers in the intervention group (85.3%) regarded immunization as very highly beneficial to their children while most of the caregivers on the control group (54.3%) regarded the services as moderately beneficial to their children (Table 2). On perceived risks of immunization the caregivers were asked whether they thought immunization can cause diseases. The percentage of caregivers in the intervention group which believed that immunization causes diseases decreased from 6.2% to 0.3% before after intervention, whereas in the control group the number increased from 2.3% to 6.3% respectively.

Equally, arithmetic mean of 1.15 and 2.34 for the intervention and control groups respectively showed that the caregivers on the intervention group generally strongly objected that immunization can cause diseases while the caregivers in the control group generally objected that immunization can cause diseases (Table 3).

The caregivers were asked whether they thought immunization can cause injuries. 4.5% and 1.3% of the caregivers in the intervention group and 4.6% and 16.8% of the caregivers in the control group before and after intervention respectively, believed that immunization can cause injuries. Similarly, arithmetic mean of 1.22 and 2.57 for the intervention and control groups respectively showed that the caregivers on the intervention group generally strongly objected that immunization can cause injuries while the caregivers in the control group were generally not sure that immunization can cause injuries (Table 3).

The caregivers were asked whether they thought immunization can lead to future health problems for their children. 3.8% and 0.5% of the caregivers in the intervention group and 2.8% and 16.4% of the caregivers in the intervention group before and after intervention respectively, believed that immunization can lead to future health problems for their children. Similarly, arithmetic mean of 1.22 and 2.49 for the intervention and control groups respectively showed that the caregivers on the intervention group generally strongly objected that immunization can lead to future health problems for their children while the caregivers in the control group generally objected, though not strongly, that immunization can lead to future health problems for their children (Table 3).

The general perception of the caregivers on the risks of immunization services was established by obtaining the arithmetic means of the list of items presented in Table 3 for each of the caregivers. Most of the caregivers in the intervention group (85.5%) regarded the risk factor associated with immunization as very low while most of the caregivers on the control group (43.1%) regarded the risk factor associated with immunization as moderate

(Table 4). Under inferential analysis, hypothesis testing on the association between the caregivers' perceptions on immunization and the uptake of immunization services was done.

Comparative analysis on the perception of the caregivers on immunization between the intervention and control group was also conducted. Perception of the caregivers focused on two aspects which were; perceived benefits of immunization and perceived risks of immunization. On the perceived benefits of immunization, these are the hypotheses that were tested.

H₀₁

There is no significant difference on the perceived benefits of immunization by the caregivers between the intervention and control group

H₀₂

There is no significant association between the perceived benefits of immunization by the caregivers and the uptake of immunization services.

On the perceived risks of immunization, these are the hypotheses that were tested.

H₀₃

There is no significant difference on the perceived risks of immunization by the caregivers between the intervention and control group

H₀₄

There is no significant association between the perceived risks of immunization by the caregivers and the uptake of immunization services.

On the perceived benefits of immunization hypotheses, the p values for both H₀₁ and H₀₂ were less than the level of significance implying that we reject the null hypotheses in favour of their respective alternative hypotheses. On the first hypothesis H₀₁, the findings implied that there is a significant difference on the perceived benefits by the caregivers on immunization between the intervention and control group. On the second hypothesis H₀₂, these results suggested that there is a significant association between the perceived benefits of immunization by the caregivers and the uptake of immunization services. This implies that the perceived benefits of immunization by the caregivers on immunization significantly influence their uptake of the immunization services (Table 5).

On the perceived risks of immunization hypotheses, the P values for both H₀₃ and H₀₄ were less than the level of significance implying that we reject the null hypotheses in favour of their respective alternative hypotheses. On the first hypothesis H₀₃, the findings implied that there is a significant difference on the perceived risks of immunization by the caregivers between the intervention and control group.

On the second hypothesis H₀₄, these results suggested that there is a significant association between the perceived risks of immunization by the caregivers and the uptake of immunization services (Table 6).

Table 1: Perception of the caregivers on the benefits of immunization.

Statements		SD		D		NS		A		SA		Mean±SD
		N	%	N	%	N	%	N	%	N	%	
Immunization makes children grow well	I	0	0	2	0.5	16	4.1	46	11.6	331	83.8	4.79±0.529
	C	6	1.6	84	21.8	189	49.1	85	22.1	21	5.5	3.08±0.845
An immunized child does not get diseases frequently	I	0	0	2	0.5	21	5.3	40	10.1	332	84.1	4.78±0.557
	C	4	1	106	2.5	172	44.7	79	20.5	24	6.2	3.03±0.879
Immunization increases children's immunity	I	0	0	1	0.3	19	4.8	41	10.4	334	84.6	4.79±0.526
	C	2	0.5	116	30.1	181	47	61	15.8	25	6.5	2.98±0.861
Immunization prevents children from getting some diseases like poliomyelitis and tuberculosis	I	0	0	3	0.8	16	4.1	42	10.6	334	84.6	4.79±0.542
	C	3	0.8	137	35.6	132	34.3	85	22.1	28	7.3	2.99±0.949

SD = Strongly Disagree; D = Disagree, NS = Neither disagree nor agree, A = Agree, AS = Strongly Agree

Table 2: General perception of the caregivers on the benefits of immunization.

Arithmetic mean	Benefit	Intervention		Control	
		N	%	N	%
1.0-1.4	Very lowly beneficial	0	0	0	0
1.5-2.4	Lowly beneficial	0	0	69	17.9

Continued.

Arithmetic mean	Benefit	Intervention		Control	
		N	%	N	%
2.5-3.4	Moderately beneficial	17	4.3	209	54.3
3.5-4.4	Highly beneficial	41	10.4	85	22.1
4.5-5.0	Very highly beneficial	337	85.3	22	5.7
Total		395	100	385	100

Table 3: Perception of the caregivers on the risks of immunization.

Statements		SD		D		NS		A		SA		Mean±SD
		N	%	N	%	N	%	N	%	N	%	
Immunization can cause diseases	I	343	87.3	42	10.7	7	1.8	1	0.3	0	0	1.15±0.423
	C	52	13.5	179	46.5	130	33.8	21	5.5	33	8.8	2.34±0.807
Immunization can cause injuries	I	330	83.5	49	12.4	11	2.8	5	1.3	0	0	1.22±0.550
	C	41	10.6	152	39.5	127	33	61	15.8	4	1	2.57±0.916
Immunization can lead to future health problems for the child	I	322	81.6	60	15.2	11	2.8	2	0.5	0	0	1.22±0.510
	C	52	13.5	154	40	124	32.3	49	12.7	6	1.6	2.49±0.933
	C	343	87.3	42	10.7	7	1.8	1	0.3	0	0	1.15±0.423

SD = Strongly Disagree; D = Disagree, NS = Neither disagree nor agree, A = Agree, AS = Strongly Agree.

Table 4: General perception of the caregivers on the risks of immunization.

Arithmetic mean	Risk factor	Intervention		Control	
		N	%	N	%
1.0-1.4	Very low	338	85.5	35	9.1
1.5-2.4	Low	48	12.2	159	41.2
2.5-3.4	Moderate	8	2.0	166	43.1
3.5-4.4	High	1	0.3	23	6.0
4.5-5.0	Very high	0	0	2	0.6
Total		395	100	385	100

Table 5: Hypotheses on the perceived benefits of immunization.

Hypothesis	Test	P value	Level of significance	Decision
H ₀₁	Mann Whitney U-test	0.00	0.05	Reject the null hypothesis
H ₀₂	Chi square-test	0.00	0.05	Reject the null hypothesis

Table 6: Hypotheses on the perceived risks of immunization.

Hypothesis	Test	P value	Level of significance	Decision
H ₀₃	Mann Whitney U-test	0.00	0.05	Reject the null hypothesis
H ₀₄	Chi square-test	0.00	0.05	Reject the null hypothesis

DISCUSSION

The benefits that caregiver attach to immunization greatly influence the immunization status of their children. The high immunization coverage observed among the intervention group than the control group could be explained as a beneficial factor that caregivers attached to the immunization since most of the caregivers in the intervention group (85.3%) regarded immunization as very highly beneficial to their children while most of the caregivers on the control group (54.3%) regarded the services as moderately beneficial to their children.

Most of the caregivers in the intervention group (84.6%) believed that immunization increases children’s immunity while most of the caregivers in the control group (47%) were not sure whether immunization increases children’s immunity. A higher percentage of caregivers in the intervention group also believed that an immunized child rarely gets infected with diseases and possess higher immunity than unimmunized as compared to control group. In reference to a different study, maternal knowledge was a factor influencing immunization of children under five years. Knowledge on benefits of immunization was significantly associated with the immunization uptake ($p=0.00, \alpha=0.5$).^{1,10}

The perception of caregivers on immunization services greatly improved in the intervention group after the intervention as compared to the control group. Caregivers in the intervention group believed that immunization significantly contributes to the well growth of their children and this tremendously improved their immunization uptake compared to their counterparts in the control group. This is in line with a qualitative study conducted in Uganda that caregivers' perceptions on the benefits of immunization affect their decisions on immunization uptake.^{7,15}

The perception of caregivers on the safety (risks) of immunization to the children also greatly affected the immunization uptake among caregivers. Most of the Caregivers in the intervention group perceived immunization as less risky as they believed that vaccines were safe for their children after intervention as compared to their counterparts in the control group, hence increasing immunization uptake among the intervention than the group. In reference to a different study it was also found out that, caregivers negative perception on the safety of the vaccine negatively impacted on their immunization uptake.^{7,19}

It was also established that negative perception of caregivers on the safety of immunization services was the reason for low coverage of routine immunization of children.^{8,14} Adverse events following immunizations (AEFI) also hampered effective routine immunization among caregivers with less information on immunization services in rural areas.²

CONCLUSION

Most of the caregivers in the intervention group regarded immunization as very highly beneficial to their children while most of the caregivers on the control group regarded the services as moderately beneficial to their children. Most of the caregivers in the intervention group regarded the risk factor associated with immunization as very low while most of the caregivers on the control group regarded the risk factor associated with immunization as moderate.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

- Galadima AN, Zulkefli NAM, Said SM, Ahmad N. Factors influencing childhood immunisation uptake in Africa: a systematic review. BMC Public Health. 2021;21(1):1475.
- Malande OO, Munube D, Afaayo RN, Annet K, Bodo B, Bakainaga A, et al. Barriers to effective uptake and provision of immunization in a rural district in Uganda. PLoS One. 2019;14(2):0212270.
- Neil DA, Mueller M, MacDonald S, McDonald S, Saini V, Kellner JD, Tough S. Maternal perceptions of childhood vaccination: explanations of reasons for and against vaccination. BMC Public Health. 2019;19(1):49.
- Namuwaya. Immunization coverage. New vision. 2017.
- WHO, UNICEF. WHO UNICEF Immunization Coverage Estimates, 2019. Available at: https://www.who.int/immunization/monitoring_surveillance/routine/coverage/WUENIC. Accessed on 23 September 2021.
- WHO. Introduction of Inactivated Polio Vaccine (IPV) in Routine Immunizations, 2019. Available at: https://www.who.int/immunization/diseases/poliomyelitis/inactivated_polio_vaccine/ipv_operational_manual. Accessed on 23 September 2021.
- Braka F, Asimwe D, Soud F, Lewis RF, Makumbi I, Gust D. A qualitative analysis of vaccine safety perceptions and concerns among caretakers in Uganda. Matern Child Health J. 2012;16(5):1045-52.
- Panika, Kumar R, Guleri SK. Assessment of Awareness of Caregivers on Childhood Immunization and Reasons for Incomplete Immunization in Damoh District Madhya Pradesh. J Med Sci Clin Res. 2019;7(5):314-20.
- Yousif MA, Abdallah AM, Elbur A. Parents' knowledge and attitudes on childhood immunization, Taif, Saudi Arabia. J Vaccines Vaccin. 2013;5(2):215.
- Bystrom E, Lindstrand A, Roth A. Attitudes towards vaccinations in the National Immunization Program among parents in Sweden 2016. European J Public health. 2017;27:150-2.
- Donfouet HPP, Agesa G, Mutua MK. Trends of inequalities in childhood immunization coverage among children aged 12-23 months in Kenya, Ghana, and Côte d'Ivoire. BMC Public Health. 2019;19(1):988.
- Elran B, Yaari S, Glazer Y, Honovich M, Grotto I, Anis E. Parents' perceptions of childhood immunization in Israel: Information and concerns. Vaccine. 2018;36(52):8062-8.
- Favin M, Steinglass R, Fields R, Banerjee K, Sawhney M. Why children are not vaccinated: a review of the grey literature. Int Health. 2012;4(4):229-38.
- Frew PM, Lutz CS. Interventions to increase pediatric vaccine uptake: An overview of recent findings. Hum Vaccin Immunother. 2017;13(11):2503-11.
- Adetola AO, Okafor OJK, Balogun MR. Maternal knowledge, attitude and compliance regarding immunization of under five children in Primary Health Care centres in Ikorodu Local Government Area, Lagos State. J Clin Sci. 2019;16(1):7.
- Sarfraz M, Athira A, Thotamsetty LMD, Ravilla SA, Nadikudi N, Doddayya H. Assessment of knowledge, attitude and perception among mothers

- towards immunization in a tertiary care teaching hospital. *Int J Community Med Public Health*. 2017;4:3429-35.
17. Mutua MK, Murage E, Ngomi N, Ravn H, Mwaniki P, Echoka E. Fully immunized child: coverage, timing and sequencing of routine immunization in an urban poor settlement in Nairobi, Kenya. *Trop Med Health*. 2016;44:13.
 18. Šeškutė M, Tamulevičienė E, Levinienė G. Knowledge and Attitudes of Postpartum Mothers towards Immunization of Their Children in a Lithuanian Tertiary Teaching Hospital. *Medicina*. 2018;54(1):2.
 19. Vonasek BJ, Bajunirwe F, Jacobson LE, Twesigye L, Dahm J, Grant MJ, et al. Do Maternal Knowledge and Attitudes towards Childhood Immunizations in Rural Uganda Correlate with Complete Childhood Vaccination? *PLoS One*. 2016;11(2):150131.
 20. Wani TR, Dar H, Raina ZA. Knowledge, Attitude and Practices of Mothers with Children Under Five Years of Age About Vaccination. *J Med Sci Clin Res*. 2017;5(7):24449-54.

Cite this article as: Topher B, Margaret KM, Eliphas G. Perceptions of caregivers on immunization in Ntungamo district, Uganda. *Int J Community Med Public Health* 2021;8:5729-35.