

Factors Associated With Dropout Between Bacille Calmette Guerin (BCG) and Measles Vaccination in A Village Development Committee of A District

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ABSTRACT

Background: The Expanded Programme on Immunization is one of the first priorities of the Government of Nepal. The high national dropout rate (11.3%) demonstrates that immunization opportunities are lost as approximately one of every nine children in contact with immunization services are slipping “out of the system” before the age of 12 months. This study is an attempt to explore the situation of the enhancing factors for dropout.

Objectives: The main objective of the study was to identify the reasons of dropout between BCG and Measles vaccination in Kapan Village Development Committee (VDC) of Kathmandu district.

Methods: This was a descriptive study, of children ranging from 12 to 23 months of age residing in Kapan VDC. (N=81) mothers were interviewed to obtain the information.

Results: The study revealed that Magar/Gurung in the area were found to dropout more (78.6%). Female children were more likely to dropout than male children. About 70% of children dropout were from labor class, and/or illiterate families. Majority of the mothers (42.5 %) said that the child was ill so they did not go for routine vaccination. However, 50.7% of dropout children received quality care. These findings were corroborated with the findings of key informant interview.

Conclusions: The major reason of dropout of measles vaccine was found to be the perceived contraindication regarding the immunization.

Keywords: BCG versus Measles, Dropout, Immunization

INTRODUCTION

Expanded program on immunization (EPI) is the one of the first priorities (p1) of The Government of Nepal.^{1,2} The immunization Coverage survey shows that >90% target population is reached with one or more immunization doses but only 65.6% complete the course by age one year. If this dropout rate is reduced, the coverage will automatically increase.³ Low coverage of measles vaccination indicates that a bigger pool of unimmunized children exist every year. This explains frequent outbreak of measles every now and then.⁴

The highest dropout rate is observed in the Central Development Region with 15.4%,⁵ where Kapan VDC alone had 13.6% of dropout. If the dropout rate is less than 10%, there is no problem with the utilization of the immunization services. On the contrary, if the dropout rate is $\geq 10\%$, then there is a problem with the utilization of the immunization services indicating poor utilization of immunization services.⁶ The possible reasons for high dropout will be identified by this study. It will be useful for designing effective interventions to address high coverage of routine immunization.

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METHODS

The descriptive study was carried out in Kapan VDC. Children of age 12-23 months were the study population. 40 Children of 12-23 months of age who had not received measles vaccine but had received BCG vaccine were traced out from the EPI register of Kapan sub-healthpost. The same proportion of children of same age group who were fully immunized were taken into account for reference. The sample size was 81 for both groups of children. Structured and semi structured questionnaires were used to collect the quantitative information with the mothers. Likewise, key informant interview guidelines were used to collect the qualitative information with sub-health post staff regarding the effective conduction of the EPI program in Kapan VDC. Ethical clearance for research was taken from the Ethical Committee at Department of Community Medicine and Public Health, Maharajgunj Medical Campus, Institute of Medicine. Informed verbal consent was taken prior to data collection. The collected data were entered, cleaned, processed and analyzed into SPSS 16 version.

RESULTS

By ethnicity majority (48.1%) were Brahmin and Chhetri followed by Magar/Gurung (17.3%) and Kami, Damai, Sarki (KDS) (10%). Most of the mothers (48.1%) were illiterate followed by those who had received primary education (22.2%). Majority of the fathers (37%) were found to be engaged in labor as their main occupation with 35.8% service holders and only 11% in agriculture. Majority of the family (54.3%) paid rent for accommodation and the rest (45.7%) owned their own house.

Ethnicity, sex, type of residence and vaccination status

Majority of the dropout children were from Magar/Gurung ethnic group (78.6%) followed by Lama (71.4%). None of the children were found to be dropouts from Newar ethnic group. Ethnicity was significantly associated with the vaccination status of the children (Table 1).

In this study more than half of the children (59.3%) were male, with 40.7% females. Female children were more likely to dropout than male children (57.6% Vs 43.8%) though sex and vaccination status were not significantly associated (Table 2).

A majority of the respondents (54.3%) rent the house whereas 45.7% of the respondents own the house. There were greater dropouts among mothers who rented their house than the mothers who owned their own (61.4% versus 35.1%) (Table 3).

Table 1. Vaccination status by ethnicity of the respondents

Ethnicity	Vaccination status		Total	P value
	Fully immunized	Dropout		
Brahmin/chhetri	25 (64.1)	14 (35.9)	39 (48.1)	
Magar/Gurung	3 (21.4)	11 (78.6)	14 (17.3)	
Lama	4 (28.6)	10 (71.4)	14 (17.3)	P=0.002
Kami, Damai and Sarki (KDS)	3 (37.5)	5 (62.5)	8 (9.9)	
Newar	6 (100)	-	6 (7.4)	
Total	41 (50.6)	40 (49.4)	81 (100)	

Figures in parentheses indicate percentages.

Table 2. Vaccination status by sex

Sex	Vaccination status		Total	P value
	Fully immunized	Dropout		
Male	27(56.3)	21(43.8)	48(59.3)	
Female	14(42.4)	19(57.6)	33(40.7)	P=0.22
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

Table 3. Vaccination status of children by type of residence

Residence	Vaccination status		Total	P value
	Fully immunized	Dropout		
Rent	17(38.6)	27(61.4)	44(54.3)	
Own	24(64.9)	13(35.1)	37(45.7)	P=0.018
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

Occupation, education, reason of dropout and vaccination status

Significantly 70% of dropout children's fathers were engaged in labor. This was followed by 55.6% of dropout children whose fathers were engaged in agriculture. The dropout rate for children whose fathers were businessmen and service holders was 38.5% and 31.0% respectively (Table 4).

The percentage of dropout children decreases with the increase in their mothers' education level. 69.2% of dropout children were found to have illiterate mothers. Children of mothers with primary, secondary and SLC or above level education were found to be less likely to dropout (38.9%, 28.6%, and 20.0% respectively) . Statistically, there was high significant association

between vaccination status and mother's education (Table 5).

Table 4. Vaccination status by occupational status of father

Occupation	Vaccination status		Total	P value
	Fully immunized	Dropout		
Agriculture	4(44.4)	5(55.6)	9(11.1)	P=0.021
Business	8(61.5)	5(38.5)	13(16.0)	
Service holder	20(69.0)	9(31.0)	29(35.8)	
Labor	9(30.0)	21(70.0)	30(37.0)	
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

Table 5. Vaccination status by mother's education

Educational status	Vaccination status		Total	P value
	Fully immunized	Dropout		
Illiterate	12(30.8)	27(69.2)	39(48.1)	P=0.005
Primary	11(61.1)	7(38.9)	18(22.2)	
Secondary	8(80.0)	2(20.0)	10(12.3)	
10 plus	10(71.4)	4(28.6)	14(17.3)	
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

The primary reason for dropout was because of the child's illness when the vaccination was due (42.5%). The second reason for dropout was because the mothers forgot about vaccination day (30%). The third reason remained the mothers being too busy with their routine work (15.0%). The final reason for the dropout was due to Nepal Bandhs, where EPI sessions were withheld (12.5%) (Table 6).

Table 6. Reason for dropout (n=40)

Reasons for dropout	Number	Percent
Child was ill	17	42.5
Forgot date of vaccination	12	30.0
Busy schedule of mother	6	15.0
No EPI session	5	12.5
Total	40	100.0

A majority of the respondents (54.3%) said that they went for vaccination regardless of their child's illness whereas 34.6 % did not go for vaccination if their child was sick. 11.1% of the respondents did not know what to do in that situation.

Perception about immunizing sick children, quality of care and vaccination status

Children of mothers who thought of not immunizing their children were found to dropout significantly compared to mothers who perceived of giving immunization when

their children were sick (78.6% versus 29.5%). The finding validates the former conclusion as the major reason for dropout Almost 55.6% dropout was found in people who did not know whether to vaccinate when a child was sick (Table 7).

Table 7. Vaccination status by perception about immunizing a sick child

Per-ception	Vaccination status		Total	P value
	Fully immunized	Dropout		
Yes	31(70.5)	13(29.5)	44(54.3)	P=0.000
No	6(21.4)	22(78.6)	28(34.6)	
Don't know	4(44.4)	5(55.6)	9(11.1)	
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

Quality of care was measured by five several service characteristics; the perceived behavior of health workers, waiting time in the clinic, availability of the vaccine, punctuality of health worker in the EPI clinic and regularity of the EPI session.

A majority of the respondents (90.1%) said that the quality of health service was good (all five service characteristics being perfect) whereas just 9.9% of the respondents reported the quality of health service was poor (four or less than four service characteristics being perfect). Almost 50.7% of the dropout children mothers reported the quality of services to be good whereas 37.5% dropout children mentioned the quality of services to be poor. Quality of care has no significant relation with dropout (Table 8).

Table 8. Vaccination status by quality of care of health services

Quality of care	Vaccination status		Total	P value
	Fully immunized	Dropout		
Good quality	36(49.3)	37(50.7)	73(90.1)	P=0.73
Poor quality	5(62.5)	3(37.5)	8(9.9)	
Total	41(50.6)	40(49.4)	81(100.0)	

Figures in parentheses indicate percentages.

Key informant interview

A Sub-healthpost in-charge (SHPI), a village health worker (VHW) and a maternal and child health worker (MCHW) were interviewed to explore barriers for conducting effective immunization along with the causes or problems associated with dropouts. They also provided their own suggestions to improve the utilization of immunization services. All three key informants shared the common opinion that there were

inadequate Information Education and Communication (IEC) materials to motivate and spread awareness among mothers for vaccination, occasional shortage of human resources, particularly, either MCHW or VHW or both for regular conduction of immunization session and inadequate supervisory visit from the district to Sub-health Post (SHP) hindered in effective conduction of immunization session. Similarly, they voiced less priority to health and immunization. Likewise, illiteracy and ethnic minorities (*Janajati*) who work at the carpet industry, were the major attribute of children being not fully immunized. Increment of immunization session, social mobilization regarding vaccination demand and need and more focus in high risk areas (carpet industry, slums and squatters) were the suggestion given by the key informants to enrich high vaccination.

DISCUSSION

Magar/gurung were found to have dropped out significantly (78.6%). This higher percentage was due to the two caste group merged into a single ethnic group. However, lama ethnic group having 71.4% of dropout was the only caste group being dropouts. It was then followed by Kami, Damai and Sarki (KDS) ethnic group comprising of 62.5% dropouts. None of the newar ethnic group were found to have dropped out. The other study revealed that children from scheduled caste families were found to have lower coverage of measles⁷ which somehow support the finding of this study. This is in corroboration with the key informant interview findings where they opined that there were certain ethnic minorities who had been missing the vaccination continuously.

Female children were more likely to dropout than male children (59.3% versus 43.8%). Nepal Demographic and Health Survey (NDHS), 2011 also showed that female children outnumbered the male children with regard to dropout numbers. The other study too revealed that male children were twice as likely to have received vaccine than females.⁸ Therefore, it could be concluded that gender discrimination do exist in our patriarchal society.

Seventy percent of the dropout children's fathers came from labor class backgrounds. 55.6% of dropout children had fathers in agriculture. The percentage of children whose father were businessman or service holders were dropouts by 38.5% and 31.0% respectively. The study carried out in Sydney revealed that the most significant factor associated with partial immunization was socio economic status.⁹ This is also in line with the key informant interview finding which showed illiteracy and ethnic minorities (*Janajati*) working at carpet industries to be poorly immunized or having high dropout.

The percentage of dropout children decreases with increase in mothers' educational level. The study conducted by Jha showed a positive relationship between immunization coverage and educational level of the respondents.¹⁰ Likewise, the study conducted by Dhadwal also found that the increasing maternal education was associated with complete immunization.¹¹ Similarly, the other study conducted in Dharan of Nepal revealed that there was a positive relationship between immunization coverage and educational level of the respondents.¹⁰ This study finding is also in corroboration with the key informant interview finding that illiterate mothers were found to dropout highly.

Mukherjee identified "child ill-not brought" was the important reason for immunization failure in most of the blocks and the other leading reason included mother being too busy.¹² Likewise the other study also supported the finding saying that the major reasons for immunization failures were reported to be illness of child and fear of side reaction.¹³ But the findings reported by routine immunization and NID coverage survey report, 1998, state that the primary reason for dropout was lack of proper services (either the vaccinator was absent or there was a shortage of vaccine).¹⁴ None of the children were found to dropout due to the shortage of vaccine because the study area had sufficient quantity of vaccine and the vaccinator was always present in the EPI session.

Almost 60% of the dropout children mothers reported the quality of services to be good whereas 37.5% mentioned the quality of services to be poor. Since the quality of services were measured based on the five pertinent variables, no other study have accommodated the same variables to make it comparable. Therefore no comparison could be made in this regard. However, one of the studies in Papua New Guinea found that mothers who perceived health worker attitudes as negative tended not to return to the clinic with their children for the 3rd dose.¹⁵ The other study revealed that the timing of the immunization sessions, attitude of service providers, and fear of side effects generally did not deter attendance.¹⁶

Children of mothers who have perceived of not immunizing their sick children were found to dropout significantly compared to mothers who had negative perception immunizing their children when they were sick (78.6% versus 29.5%). This finding validates internally the major reason for dropout as measured through two different approaches.

CONCLUSIONS

The major reason of dropout of measles vaccine was found to be the perceived contraindication regarding

immunization. Local social mobilization activities have to be conducted against the misconception regarding perceived contraindication (ill child-not brought) for vaccination.

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CONFLICT OF INTEREST

There is no any conflict of interest in this study.

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