

ORIGINAL ARTICLE

EFFECT OF INTERPERSONAL COMMUNICATION TRAINING PROGRAM ON CHILD'S IMMUNIZATION AMONG MOTHERS LIVING IN KEBBI STATE OF NIGERIA

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Background: Sharing of information through health education training of mothers on child vaccination has proved an effective intervention for better outcome and increased immunization coverage. This study aimed to examine the effect of interpersonal communication (IPC) training program on mothers' knowledge of child's vaccination and routine childhood immunization uptake in local government areas (LGAs) of Kebbi State, Nigeria. **Methods:** A quasi-experimental study was conducted in two local government areas in Kebbi State, from October 2016 to March 2017. Four hundred twenty mothers participated in the study and were allocated equally (210) in both intervention and control group (n=210) and data were collected on vaccination status of the children after intervention from children's vaccination cards and mother's verbal reports. Independent t test and Chi-square were used to test the effect of intervention on mother's knowledge of child's vaccination and routine childhood immunization uptake between intervention and control group. Study was ethically approved from the review board of Ministry of Health, Nigeria. **Results:** Mean knowledge scores has improved in the intervention group (M = 5.42, SD = 3.35) and control group (M=1.96, SD=2.37) after intervention with $p < 0.001$. Routine childhood immunization uptake fully immunized (53.8% vs. 9.5%), partially immunized (16.6% vs. 32.8%) and un-immunized (29.5% vs. 57.6%) in both group after intervention with $p < 0.001$. Approximately fifty-four percentages of children in the intervention group were fully immunized after intervention. However, there was minimal change of 2% has been observed in control group. Percentage of unimmunized children was high in both groups at pre-intervention (66%) but this decreased to 29.5% in the intervention group and 57.6% in the control group. **Conclusion:** This study concludes that, IPC skill is an effective intervention and a sustainable service for improving the knowledge and uptake of mother's face-to-face education, social mobilization and reminder services about routine childhood immunization within entire population.

Keywords: Immunization; Effectiveness; Knowledge; Interpersonal communication skills and training

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INTRODUCTION

Expanded Programme on Immunization (EPI) was launched in 1974 by WHO to ensure all children worldwide had access to routinely recommended vaccines.¹ Despite decades of progress in improving the availability of childhood immunization services, many countries including Nigeria still experience high level of infant and child mortality rates. Nearly half of the global children under 5 years of age deaths occurred in only 5 countries due to Preterm birth Complications, Measles, Pneumonia, Neonatal Sepsis, Malaria, Diarrhea and Meningitis: India (21%), Nigeria (13%), Pakistan (6%), Democratic Republic of the Congo (5%) and China (4%).² These deaths could have been averted with full immunization of children.

Previous studies reported several factors as possible mitigating factors of poor vaccination coverage in developing/low-income countries including Nigeria. These include parental attitude and mothers' poor knowledge of immunization benefits, lack of political will, ignorance, cultural/religious aversion to vaccine acceptance or use, misconception of vaccine safety, communication and information and family characteristics.^{3,4} Other reasons include concerns about long distance and non-availability of health staff, lack of training and poor access of health facility.⁵ Most of the issues were related with lack of proper information on immunization. Mothers' knowledge on proper vaccination for their children has proven effective strategy in previous research.^{5,6} However, research evidence is highly recommended for communication and training of mothers in

immunization coverage at rural setup^{7,8}, right information will also benefit in timely decision as well.⁹

In 2015, Kebbi state was recorded among the four states in the north-western Nigeria that had low routine immunization performance in the country. This indicated that only 7.8% of the eligible children had received 3 doses of DPT Penta vaccine (diphtheria pertussis (whooping cough) tetanus, Hepatitis B and Hemophilus Influenzae type B and measles vaccine coverage was 14.7% in 2015.⁵ Under-5 mortality rate in the State was 185/1000 live birth and infant mortality rate was 89/1000 live birth. These attributed in recording high rate of vaccine – preventable diseases in the state.¹⁰

However, there were no documented research studies to investigate the effect of interpersonal communication skills on routine immunization services in Kebbi State of north-western Nigeria. Previous studies on the effect of training of health workers on communication skills were carried out in other low resource countries.¹¹ There was lack of attention in training of primary health workers on the interpersonal communication skills on routine immunization services at the State/LGA level, and most of the communication interventions directed to health workers were in the context of immunization campaigns.¹¹ The objective of this study therefore, is to examine the effect of interpersonal communication (IPC) training program on improving both mothers' knowledge of child's vaccination and routine childhood immunization uptake in Kebbi State, Nigeria.

MATERIAL AND METHODS

A quasi-experimental study design by involving on mothers of children 12–23 months of age were conducted in two LGA were randomly assigned to intervention and control groups. The sample size of 420 mothers were determined by using World Health Organization (WHO) immunization coverage cluster survey.¹² A two - stage cluster sampling technique was used. Four wards, 15 clusters and 15 households from each cluster were randomly selected. One child, was included from selected household, next household was approached incase absence of child in that house.¹² Inclusion criteria include child's mother while migrant households and household plan to leave the community within the period of study, unable to communicate and those with severe sickness were excluded. The content validity of the questionnaire was pretested with the Index of item objective congruence (IOC) by three experts on other similar population taking 5% of the total sample and necessary modification were made to

suite the content of this study. All questions were tested for reliability by means of pilot-testing with 30 mothers in an area with similar characteristics. The internal consistency reliability of knowledge questions was tested by Kuder-Richardson Formula 20 score (KR20)¹⁴ and the result score was 0.60. The questionnaire consisted of three parts. First was socio-demographic characteristics of mothers and children, second part included variables related to knowledge regarding routine immunization and vaccine preventable diseases, third part included vaccination status of children based on vaccination card or mothers verbal report and utilization of routine immunization services. Correct response was scored and mothers considered with low knowledge had score below four and with high knowledge had score of five.¹⁵ Vaccines given to child with an interval of four weeks were included as a valid dose.^{12,15} BCG vaccine scar was an evident of immunization and others were availability of card or hospital record etc.¹² Coverage was assessed as fully immunized, partially immunized, or un-immunized.¹⁰ Data for the study were collected from the mothers using a structured questionnaire on immunization for children 12–23 months of age adapted form World Health Organization.¹¹ The primary respondents were mothers of children 12–23 months of age. The data for the study were collected using ten primary health care workers and two health professional supervisors selected and thoroughly trained on data collection. Data collected were analyzed using IBM SPSS version 22. Ethical approval was obtained from Kebbi state Ministry of Health Ethical Research Committee Board prior to the commencement of the study. Written consent was obtained and participants were briefed prior to start the interview.

The intervention comprised two components:

Component One: Training of PHC workers on strengthening of interpersonal communication skills on childhood routine immunization services. Twelve PHC workers from each of the two-selected intervention wards, totaling 24 PHC workers took part in the training. The training lasted for a period two and half day at the varied times usually when the workers closed from duty. Each session lasted 3 hours. A combination of different training methods utilized for the training included use of manual on strengthening IPC Skills of PHC workers.¹³

Component Two: Implementation of the interpersonal communication skills. This was basically applying IPC skills during immunization session via direct communication with the mothers at fixed or outreach session and house to house visits for tracking missed opportunities.

RESULTS

As shown in Table 1, basic information of four-hundred twenty participants in the intervention (n=210) and control groups (n=210) indicated that there was no significant difference in baseline characteristics of both groups. More than half of the respondents (62.8% and 61.4%) of mothers among groups were within the age bracket of 21-30 years. The predominant religion of the mothers in both groups was Islam (100% and 99.5% respectively). Half of the mothers in both intervention and control group (50.9% and 50.4% respectively) were engaged on petty trading, (42.8% and 44.2%) of respondents in two groups were full housewife, and only (6.6% and 5.2%) of mothers in both groups were government employee. Regarding income of mothers, 80.4% and 83.8% of mothers in the intervention and control group had income level between N100 to N200 (1USD = N357) per month, 10.9% and 9.0% of the respondents had income level between N200 to N300 (1USD = N357) per month and 8.5% and 7.1% of the respondents had more than N300 (1 USD = N357) per month. More than half 59% of mothers in both groups did not attend formal education, 25.7% completed primary school, 10% had completed senior secondary school that is 6 years of education after primary school, while only 5.4% had qualification of higher than secondary school and was found no significant difference with education of mothers. Regarding the number of mothers living children 37.1% of mothers had between three to four children and 28.1% had between five to eight children while 34.7% had children between one to two children. Regarding sex 50.4% female and 49.5% male.

The percentage of mothers who answered correctly to knowledge questions regarding routine childhood immunization as shown in Table 2. Approximately sixty percentages of the respondents in the intervention group were aware of routine immunization after intervention, while for the control group there was 3.8% increase. More than half (61.9%) of the mothers in the intervention knew vaccine preventable diseases after intervention. While for the control group it was 23.3% after intervention. 54.7% of the mothers in the intervention group can mention 5 to 6 types of vaccine preventable diseases after the intervention. However, the percentage for the control group was 15.2% after intervention. 57.6% of mothers knew the causes of childhood vaccine preventable diseases after intervention while the control group is only 18.5%. Mothers in the intervention group after intervention who can name the types of childhood vaccination are 54.2%, while only 15.2% in the control group. 53.3% of the respondents in the intervention group knew the

importance of immunization after intervention and the control group was 16.1%. Mothers who knew the number of visits to complete their child immunization schedule in the intervention group was 53.8% after intervention and the control group was 15.2%. 55.2% of mothers in the intervention group knew the age at which the child immunization begins and complete immunization after intervention and for the control group was 16.1%. 34.2% of the respondents in the intervention group knew vaccine side effects after intervention and for the control group is only 11.0%.

Table 3 showed the results of independent t-test to compare the knowledge scores of mothers at baseline and end-line (after intervention) for the intervention and control groups. The mean difference of knowledge scores (Endline – Baseline) (M=3.40, SD=3.04) in intervention group were statistically significantly higher than the mean difference of knowledge scores (Endline-Baseline) (M=0.02, SD=1.20) in the control group. The mean difference of knowledge scores 3.40 between baseline and end-line in the intervention group indicated that knowledge of mothers on routine childhood immunization increased after intervention. Meanwhile, the mean difference of knowledge scores 0.02 between baseline and end line in the control group illustrated that knowledge of mothers on routine childhood immunization has a slight increase.

There was no statistically significant difference between knowledge scores of interventions (M=2.01, SD=2.99) and control group (M=1.94, SD=2.86) at the baseline. However, there was a statistically significant difference between knowledge scores of interventions (M=5.42, SD=3.35) and control group (M=1.96, SD=2.37) at endline.

As illustrated in Table 4, the status of immunization for the two groups was compared at both pre- and post-intervention. There was marked increase of children fully immunized in the intervention group from 7.1% before intervention to 53.8% after intervention compared to control group where the increase was only 2% from 7.6% at pre-intervention to 9.5% after intervention. There was also remarkable reduction of un-immunized children in the intervention group from 66.6% at pre-intervention to 29.5% after intervention unlike the control group where the reduction was 8.5% from 66.1% at pre-intervention to 57.6% after intervention. There was statistically significant difference in the proportion (percentage) of routine childhood immunization uptake *Fully immunized* (53.8% vs. 9.5%), *Partially immunized* (16.6% vs. 32.8%) and *Un-immunized* (29.5% vs. 57.6%) between intervention and control group after intervention with $p < 0.001$

Table-1: Baseline information of both groups (n=420)

Variable	Intervention (n=210)		Control (n=210)		p-value [‡]
	Number	Percent	Number	Percent	
Age of Mother					0.906
< 20 years	11	5.24	9	4.29	
21 - 30 years	132	62.86	129	61.43	
31- 40 years	60	28.57	63	30.00	
41 - 50 years	7	3.33	9	4.29	
Number of Children					0.652
1 - 2 Children	73	34.76	65	30.95	
3 - 4 Children	78	37.14	86	40.95	
5 - 8 Children	59	28.10	59	28.10	
(Min 2 and Max 4) (Mean ± SD 3.05 ± 0.780)					
Religion					0.500 [‡]
Islam	210	100	209	99.52	
Christianity	0	0	1	0.48	
Ethnicity					0.873
Hausa	186	88.57	183	87.14	
Fulani	9	4.29	11	5.24	
Zabarma and Others	15	7.14	16	7.62	
Educational Level					0.964
No Formal Education	121	57.62	126	60.00	
Complete Primary	55	26.19	53	25.24	
Completed Secondary	22	10.48	20	9.52	
Higher Than Secondary	12	5.71	11	5.24	
Marital Status					0.805 [‡]
Married	202	96.19	200	95.24	
Divorced	6	2.86	6	2.86	
Widow	2	0.95	4	1.90	
Occupation					0.797
House wife	89	42.38	93	44.29	
Petty Trading	107	50.95	106	50.48	
Employed	14	6.67	11	5.24	
Daily Income					0.672
N100 - N200 (0.28 USD - 0.56 USD)	169	80.48	176	83.81	
N200 - N300 (0.56 USD - 0.84 USD)	23	10.95	19	9.05	
Above N300 (1 USD - 2 USD)	18	8.57	15	7.14	

Significant Level at p-value <0.05 [‡]Chi-Square test [‡]Fisher's Exact test

Table-2: Percentage of correct answers of mothers Knowledge on routine childhood immunization

immunization before and after intervention Variables	Intervention Group (n=210)		Control Group (n=210)	
	Baseline N (%)	Endline N (%)	Baseline N (%)	Endline N (%)
Awareness on routine immunization	70 (33.3)	125 (59.5)	71 (33.8)	79 (37.6)
Knowledge on vaccine preventable diseases	34 (16.1)	130 (61.9)	39 (18.5)	49 (23.3)
Knowledge on types of vaccine preventable diseases	30 (14.2)	115 (54.7)	32 (15.2)	32(15.2)
Knowledge on causes of childhood vaccine preventable diseases	34 (16.1)	121 (57.6)	39 (18.5)	39 (18.5)
Knowledge on types of childhood vaccination	30 (14.2)	114 (54.2)	32 (15.2)	32 (15.2)
Knowledge on importance of immunization	28 (13.3)	112 (53.3)	30 (14.2)	34 (16.1)
Knowledge on number of visit to complete child immunization	33 (15.7)	113 (53.8)	29 (13.8)	32 (15.2)
Knowledge on age child begins and complete immunization	23 (11.0)	116 (55.2)	18 (8.5)	34 (16.1)
Knowledge on adverse reaction to vaccination	20 (9.5)	72 (34.2)	17 (8.0)	23 (11.0)

Table-3: Comparison of routine childhood immunization knowledge scores among intervention and Control group at baseline and endline

Variable	Total	Intervention group	Control group	95 % Confidence Intervals of the difference		p-value [‡]
	(n=420)	(n=210)	(n=210)	Lower	Upper	
		Mean (SD)	Mean (SD)			
Mean Differences of Knowledge (Endline – Baseline)		3.40(3.04)	0.02(1.20)	2.942	3.829	<0.001 *
At Baseline		2.01(2.99)	1.94(2.86)	-0.486	0.638	0.790
At Endline		5.42(3.35)	1.96(2.37)	2.905	4.019	<0.001 *

* Statistically significant (p <0.05) [‡] Independent t-test

Table-4: Routine childhood immunization uptake (Fully immunized, Partially immunized, Un-immunized) before and after intervention

Variables	Intervention vs. control (baseline)		p-value [‡]	Intervention vs. control (endline)		p-value [‡]
	Before (n=210)	Before (n=210)		After (n=210)	After (n=210)	
Fully Immunized	15 (7.1%)	16 (7.6%)	<0.982	113 (53.8%)	20 (9.5%)	<0.001*
Partially Immunized	55 (26.2%)	55 (26.2%)		35 (16.6%)	69 (32.8%)	
Un-Immunized	140 (66.7%)	139 (66.2%)		62 (29.0%)	121 (57.6%)	

*Statistically significant ($p < 0.05$) [‡] Chi-square test

DISCUSSION

Regular health education, direct interaction and reminder for the next schedule provided to mother during immunization session by primary health care workers had increased the knowledge of mothers in improving the practices regarding the utilization of immunization services in the intervention group. These findings are supported by other studies.^{16,17} Other studies conducted in Sokoto Northern Nigeria is also supporting this finding^{18,19} which revealed that counselling of mothers by health workers during postnatal clinic promoted child immunization and increased coverage. Study in Pakistan²⁰ also reported an increase of 31% of DPT3 completion among children of mothers who received primary health care center-based education on their immunization visit.

Knowledge of mothers about childhood immunization was not appropriate that could not be helpful for vaccination of their children. In assessing the socio-demographic characteristics of the subjects, 59% of the participants had low literacy level and did not acquire formal education. In the study²¹ reported that, significant vaccination status was found among children with both literate parents as compared to children with both parents who are illiterates. Many researchers reported that educational intervention in better and very effective while improving the vaccine coverage among children.

Most of mothers do not know about how routine immunization can prevent their child from infections and diseases.²² Human body develops antibodies against particular vaccine after administration of at least two doses of vaccine. Very few respondents had a proper knowledge about the development of immunity after vaccination.²³

Parental literacy has positive relationship with child immunization access to health services. This is similar with study conducted by Mathew's systematic review study.²⁴ The result of this study indicated that lack of awareness against vaccine preventable diseases was high (85.2%) among the study participants and very few (14.8%) obtained information from health workers and community mobilizers. The findings of the current study are in consonance with the findings of one study²² in the United Arab Emirate where only 16% of the

respondents in the study obtained information from the health workers.

Intervention has proved that around half of the child has completed their immunization status as compare to control group. Similar results were seen in the study conducted in Nigeria, where intervention had positive effects on vaccine coverage.²⁵ The coverage of full immunization reported here was found to be below the national goal of 80% set in every district as reported by the Nigeria.¹⁰

CONCLUSION

Study concludes that the interpersonal communication training intervention was effective in improving the uptake of routine immunization at PHC levels in Nigeria.

AUTHORS' CONTRIBUTION

SAB conceived and designed this research, RK has drafted the paper, PV analyzed the data, MBY collected data and RS supervised and finalized this paper.

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