



# Journal of Nepal Public Health Association (JNEPHA)

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## TABLE OF CONTENTS

### EDITORIAL

- 1 **Opportunities and Challenges of Public Health in Nepal** 5-6  
*Editorial*

### ORIGINAL ARTICLES

- 2 **Impact of Community Based Integrated Management of Childhood Illness Program on Behavior Change of Mothers towards Acute Respiratory Infection in Urawn Ethnic Community of Eastern Nepal** 7-12  
*Arun Kumar Koirala, BS Lall, Neena Gupta, Dipak Kumar Bose, Virgenia Paul*
- 3 **Health Hazards due to Pesticide use and its Protective/Preventive Practice among Vegetable Farmers in Bhaktapur District of Nepal** 13-18  
*Ramanand Pandit, Dillee Prasad Paudel*
- 4 **Newborn Care practices among Mothers in Rautahat District, Nepal** 19-24  
*Ram Chandra Sinha, BS Lal, Binod Regmi, Bhawana Pant*
- 5 **Duration of Stay of People Living with HIV/AIDS in Community Care Centre and its Correlates** 25-28  
*Chirinjivi Adhikari, Arjun Gyawali*
- 6 **Situation of Immunization Coverage in Ethnic Minorities of Dhanusha District of Nepal** 29-32  
*Harischandra Shah, Ranjit Shah*

### REVIEW ARTICLES

- 7 **Scientific Writing and Paper Publication: A Get way of Disseminating and Communicating a Research Finding in Scientific Manner** 33-40  
*Dillee Prasad Paudel*

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**EDITORIAL****Opportunity and Challenges of Public Health in Nepal****Challenges**

Nepal is a country in south Asia, with some perspective challenges regarding healthcare always make a serious concern. Health is a bugging problem for the government of Nepal. There are many issues related to health problems in this exotic country. The health and health care facilities of Nepal were poor and under developed. The main reason responsible for the low standard of health in Nepal is poverty that leads to malnutrition. Health is a developmental agenda in worldwide, In Nepal policy maker peruse the thought, but not seriously taken the health as a developmental agenda for investment.

A growing body of research attests to the changing burden of illness in Nepal. While the unfinished agenda of infection, malnutrition and maternal complications persists in a diversity of settings, continuous outbreak and reemerging of vector borne, tuberculosis and is paralleled by the emergence of chronic vascular disease, diabetes, cancers and lower respiratory conditions, which now constitute the commonest causes of death. Equally, the range of accidents and injuries is prominent, as is growing recognition of mental illness and its consequences. Taken together, this profile characterizes a complex, changing pattern of illness that imposes a significant burden on households and communities, and which through a mix of chronic infectious and non-communicable diseases places quite unfamiliar challenges on health and social systems. The public health system had to address a growing burden of chronic disease, spanning HIV/AIDS and communicable disease, which requires a continuum of care, in particular community based care.

Health systems and the delivery of PHC appear to have greater achievement over the past 2 decades, but not satisfactory in access of health care, while

no single issuer is solely responsible for full of achievement. Poor investment in the public health sector (Prevention), social institutions, and an erroneous belief in the limited role of the state and the importance of the private sector, form the backdrop against which the state of current health systems must be seen. Poor human resource management is a widespread and critical factor, with the effects of accumulated managerial and health care deficiencies clearly apparent. This is underpinned by excessive levels of health worker migration from the public to the private sector, rural to urban settings, or brain drain.

Today, there is unusual flux in health systems thinking, a product of weak system performance, coupled with disappointing progress in meeting prevention targets (Mostly program gives high intense to increase in health facility visit rather than management at community) is another challenging.

**Opportunity**

How should the New Public Health address the healthcare needs of populations worldwide? As stated by the WHO DG, “Ultimate responsibility for the performance of a country’s health system lies with government.” Government remains the leverage point for health workforce development as well. Its role is to: set policy, secure financing for health services, support education and operate the public health sector with complying with regulation of the private sector.

Innovative approaches to public health development must be considered, with state of the art teaching materials and continuing education through the creative use of information and communications technology. Diverse national circumstances mean that solutions must be crafted to unique country challenges. Successful strategies should be country based and country led, focusing on the control of migration is important, as illustrated by the 59th

World Health Assembly call to countries to address migration of health personnel from developing countries.

Education for managing the health workforce for better performance should bring together the health and educational sectors in strategic partnership to achieve three core objectives: coverage, motivation and competence. Coverage strategies promote numeric adequacy, appropriate skill mixes and outreach to vulnerable populations. Motivation strategies focus on adequate remuneration, a positive work environment, opportunities for career development and supportive health systems. Competencies are advanced through educating for appropriate attitudes and skills, creating conditions for continuous learning, and cultivating leadership, entrepreneurship and innovation. All these efforts should be oriented toward building national capacity in the public health sector. Good data and effective operational research and program evaluations, invariably scarce, are needed most.

They are essential to inform policy makers and senior managers and to guide much needed effort to develop an effective health system that can assure the health of populations.

These challenges, while daunting, should be addressed with the highest priority. The lofty goal of better public health is a global challenge, but one that is addressable with 'healthy' health care systems. These must include public health promotion activities by underpinning adequate numbers and an adequate mix of clinical professionals, public health professional, middle level of health worker and community health workers with the partnership approach with community people and other stakeholder. Every public health system a long term view is required, with the aim of achieving slow, incremental change; it is the long term sustainable "bang for the buck" that should be valued over the short term but bigger "bang". Cost effectiveness assessments need to include a measure that reflects long term sustainability of public health.

## ORIGINAL ARTICLE

## Impact of Community Based Integrated Management of Childhood Illness Program on Behavior Change of Mothers towards Acute Respiratory Infection in Urban Ethnic Community of Eastern Nepal.

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### ABSTRACT

**Background:** The Ministry of Health and Population, Nepal recognizes Acute Respiratory Infection (ARI) as one of the major public health problems in Nepal among children <5 years of age. Community Based Integrated Management of Childhood Illness (CB-IMCI) is an integrated package of child-survival programs and addresses major killer diseases like pneumonia, diarrhea, malaria, measles, malnutrition in under 5 years children. Female Community Health Volunteers (FCHVs) are true volunteers that have become the vital link between the community and Nepal Government's healthcare system.

**Methods:** Cross sectional study had been carried out. Morang and Sunsari districts were selected purposively due to comprise of three-fourth Urawn inhabitants. Sample sizes were allocated for both selected districts as per sharing percentage of total population. Five Village Development Committees (VDCs) from each district were selected purposively for sample by probability proportion to size and then sample size was allocated accordingly by sharing a percentage of the population. Respondents were selected by snowball sampling technique. *Urawn* women having children less than 7 years of age were taken as the target population with sample size 401.

**Result:** Among total enrolled respondents mean  $\pm$  SD age of the respondents was  $28.90 \pm 4.46$  years. After implementation of CBIMCI, 99.5% observed change in behaviors of mothers. All most all mothers (99.7%) sought help for their sick children in earlier stage. For prevention from ARI, about half of the mothers had taken help from FCHVs, which was significantly increased after the implementation of CBIMCI ( $p < 0.001$ ). The percentage of mothers who had provided a warm fluid and breast milk to their children for the prevention of ARI was also significantly increased ( $p < 0.001$ ) after implementation of the program. Mothers' behaviors on health seeking behavior for their children with ARI as seeking help from FCHV and from health institutions were also significantly increased after the implementation of CBIMCI program.

**Conclusions:** Findings of the study showed the positive impact of CBIMCI on the mothers' behaviors of *Urawn* community in reference to ARI

**Key words:** Acute Respiratory Infection, Community Based Integrated Management, Childhood Illness

### INTRODUCTION

Pneumonia kills more children than any other illness. Around 156 million cases of childhood pneumonia occur each year, a majority of them in low and middle income countries (LMIC),<sup>[1, 2]</sup> An estimated 98% of children who die from pneumonia live in

LMIC.<sup>[3]</sup> One child dies from pneumonia every 20 seconds, adding up to 4,300 young lives lost every

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day<sup>[2]</sup>. It is estimated that more than 150 million episodes of pneumonia occur every year among children under five in the developing countries, accounting for more than 95 per cent of all new cases worldwide.<sup>[4]</sup> Nepal recorded high under-five mortality averaging about 170 annual deaths per 1000 in the early 1980s, and now reports 61 per 1000.<sup>[5,6]</sup> CB-IMCI is an integrated package of child-survival programs and addresses major killer diseases like pneumonia, diarrhoea, malaria, measles, malnutrition in under 5 year children.<sup>[1]</sup> CB-IMCI is an integrated approach to managing childhood illness at the community level. Female Community Health Volunteers (FCHVs) are true volunteers who are selected by the community people and that have become the vital link between the community and the Government health care system in Nepal. Hence this study was conducted to identify the impact of the CBIMCI program on behavior of mothers in the Urawn ethnic community towards ARI.

## MATERIALS AND METHODS

Community based cross sectional study was conducted in 10 selected VDCs (5 VDCs of each district) of Sunsari and Morang Districts, Nepal during March to August 2013. Morang and Sunsari districts were selected because those districts contain 75% of Urawn's habitants. Sample size for each district divided as per sharing percentage of total population and later stage 5 VDCs from each district selected purposively for sample by probability proportion to size using Microsoft Office Excel. The sample size of each VDC was allocated as per sharing percentage of the total population of all selected VDCs of respected districts. During the respondent selection, the purposive random selection process was applied. In that approach, all mothers who have children of less than or equal to seven years were taken as a sample. The first respondent was selected with the help of FCHV of that particular VDC and then the sample process was run by applying the snowball sampling method till the required sample of that particular VDC were not fulfill. Structured and semi structured type of questionnaire was used for data collection. The significance level was observed with

95% confidence level ( $p \leq 0.05$  for significant). Descriptive and inferential analyses were done with the sample size 401. Data was analyzed through the Statistical Package for Social Sciences (SPSS) version 16.

## RESULTS

The mean  $\pm$  SD age of the respondents was  $28.90 \pm 4.46$  years. Among total respondents, about 83% were Illiterate. About 4/5th of the respondents worship Nature and said differs from the Hindu religion, 17.2% were Hindu and 2.5% were Christian. Most of the households had multiple income sources viz. 77.8% daily wages, 63.3% labor work, 49.9% agriculture and so on (multiple answers). About 41% of

**Table 1: Socio-demographic characteristics**

Characteristic	Frequencies	Percentage
<b>Age distribution of the respondents (n=401)</b>		
20-24	51	12.7
25-29	222	55.3
30-34	74	18.4
35-39	45	11.2
40-44	7	1.7
45-49	2	0.4
<b>Mean age <math>\pm</math> standard deviation = 28.90 <math>\pm</math> 4.46 years</b>		
<b>Education Level of respondents</b>		
Illiterate	332	82.8
Primary,	5	8.7
Lower Secondary and above,	34	8.5
<b>Religion</b>		
Nature	332	80.3
Hindu	69	17.2
Christian	10	2.5
<b>Source of family Income *</b>		
Agriculture,	200	49.9
Daily wages,	312	77.8
Labor,	254	63.3
Other,	44	11
<b>Sufficient family income for survival throughout year</b>		
Yes	237	59
No	164	41
<b>Type of Cooking stove</b>		
General firewood stove	395	98.5
Smokeless	3	0.7
Gas stove	3	0.7
<b>Stagnation of smoke in kitchen</b>		
Yes	104	25.9
No	297	74.1



family members had no sufficient family income for their survival throughout year. The result of observation showed that, most (98.5%) households had general traditional stove made of clay where they use biomass (firewood, cow-dung, etc.) for cooking purposes and about 1/4<sup>th</sup> (25.9%) of total households had stagnation of smoke in the kitchen (Table 1) where 38.5% (40) mothers take their children with them during cooking time. About half of the family members live with smokers. All children had been fed Vitamin A from FCHV during the vitamin a campaign and immunized against the major killer

reported that they had observed changing of behaviors of mothers in the community after the implementation of the program. Among them, 99.7% (398) said that women of their respective village took their children for seeking help in the early stages of the illness. Likewise, 7.3% (29) of them said that mothers left to go to the Traditional Healers. ( Table 2)

Though all most all seek help while ARI, only about 38% (153) of them visited to FCHV and 98.8% of the rest (248) replied the reason of not going to FCHV was no idea about the medicine for ARI that FCHV could provide. (Table 2)

**Table 2: behavior related characteristics**

Characteristics	Frequencies	Percentage
<b>Smoking habit of household members</b>		
Yes	193	48.1
No	208	51.9
<b>Children with mothers during cooking in kitchen with stagnated smoke (n=104)</b>		
Yes	40	38.5
No	64	61.5
<b>Children immunized with Vitamin A</b>		
Yes	401	100
<b>Vaccines</b>		
Yes	401	100
<b>Change behavior observed in mothers after implementation of CBIMCI</b>		
Yes	399	99.5
No	2	0.5
<b>Change in different behaviors observed in mothers at community level while sick* (n=399)</b>		
Take children earlier for help when get sick	398	99.7
Left to go to the Traditional healers	29	7.3
Goes to FCHV	54	13.5
Goes to HW or Health Institution	112	28.1
Goes to Medical shops	347	87.7
<b>Seek help by mothers while their children got ARI from</b>		
FCHV	153	38.1
Others	248	61.9
<b>Reason for not seeking help from FCHV (n=248)</b>		
No good behaves	1	0.4
Far distance	2	1.2
No idea about medicine that FCHV could provide	245	98.8

After CBIMCI program, trend of seeking help from FCHV and health institutions by mothers found increased by 37% and 60% respectively. Statistically, by applying paired t test, there were After implementation of CBIMCI, ARI prevention activities and seeking help from FCHV/ Health worker was increased by 48.4% (3.5% to 51.9%), feeding breast milk by mothers to their babies was increased by 27.2% (60.1% to 87.3%), and giving adequate warm fluid by 2.7% (97.3 to 100%) seeking help from FCHV/HW immediately was increased by 48.4% (3.5% to 51.9%). In statistical pair t test all were found significantly increased after implementation of CBIMCI (p<0.01). Furthermore, it was found the interesting result that almost all mothers were preventing their children from cold, smoke and dust, seeking help from the traditional healers and giving adequate warm water from the beginning. (Table 3).

Along with other positive behaviors for prevention, due to strong beliefs with Traditional Healers, almost all mothers were found continually visiting the Traditional healers too (P<0.01) In this study with respect to educational level and health seeking behavior on RI, there is found no significant difference. (Table 4)

diseases from the indicated immunization centers. (Table 2). All most all 399 (99.5%) of respondents

**Table 3: Change behaviors before and after the program implementation**

Characteristics	Findings		P value
	Before	After	
<b>Health seeking behavior for children with ARI (Multiple response)</b>			
Home treatment	398 (99.3%)	399 (99.5%)	0.398
Traditional Healers	396 (98.8%)	397 (99.0%)	0.564
FCHV	4 (1.0%)	156 (38.9%)	0.001
Medical Shop	390 (97.3%)	391 (97.5%)	0.763
Health Institution	41(10.2%)	278 (69.3%)	0.001
Other	4 (0.3%)	5 (1.2%)	0.739
<b>Activities for prevention from ARI (Multiple response)</b>			
Prevent from cold, smoke and dust	393 (98%)	398 (99.3%)	0.059
Give adequate warm fluid	390 (97.3%)	401 (100%)	0.004
Give plenty of mother's milk	241 (60.1%)	350 (87.3%)	0.001
Seek help from FCHV/ Health worker immediately	14 (3.5%)	208 (51.9%)	0.001
Seek help from Traditional healer	382 (95.3%)	396 (98.8%)	0.004
Others	4(1%)	2 (0.5%)	0.415

**Table 4: Education Vs Health care visit**

Educational level	Health care visit	
	Yes	No
Illiterate	332 (100%)	0
Primary	34 (97.1%)	1 (2.9%)
Lower Secondary and above	34 (100%)	0

## DISCUSSION

The results show that the CBIMCI program has changed in ARI related behaviors of the mothers in the Urawn ethnic community.

Though several studies on Impact of training of CBIMCI and Impact of CBIMCI on health workers in different part of the world have been conducted, relevant other studies as impact on behaviors in reference to ARI at community people have not found more. Therefore, not all findings in this study has compared with other studies. In this study, respondents' observation revealed that almost all (99.7%) women of Urawn community started to seek help in earlier stage of disease and 7.3% of respondents said that there was decreased the trend to go to the Traditional Healers to seek help. This study showed that all children received vitamin A and vaccines. A study conducted in Nairobi, Kenya, showed that health care was sought outside the

home for 60.5% of the sick. Private clinics and drug shops/chemists were the most popular destinations for child health care seeking; second most popular were clinics run by faith-based institutions. Public clinics and hospitals are not primary sites for health care seeking because they are mostly found outside these communities.<sup>[7]</sup> In the two weeks preceding survey in Nepal in 2006, it was found that among the children suffered from ARI 3.2% and 0.7% seek treatment from FCHVs and traditional healers respectively.<sup>[8]</sup> A study conducted in Nairobi, Mothers belonging to the Kamba ethnic group (69.0%) took their sick children to health facilities more often than Luo (55.2%), Kikuyu (55.9%) and Luhya mothers (61.7%).<sup>7</sup> In this study, mothers seek help from multiple sources, even after the implementation of CBIMCI, as 99.5% did home treatment, 99% seek help from Traditional healer, 38.9% mother seek help from FCHV, 97.5% from Medical shop, 69.3% from health Institutions and 1.2% from other means. Almost all mothers visited to Traditional Healers due to their strong belief. (Table 4). Statistically, by applying paired t test, there were significantly changes found in seeking help from FCHV ( $p < 0.01$ ) and from health Institution ( $p < 0.01$ ) after implementation of CBIMCI. But no changes were found in seeking help from Traditional healers ( $p > 0.05$ ) and from medical shops ( $p > 0.05$ ) even after implementation of the program.

In a study conducted in Nairobi, Kenya Mothers aged 35 years and older (43%) were less likely to take their sick children for health care than younger mothers (63%) (OR  $\frac{1}{4}$  0.44; 95% CI: 0.25–0.78;  $P < 0.01$ ). About 59% of mothers with a primary education or less (434 of 732) took their sick children for health care, compared with 64.1% (161 of 251) of those with at least a secondary education ( $P > 0.05$ ).<sup>7</sup> In this study, 69.3% of mothers from the Urawn ethnic community took their sick children to health facilities. In this study almost all aged mothers provide homecare and care from outside home of any kinds. Most of the mothers prefer home treatment, treatment with traditional healers, Medical shops, health institutions, and FCHVs simultaneously. In this study education level of mothers and behavior in taking their children for a health care visit while sick has found no any major difference.

Awareness on home management is appropriate and is in conformity with family and community practices that promote child survival and development stipulated by the household and community components of IMCI.<sup>[9]</sup> A study conducted in Tanzania, showed that the practice of offering fluids and breastfeeding of sick children was low.<sup>[10]</sup> In this study all mothers were given adequate warm fluid and 87.3% mothers were giving breast milk.

## CONCLUSION

In this study, almost all mothers had observed changing behaviors of mothers for seeking help in an earlier stage of illness after implementation of the CBIMCI program. Flow of mothers towards FCHV and Health Institutions to seek help for their children while get sick was also significantly increased after the program Implementation. Different preventive activities as seeking help from FCHVs and Health Institutions earlier, feeding plenty of breast milk, giving an adequate warm fluid etc. were also significantly increased. It was found that after implementation of CBIMCI, almost all mothers fed vitamin A and immunized to their children against major killer diseases. Mothers had developed their knowledge and skill in proper care of children suffering from ARI at the community level, which were directed towards the proper management of childhood

illnesses as addressed by CBIMCI strategy. Therefore, implementation of IMCI programs showed positive impact on Urban communities in reference to ARI.

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## ORIGINAL ARTICLE

## Health Hazards due to Pesticide Use and Its Protective/Preventive Practice among Vegetable Farmers in Bhaktapur District of Nepal

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### ABSTRACT

**Background:** Pesticides are widely used throughout the world, especially in agriculture for crop protection. They have indisputably created minor to severe health hazards and developing as a major public health problem worldwide. Farmers use pesticides without full understanding of the impact on human health and the environment. This study was conducted to identify the health hazards and protective practice during pesticide use among vegetable farmers in Bhaktapur district of Nepal.

**Method:** Descriptive cross sectional study was carried out among 138 vegetable farmers in randomly selected two service centers of Bhaktapur district during May to June 2010. The sample size was calculated by using the statistical formula considering 8.0 % absolute error and 95% CI level. Proportion based stratified random sampling technique was applied to select the sample. Data were collected by interview technique using pretested structured questionnaire. Collected data were analyzed in SPSS version 13.0 using descriptive statistics. The analyzed data were disseminated in tables, graphs/charts and narrative description as per necessity.

**Result:** Out of 138 participants, about 46.4% were found to be felt their health being affected by pesticide use. One fifth of the respondents who felt any kind of health hazards including eye irritation, short breathlessness, headache, skin problems and frequent headache and more than one-quarter (26.6%) have seen skin problems due to pesticides. About 82.6% have experienced pesticide spillage in their body part and 57% used to wash exposed body part with soap water and 15.2 % took bath after using pesticides. Most of the participants (79.9%) were found to be wearied of separate cloths during pesticide use followed by mask (50.7%), gloves (48.6%) and safety boot 42.0%. Only 18.1% found to be follow safety technique of mixing pesticide. Most of the pesticide users didn't eat, drink or smoke while dealing with pesticides. About 39% of the participants were found to follow the written instruction before using the pesticide. One-quarter; (24.6%) participants stored the pesticides in safe place. About 70.3% were found to be disposed it unsafely. Only 18.1% of the total vegetable growers were trained in safe handling of pesticides.

**Conclusion:** Nearly half of the respondents were found to be felt their health being affected by pesticide use. One fifth of them have been observed multiple symptoms. Protective practice was found to be very poor and nearly one fifth of the participants were trained. Awareness on impact of pesticides in health and protective measures should be created among the vegetable farmers through training and other appropriate techniques.

**Keywords:** Pesticides use, health hazards, protective practice, vegetable farmers, Bhaktapur district

Agriculture work is one of the most prevalent types of employment in the world. Pesticides are widely used throughout the world, especially in agriculture for crop protection. According to the World Health Organization (WHO), 20% of pesticide use in the world is focused on developing countries including Nepal. Many indicators showed that pesticide use has been increasing at an alarming rate in agricultural sector. They have indisputably created minor to severe health hazards and developing as a major

public health problem worldwide. About 1-5 million farm workers are estimated to suffer pesticide poisoning every year and at least 20,000 die from the exposure, many of them in the developing world. <sup>[1]</sup> Nearly 50 percent of the world labor is employed in

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agriculture and they carry significant risk for development of pesticide health hazards. [2] Nepal has an amazing opportunity for producing vegetables as diverse agro-eco-zone favors both season and off-season varieties. Due to this advantage farmers are encouraged to produce vegetables to fulfill the national and international demand. Thus, production and productivity of vegetables have been increasing significantly in the last decade. [3] Farmers use pesticides without full understanding of the impact on human health and the environment. They also lack the appropriate knowledge on safe handling and use of pesticides. [4, 5] Human come into contact with pesticides in the field, during pesticide application, weeding, harvesting, and when collecting firewood or vegetables; or in their homes when pesticides are used to kill mosquitoes, cockroaches, and flies. Storing pesticides may lead to exposure and adverse health consequences. Although inhalation, contact, and oral routes of exposure are most common, pesticide residues in food and water may add to indirect exposure. Misusing pesticides also harm the natural environment as well as human health. [6]

Pesticide-related illness suffered by members of a household may affect the overall performance and the productivity of the farm family, as households normally supply agricultural labor in developing countries like Nepal. The use of pesticides on vegetable crops in Nepal has increased dramatically in recent years. Farm chemicals are used intensively in the Terai region and in Kathmandu valley and its surrounding areas such as Bhaktapur, Lalitpur, Kavre and Dhading districts where agriculture; specially vegetable production is significantly commercialized. [7] This study was conducted to identify the health hazards and protective practice during pesticide use among vegetable farmers in Bhaktapur district of Nepal.

## **MATERIALS AND METHODS**

A Descriptive cross sectional study was carried out among vegetable farms in randomly selected two service centers (33.3% of total 6 service centers with total population 720) in Bhaktapur district. It is the smallest district of Nepal covering an area of 138.46 Square Kilometers. It lays 27° 36' to 27°

44' Northern Latitude and 85°21' to 85°32' Eastern Longitudes with bound ring by Kavreplanchowk, Kathmandu and Lalitpur, districts. Its geophysical area includes hilly and valley lands and is considered to be very much suitable for agriculture.

The study was conducted from May to June 2010. The sample size was calculated by using the proportion based statistical formula;  $n = \frac{z^2 p q N}{(Nd^2 + z^2 p q)}$  with considering 8 % absolute error and 95% confidence interval (CI) level. On the basis of 50 % proportionate level of health hazards the minimum sample size was 125. Adding 10 % attrition and non response rate, the final sample size was 138. Proportion based stratified random sampling technique was applied to select the sample from the selected service centers. The participants were briefed about the aim of study and verbal consent was taken before preceding the data collection. Privacy, anonymity and confidentiality were fully maintained throughout the whole process of study. Interview techniques were adapted to collect the information. Ten percent of the questionnaires were pretested to check the consistency, outliere and missing values before starting the final study. Data were checked and re checked and entered into the computer on the same day using statistical software SPSS version 13 and analysis was done using descriptive statistics. The analyzed data were disseminated in tables, graphs, charts and the narrative description as per necessity.

## **RESULTS**

### **Experience of health hazards of the respondent during pesticide use and their types:**

Out of 138 participants, about 46.4% were found to be felt, their health being affected by pesticide use; whereas 53.6 % did not get any experience of health hazards during the pesticide use.

### **Experience of pesticide spilling**

As many as four fifth (82.6%) of the vegetable farmers have experienced pesticide spillage in their body part. This clearly indicates that has been improper handling of pesticides during its application among the farmers and they are being more exposed

to the toxic pesticides. Most of the spoils have occurred in the hands (66.7%) followed by feet (32.5%). Direct contact with the eye is not quite common; (Table: 1).

After spilling of pesticides in the body parts, most of the farmers (57%) wash that body part with soap and water, 2.2% consult with medical personnel and 9.6% do not bother to do anything for the spillage.

**Table 1: Health hazards observed due to pesticides**

Symptoms or Hazards		Freq.	Percent
<b>Experience of health hazard (n=138)</b>	Yes	64	46.4
	No	74	53.6
<b>Types of health hazards observed due to pesticides (n= 64)</b>	Eye irritation	6	9.3
	Headache	13	20.3
	Skin problems	17	26.6
	Short breathlessness	3	4.7
	Poisoning	8	12.7
	Cancer	4	6.2
	Multiple answers	13	20.3
<b>Experience of pesticide spill (n=138)</b>	Yes	114	82.6
	No	24	17.4
<b>Experience of spill in body parts (n=114)</b>	Hand	76	66.7
	Feet	37	32.5
	Eyes	1	0.9

**Protective practice during and after using pesticides**

Most of the participants (79.9%) were found to be wearied of separate cloths during pesticide use. About half (50.7%) of the participants reported that they used masks as a protective equipment followed by 48.6% gloves, 42.0% safety boot, 23.0% head cover and 10.1% eye glass during the work. While mixing pesticide solution, 33.3% use their bare hand and 32.6% use stick though using bare hand. Only 18.1 practice safe techniques of mixing pesticide by using sticks and gloves in their hands. Most of the pesticide users didn't eat, drink or smoke while dealing with pesticides. But while we compare, drinking

water is seen to be more common (14.5%) during pesticide use followed by smoking cigarettes (10.1%). Nearly two-fifth (39%) of the participants were found to be using the pesticide by following the instruction given in the packet and remaining of other used either following the instruction given by the

**Table 2: Protective and preventive behavior during and after dealing pesticide**

Protective practice		Freq.	Percent
<b>Using of Face mask (n=138)</b>	Yes	70	50.7
	No	68	49.3
<b>Wearing of eye glass (n=138)</b>	Yes	14	10.1
	No	1124	89.9
<b>Using of Hand gloves (n=138)</b>	Yes	67	48.6
	No	68	49.3
<b>Wears of separate cloths during work</b>	Yes	111	79.9
	No	27	20.1
<b>Wears of special shoes</b>	Yes	58	42.0
	No	80	58.0
<b>Wears on head cover</b>	Yes	32	23.0
	No	106	77.0
<b>Following safety procedure mixing pesticide</b>	Yes (stick and gloves)	25	18.1
	No (bare hand)	113	81.9
<b>Eat during application</b>	Yes	10	7.25
	No	128	92.75
<b>Smoke during application</b>	Yes	14	10.1
	No	124	89.9
<b>Drink during the application</b>	Yes	20	14.5
	No	118	85.5
<b>Washing and bathing practice after pesticide use</b>	Yes	128	96.4
	No	10	3.6
<b>See the level before application</b>	Yes	54	39.0
	No	84	61.0

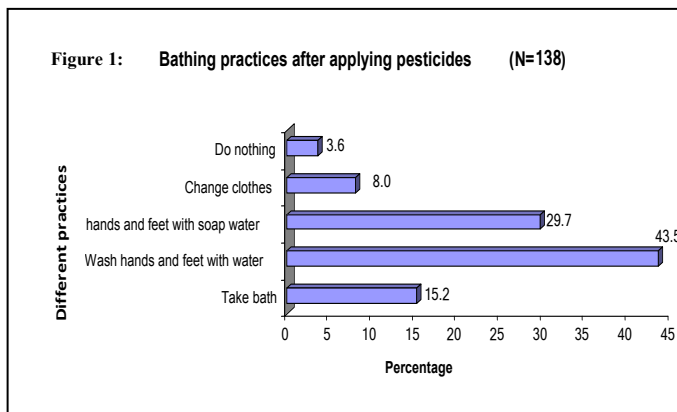
shopkeeper or elderly people; (Table:2). Vegetable growers, after applying pesticides

should necessarily take a bath with soap and clean water. But most of the farmers in Bhaktapur district



seem to be very careless regarding it. Just more than two-fifth (43.5%) of them wash their hands and feet with general water only followed by soap-water (29.7%).

One fifth of the respondents who felt any kind of health hazards had observed multiple symptoms, including eye irritation, short breathlessness, headache, skin problems, etc. Another one fifth reported



that they have frequent headaches and a majority (26.6%) have seen skin problems due to pesticides. (Table: 1). Only 15.2 % have taken a bath and 3-6% do nothing at all. (Figure: 1)

**Table 3: Storage and disposal practice of pesticide bottles/packets**

Characteristics		Freq.	Percent
<b>Storage Practice</b>	Anywhere	15	10.9
	Safe place where children do not reach	34	24.6
	Kitchen	19	13.8
<b>Disposal of pesticide bottle/packets</b>	In the field	70	50.7
	Burn	17	12.3
	Bury	24	17.4
	Dispose with other waste	97	70.3

**Storage and disposal of pesticide waste**

Storage of pesticides should be done in a locked area that is separate from food and other eatables including water. It should be kept away from children as well as pets. The study showed that half (50.7%) of the participants stored the pesticides in the field followed by safe place where children do not reach (24.6%), kitchen (13.8%) and anywhere

(10.9%). Pesticide should be disposed properly, otherwise the remaining residues can contaminate the environment and come first (I) contact with human through various mediums.

The majority of the vegetable growers (70.3%) found to be disposed it with other wastes, 17.4 % practice burying in the ground and 12.3% burns it. This clearly depicts that most of the pesticide users do not realize it to be toxic to both man and the environment and dispose it like other waste. (Table: 3)

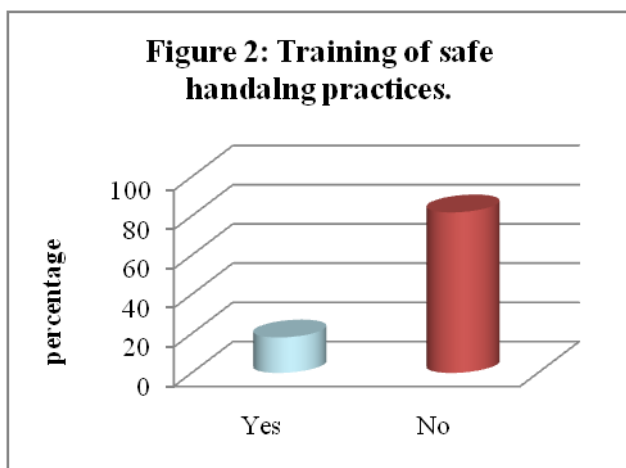
**Trainings regarding the safe handling of Pesticides**

Trainings not only incorporates knowledge, but also inculcates the skill for safe handling of dangerous substance like pesticides, but unfortunately only 18.1% of the total vegetable growers were found to be trained in safe handling of pesticides. Remaining 81.9% were untrained but were yet handling pesticides in day to day life.

**DISCUSSION**

Health hazard is increasing dramatically as a challenging public health problem in Nepal. Nearly half of the participants (46.4 percent) were found to be felt their health being affected by pesticide use which was strongly supported by a study finding conducted in Philippine.

he finding reported that three quarter (74.0 Percent) of the pesticide users became ill because of work for the last 12 months [8]. One fifth of the respondents in this study who felt any kind of health hazards had observed multiple symptoms, including eye irritation, short breathlessness, headache, skin problems, etc. This finding was also supported by other studies conducted in Nepal and abroad. Study of Philippine showed the most common symptoms; headache (64.1 percent), muscle pain (61.1 percent), cough (45.5 percent), weakness (42.4 percent), eye pain (39.9 percent), chest pain (37.4 percent), and eye redness (33.8 percent). [8] Similarly study from A study conducted in 3 contrasting sites of vegetable farms in Bangladesh revealed that 37 percent of the farmers, during spraying of pesticides, felt burning sensation,



28 percent had breathing problem, 18 percent felt itching, 13 percent felt dizziness and 11 percent felt burning in the eyes <sup>[9]</sup> Furthermore, a recent study conducted in Nepal and India showed that 31 percent of farmers complained of headache, 27 percent eye irritation, 24 percent skin burning, 10 percent nausea and 9 percent dizziness associated with plant protection sprayers. <sup>[10]</sup>

More than four fifth (82.6 percent) of the participants in this study were found to be experienced of pesticide spillage in their body part. This clearly indicates that has been improper handling of pesticides during its application among the farmers and they are being more exposed to the toxic pesticides. About two-third (66.7 percent) of the spills has occurred in hands followed by feet (32.5percent) which was in-line with the study reported from Philippine. <sup>[8]</sup>

Wearing of personal protective equipment (PPE) is essential to prevent from health hazards of pesticide. Present study revealed that nearly three-fifth (57.9 percent ) of the participants have been used mask as a protective equipment followed by 21.7 percent eye glass, 18.1percent gloves and 57.9 percent separate uniforms during using the pesticide. This finding was less than study findings from Philippine which showed that 88.4 percent reported that they wore protective equipment while working. However, further analysis shows that they did not frequently use such equipment nor had adequate gear to fully protect them. One hundred forty two or 67 percent never used coveralls. The same pattern was seen among all kinds of personal protective equipment

(PPE) with the exception of boots which was frequently used by 77.5 percent of farmers; <sup>[8]</sup> but it was much better than the study finding reported from India and other parts of Nepal. That showed only the 20percent of the farmers took any kind of safety measures during application and preservation of pesticides. <sup>[10]</sup>

Many farmers do not care about the safe handling of pesticides. This study showed that only 18.1 percent were found to be practicing safe technique (using a stick and gloves in their hands) during mixing pesticide which was very poor practice than the study reported from the Dang district of Nepal. Studies have reported that more than 50 percent farmers used their bare hands while mixing pesticides. <sup>[3]</sup> Most of the pesticide users didn't eat, drink or smoke while dealing with pesticides. But while we compare, drinking water is seen to be more common (14.5 percent) during pesticide use followed by smoking cigarettes (10.1 percent); which is alike to the study findings reported from west bank Palestine. <sup>[3]</sup> Vegetable growers, after applying pesticides should necessarily take-thorough a bath with soap and clean water, but most of the farmers in this study seem to be very careless regarding it. Just more than two-fifth (43.5 percent) of them wash their hands and feet with general water only followed by soap-water (29.7 percent). Very few (15.2 percent) were taken bath which is essential after pesticide use.

The selection of pesticides, dosage, and mode of application is also an important task of pesticide users. Nearly two-fifth (39 percent) of the participants in this study were found to be using the pesticide by following the instruction given in the packet and remaining of other used either following the instruction given by the shock peeper or elderly people; which was somehow matched with the study reported by Rao et. al. <sup>[10]</sup> Furthermore, storage of pesticides should be done in a locked area that is separate from food and other eatables including water. It should be kept away from children as well as pets. Present study prevailed that half (50.7 percent) of the participants stored the pesticides in the field followed by safe place where children do not reach (24.6percent), Pesticide's bottle and

packets should be disposed properly, otherwise the remaining residues can contaminate the environment and come first (I) contact with human through various mediums. The majority of the vegetable growers (70.3 percent) found to be disposed it with other wastes, which is very poor practice. Only 17.4 percent were found to be practiced burying in the ground and 12.3 percent burns it. This clearly depicts that most of the pesticide users do not realize it to be toxic to both man and the environment and dispose it like other waste. The study finding was more or less similar to the study finding of other similar studies. <sup>[3, 11]</sup>

Trainings are an essential mode of improving knowledge and enhancing proper skill on safe handling, storage, disposal and application of pesticides. Unfortunately, in this study only 18.1 percent of the total participants were found to be trained in safe handling of pesticides which is supported by a study conducted in Dhading district of Nepal and Palestine. <sup>[11]</sup> The finding showed that majority of vegetable growers (93.3 percent) in Dhading district did not receive any kind of training at all on the use of pesticides.

## CONCLUSION

Nearly half of the respondents were found to be felt, their health being affected by pesticide use. One fifth of them had observed multiple symptoms, including eye irritation, short breathlessness, headache, skin problems, etc. More than two-third of the participants were used separate uniform for protection while, nearly three-quarter disposed the pesticide bottle/pocket unsafely. Nearly one fifth of the participants found to be trained. Awareness of the impact of pesticides on health and protective measures should be created among the vegetable farmers through training and other appropriate techniques.

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## ORIGINAL ARTICLE

## Newborn Care Practices among Mothers in Rautahat District, Nepal

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## ABSTRACT

**Background:** Newborn health care starts before the birth of the baby and continues till the baby is of 28 days. Most of the newborn deaths occur in the first week of life, that's why Child health is addressed in UN Millennium development goal-4 report, to reduce the under 5 years child death by two third by reducing the New born death by 2015. The study aimed to assess newborn care practices among mothers in Rautahat district, Nepal, determines it relationship with the level of education among mothers.

**Materials and Method:** An analytical cross-sectional study was carried out in Rautahat District of Nepal in 2012 among 101 married women of reproductive age group having less than one year children. The quantitative data was collected using Cluster sampling technique through structured interview questionnaire. Data analysis and processing were done in Ms-excel datasheet, and SPSS 16.0. Chi-square test was run in order to determine the relationship between dependent & independent variable.

**Results:** The median age of the respondent was found to be **18 years**. There were non-significant associations between education and ANC. There was statistical significance found between place of delivery and education status, delivery conducted by whom and education status.

**Conclusion:** New born care practice in Rautahat district doesn't seem to be satisfactory due to early marriage practice. The study suggests the women's empowerment and education as well as stopping the practice of early marriage to improve the practice of new born care.

**Keywords:** Antenatal care, Post natal care, new born care practice, place of delivery

## INTRODUCTION

Newborn health care starts before the birth of the baby and continues till the baby is of 28 days. It starts with caring for pregnant mothers by addressing her needs to be adequately nourished, infections prevention, and monitored for complications. Adequate access to preventive measures, treatment when needed, and health counseling/ advice, including education about danger signs helps the mother to reduce the complications and give birth of a healthy baby. Good care during pregnancy, labour, and birth is the first step in good newborn care. Post natal care is the next step which helps in fulfilling the requirements after birth. It mainly focuses over the requirements of the Newborn and

post partum mother health regarding: keeping the baby warm, protection from infection, exclusive breastfeeding. Mothers postpartum care, give first immunizations if the baby has not received them, reviewing new born danger signs.<sup>[1]</sup>

The first 28 days of life is known as the newborn or neonatal period. It is the most complicated period in the life of an individual. Out of every 100 children born alive, about 10 die before reaching the age of 5 years. Of these 10, about 4 die in the first month of

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life, the new born period. Most of these newborn deaths occur in the first week of life, that's why Child health is addressed in UN Millennium development goal-4 report, to reduce the under 5 years child death by two third by reducing the New born death by 2015.<sup>[2]</sup>

Globally 10 million children die annually before their fifth birthday, most of them in the neonatal period.<sup>[3][9]</sup> More than 98% of these deaths occur in developing countries. Almost half of the deaths occur in fewer than five year olds occur in infancy. Of the infants deaths, about two thirds occur in the neonatal period. It has also been noted that one third of all neonatal deaths occur on the first day of life, almost half within 3 days and nearly three quarters within the first week of life.<sup>[4]</sup> In Nepal, the neonatal death rate has not been reduced from 33/1000 since 2006-2011. (NDHS report 2006 & 2011).<sup>[5][6]</sup>

Clean delivery- including clean hands, clean delivery surface, clean cord cutting and tying, proper cord care, and bathing- is a key intervention for reducing infections in newborns.<sup>[7]</sup> The ideal situation for newborn is to admit every ill newborn baby to hospital but hospitals with facilities for newborn care are inaccessible for rural populations. The study aimed to assess newborn care practices among mothers of Rautahat district as well study is specified with the aim to assess several practices involved in newborn care, identify socio demographic factors affecting newborn care practice and to determine level of knowledge among mothers regarding newborn care.

## **MATERIALS AND METHODS**

An analytical cross-sectional study was carried out in Rautahat District of Nepal in 2012 among 101 married women of reproductive age group having less than one year children. Quantitative data was collected using clustered sampling (using probability proportionate). The study duration was from 27<sup>th</sup> July to December, 2012. Rautahat district was selected purposively due to different ethnic groups, with the highest rate maternal deaths among Muslims (318/100000 live births, Terai/Madhese

307/100000 live births and Dalit 273/100000 live births).[5] In rural area 3 VDCs were selected as a cluster using probability proportionate to size and the findings are illustrated on the basis of role of education.

Structured interview schedule consisting the information such including code number and other socio demographic variables such as age, gender, caste, religion, educational status, occupation, marital status, family composition, income level of participants and questions related to care given during pregnancy and newborn. The structured questionnaire was obtained from NDHS report 2006, Maternal Mortality and Morbidity study, Family Health division 1998, Teku, Nepal report.

Data analysis and processing were done in Ms-excel, and datasheet SPSS version 16.0. Chi-square test was done to measure the relationship dependent and independent variables at 95% Confidence interval. Level of significant was set at the value of  $p < 0.05$ .

Ethical approval was obtained from ethical board of Nobel College as well as verbal informed consent was taken from each respondent before data collection.

## **RESULTS**

### **Socio-demographic findings**

The median age of the respondent was 18 years. 61% of the respondents were of 15-19 years age group. 10% of the respondents were of ,15 years age group. 23% of the respondents were of 20-24 years age group. Only 6% of the respondents were of 25-29 years of age group. Majority of the respondents (69%) were Hindu followed by 23% Muslim. Similarly, 48% of the household has per month income of Rs. 5000-10000 and very few about 6% of the respondent's household has per month income of Rs.>25000.

The study showed that almost half 49.6% of the respondents were illiterate (unable to read and write themselves) whereas 21.7% of the respondents were literate (able to read and write simple words).

**Table 1: Demographic Characteristics of Respondents (n=101)**

Variables	Frequency	Percent
<b>Age of the Respondent (in year)</b>		
<15	10	10.0
15-19	62	61.0
20-24	23	23.0
25-29	6	6.0
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Religion</b>		
Hindu	70	69.0
Muslim	23	23.0
Buddhist	7	7.0
Christian	1	1.0
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Household Income</b>		
2000-5000	14	14.0
5000-10000	49	48.0
10000-15000	26	26.0
15000-25000	6	6.0
>25000	6	6.0
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Education Status</b>		
Illiterate	50	49.0
Literate	22	22.0
Primary level	9	9.0
Lower secondary level	6	6.0
Secondary level	6	6.0
Higher secondary level	7	7.0
Higher studies	1	1.0
<b>Total</b>	<b>101</b>	<b>100.0</b>

Similarly, 8.8% of the respondents were of primary level, 6% respondents were of lower secondary and secondary level, about 7% of the respondents were of higher secondary level and very few about 1% of the respondents had done higher studies.

**Table 2: Role of education in Maternal and Newborn care practices**

Categories	Literate		Illiterate		P value
	N	%	N	%	
<b>ANC visit during pregnancy (n=101)</b>					
Yes	47	46.5	48	47.5	0.201*
No	4	4	2	2	
<b>Place of Delivery</b>					
Home	17	16.8	48	47.5	0.001
Health Institution	34	33.7	5	5	
<b>Delivery conducted by</b>					
Technical (Doctor, Nurse and Paramedics)	30	29.7	10	10.6	0.002
Non Technical (MCHW/TBA and others)	21	20.7	40	39.6	
<b>Use of clean home delivery kit (n=62)</b>					
Yes	11	17.7	20	32.6	0.527
No	6	9.7	25	40	
<b>Instrument used for cord cutting (n=62)</b>					
New blade	16	25.8	34	54.8	0.231*
Knife, Scissors and others	1	1.6	11	17.8	
<b>Application of something after cord cutting (n=62)</b>					
Yes	4	6.4	7	11.3	0.448*
No	13	21	38	61.3	
<b>Bathing of baby after birth</b>					
Within 24 hrs	7	6.8	9	8.8	0.920
After 24 hrs	44	43.5	41	40.6	
<b>Colostrums feeding</b>					
Yes	27	26.7	19	18.8	0.498
No	24	23.7	31	30.7	
<b>PNC visit</b>					
Yes	21	20.8	18	17.8	0.450
No	30	29.7	32	31.7	

\*Yets corrected Chi square test

ANC visit during pregnancy: The study showed that 46.5% of the literate and 47.5% of the illiterate respondents had gone for ANC visit. Hence, there is no statistical significance found between ANC visit and educational status of the respondents. (p=0.201)

Place of Delivery: There is statistical significance between place of delivery and educational status. It represents that 16.8% of the literate and 44.5% of the illiterate respondent had home delivery. 33.7% of the literate and 5% of the illiterate respondent had delivered their baby at health institution. (p=0.001)

Delivery conducted by: There is statistical significance between delivery conducted by and educational status. It represents that 1.96% of the literate respondent delivery was conducted by doctor. 21.8% of the literate and 7.92% of the illiterate respondents had conducted their delivery by nurse (p=0.002).

Use of clean home delivery kit (n=62): There is no statistical significance between use of clean home delivery kit and education status. It represents that 17.7% of the literate and 32.6% of the illiterate respondent had used clean home delivery kit. Similarly 9.7% of the literate and 40% illiterate respondents had not used clean home delivery kit for deliveries conducted at home. (p= 0.527)

Instrument used for cord cutting (n=62): The study shows that 25.8% of the literate and 54.8% of the illiterate respondent had used new blade for cord cutting whereas 1.6% of the literate and 12.9% of the illiterate respondent had used old blade for cord cutting. Similarly 3.2% of the literate respondent had used knife for cord cutting and 1% of the illiterate respondent had used scissors for cord cutting. (p=0.231). It shows that there is no significant relationship between instrument used for cord cutting and education status.

Application of something after cord cutting (n=62): There is no significant relationship between use of clean home delivery kit and education status. It represents that 6.4% of the literate and 11.3% of the illiterate respondent had applied of something after

cord cutting. Similarly, 21% of the literate and 61.3% of the illiterate respondents had not applied anything after cord cutting for delivers conducted at home. (p=0.448)

Bathing of baby after birth: The study revealed that there is no statistical significance between bathing of baby after birth and education status. It represents that 3.9% of the literate and 4% illiterate respondents had bathed their baby immediately within one hour whereas 2.9% of the literate and 4.9% of the illiterate respondents had bathed their baby within 2-24 hours. 43.5% literate and 40.6% illiterate had bathed their baby after 24 hour. (p=0.920)

Colostrums feeding: There is no statically significance between colostrums feeding and education status. The study results show that 26.7% of the literate and 18.8% of the illiterate respondents had feed colostrums to their baby immediately within one hour whereas 23.7% of the literate and 30.7% of the illiterate respondents had feed colostrums to their baby after one hour. (p=0.498)

Findings related to status of newborn care: The study shows that 58% of the babies were kept on the floor those who were delivered at home, 40% of the respondents had kept their baby with themselves and 1.62% baby were on the bed after birth at home.

According to the fact mentioned 82% of the respondents who had delivered (n=62) their baby at home had wrapped their baby with clean clothes immediately after the delivery. The responses on Kangaroo mother care practice (n=135) showed that 48% don't know about the Kangaroo mother care practices, of them who knows about it, 28% of them told that it means temperature maintenance of the baby body while 18% says that it means naked chest contact of the mother and baby, 6% of the respondents said that it means skin to skin contact and 5% of them told health care of the baby.

The immunization status shows that (n=101) most of the respondents (94.1%) had immunized their baby with BCG vaccine whereas maintenance of exclusive breast feeding status (n=58) shows that 54% of the respondent maintained exclusively breast feeding by



providing the breast milk as much as the baby could drink, 38% of the respondents maintained exclusively breast feeding by feeding the breast milk only and 8% of the respondent maintained exclusively breast feeding by breast feeding their baby times in day and night.

## DISCUSSION

In a descriptive study done by Nuzhat Choudhary et al, in the urban slum of Dhaka, Bangladesh, The baseline survey revealed that 25% of the recently delivered women received at least four antenatal care visits.<sup>[8]</sup> Total ANC coverage for the present study respondent was 94%.

In a cross sectional study done by Rahi M et al, in urban slum of Delhi more than half i.e 56.1% of deliveries were conducted in home. Among these deliveries 91.3% of the deliveries were conducted by dias, 8.7% of the home deliveries were conducted by relatives.<sup>[9]</sup> According to the present study 61.38% of the respondent had home delivery. 36% of the respondent delivery was conducted by untrained TBA. It represents that 17.7% of the literate and 32.6% of the illiterate respondent had used clean home delivery kit during their delivery.

In-depth interviews and focus group discussions study done by Lawn et al, in rural Northern Ghana, it reflects that cord are involved non-sterile materials and practices: Cord cutting was done with a variety of tools, and the most commonly used were razor blades or scissors and similar to this present study also revealed most of the respondent who has delivered baby in home had used new blade for cord cutting.<sup>[10]</sup> In a cross sectional retrospective study done by Mc Pc RA et al, Siraha district, Nepal. 92% respondent had bathed their baby within the first hour.<sup>[11]</sup> Whereas the present study shows there is no statistical significance between bathing the baby and education status of mother as only 3.9% of the respondent had bathed their baby immediately within one hour.

According to NDHS report 2011, 45% of women received postnatal care for their last birth within the critical first two days delivery.<sup>[5]</sup> In a descriptive

study done by Nuzhat Choudhary et al, in the urban slum of Dhaka, Bangladesh, The baseline survey revealed that 24% women received at least one post natal care visit.<sup>[8]</sup> Present study showed that 20.8% of the literate and 17.8% of the illiterate respondent went for PNC visit. (p=0.450)

Shreerama reddy C. T. et al (2006) Only 45.8% of the newborns were wrapped within 10 minutes and 97.1% were wrapped within 30 minutes.<sup>[12]</sup> According to the recent study by Vinod KP et al 82% of the respondents who had delivered their baby at home had wrapped their baby with clean clothes immediately after the delivery.<sup>[13]</sup>

A study on kangaroo care by Charpak et al., the intervention consists of continuous skin-to-skin contact between the mother and the infant, exclusive breast feeding, and early home discharge in the kangaroo position. In studies of the physiological effects of KMC, the results for most variables were within clinically acceptable ranges or the same as those for premature infants under other forms of care. Body temperature and weight gain are significantly increased, and a meta-analysis showed that the kangaroo position increases the uptake and duration of breastfeeding.<sup>[14]</sup> The present study represents that 48% don't know about the Kangaroo mother care practices, of them who knows about it, 28% of them told that it means temperature maintenance of the baby body while 18% says that it means naked chest contact of the mother and baby, 6% of the respondents said that it means skin to skin contact and 5% of them told health care of the baby.

A study conducted on, An maternal attitudes and trends in initiation of newborn in lady Hardinge Medical College, New Delhi, India by Kmari S et al, clearly concluded that better health education is called for regarding the early initiation of breast feeding and the importance of colostrums' to newborn weaning practices.<sup>[15]</sup> In the present study, 54% of the respondent maintained exclusively breast feeding by providing the breast milk as much as the baby could drink, 38% of the respondents maintained exclusively breast feeding by feeding the breast milk only and 8% of the respondent maintained exclusively breast feeding by breast feeding

their baby times in day and night.

## CONCLUSION

The median age of the respondent was 18 years. 61% of the respondents were of 15-19 years age group. Majority of the respondents (69%) were Hindu followed by 23% Muslim and had low income. The study showed that almost half 49.6% of the respondents were illiterate (unable to read and write themselves). Home delivery was preferred by the most of the respondent in Rautahat district. Similarly delivery was mostly conducted by untrained traditional birth attendance and colostrums feeding and kangaroo care were not so in practice. Regarding new born care practice in Rautahat district doesn't seemed to be satisfactory due to early marriage, low education of mothers, home delivery preferred, low coverage of PNC visit as well as lack of knowledge on better practices on newborn care.

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## ORIGINAL ARTICLE

**Duration of Stay for People Living with HIV/AIDS in Community Care Centre and its Correlates**Chiranjivi Adhikari<sup>1</sup>, Arjun Gyawali<sup>2</sup><sup>1</sup>Department of Public Health, School of Health & Allied Sciences, Pokhara University Kaski, Nepal. <sup>2</sup>Nava Kiran Plus, Community Care Centre, Tikapur**ABSTRACT**

Community Care Centre (CCC) supports the people living with HIV (PLHIV). The cost of lodging and food increases as the duration of stay increases. The purpose of the study was to assess the factors correlated and associated with duration of stay in the CCC. Secondary data of 62 PLHIV registered during Aug 8, 2012 to Jan 13, 2013 was taken for the study. CD4 count was found to be significantly inversely correlated ( $\rho = -0.37$ ,  $p=0.009$ ) with duration of stay in CCC even after the age adjusted ( $\rho = -0.28$ ,  $p=0.027$ ). Most married people were found to be lived for more than two weeks compared with single ( $\chi^2=4.36$ ,  $p=0.037$ ). The negative correlation concludes that PLHIV of lower CD4 count stayed for longer duration in CCC and the significant association of marital status with duration of stay concludes that married PLHIVs stayed for longer duration compared with single or unmarried, which might be due to discrimination at family and community level. Henceforth this is recommended for policy, however, further research is needed before reaching to a firm conclusion

**Key words:** *People living with HIV; community care; duration of staying, correlation; Nepal*

**INTRODUCTION**

Community Care Centre (CCC) provides the opportunities for people living with HIV (PLHIV) in the accommodation, nutrition, care and support, ART adherence and other psycho-social support including reducing stigma and discrimination. The guideline of the government of Nepal; CCC standardized operating procedures (SOPs) discusses the criteria for admission and duration of stay for PLHIV in CCC, however, the variation of CD4 count is not mentioned as a criterion.<sup>[1]</sup> The cost of lodging and food increases as the duration of stay increases. The demographic and other variables responsible for the duration of stay in the CCC were tested for association and correlation applying chi-square and correlation tests. The objective of the study was to assess the factors correlated and associated with duration of stay of PLHIV in CCC. Secondary data of 62 PLHIV (including five transferred in) registered in Nava Kiran Plus Community Care Centre, Tikapur, Kailali, Nepal from Aug 8, 2012 to

Jan 13, 2013 was taken for the study. The study will help in considering the factors for staying of PLHIV in CCC

**MATERIALS AND METHODS**

The community care center was established in Tikapur, Kailali, Nepal in July, 2012. Sixty two PLHIV were registered including two children under 14 years and five were transferred in from other CCC. Secondary data were analyzed for demographic variables (age, sex, occupation, place of residence and marital status) and clinical variables (OI prophylaxis status, past history of TB, current ART status, systolic and diastolic blood pressure,

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weight and CD4 count) with duration of stay in the CCC for descriptive and inferential statistics.

The analysis of data was carried out only after taking the written consent from the organization head. No harm to the PLHA and confidentiality of identity have been assured as only the secondary data has been analyzed. Mean, mode, IQR and standard deviation were applied for descriptive analyses and correlation and chi-square tests were applied for inferential statistics since only two variables followed normality (Sapiro-Wilk Test); weight (p=0.13) and age (p=0.10). SPSS 17.0 version and MS-excel were applied for the data entry and analysis. Alpha level was set at 0.01 and 0.05 for testing of significance.

## RESULTS

### Demographic characteristics of PLHIV admitted in CCC

**Table1: Association of demographic characteristics with PLHIV**

Characteristics	Stay duration in weeks		x <sup>2</sup> value	p value
	≤ 2 weeks	> 2 weeks		
<b>Age in yrs (n=62)</b>				
<30	11 (73.3)	4 (26.7)	4.96	0.175
30-40	14 (70.0)	6 (30.0)		
40+	13 (48.1)	14 (51.9)		
<b>Sex (n=62)</b>				
Male	17 (51.5)	16 (48.5)	2.84	0.092
Female	21 (72.4)	8 (27.6)		
<b>Occupation (n=62)</b>				
Agriculture	35 (64.8)	19 (35.5)	1.19	0.275
Non-agriculture	3 (37.5)	5 (62.5)		
<b>Residence (n=62)</b>				
VDC	33 (66.0)	17 (34.0)	1.49	0.221
Municipality	5 (41.7)	7 (58.3)		
<b>Marital status (n=62)</b>				
Single†	16 (80.0)	4 (20.0)	4.36	0.037
Married	22 (52.4)	20 (47.6)		*

\*significance at 0.05 level;

†includes unmarried/widow(er)/divorced/single/seperated;

The descriptive findings (table 1) revealed that median age was 37 (IQR, 29-42) years. Median duration of stay in the CCC was founded in 13 (IQR 9-18) days. More than two-thirds (43.5%) PLHIV were 40 years and older. More than half (53.2%) PLHIV were male. Almost nine out of 10 (87.1%) had the occupation as agriculture and more than four-fifth were from rural (VDC) residents. More than two-thirds (67.7%) PLHIV were married

### Clinical status of PLHIV admitted in CCC

More than one-fifth (22.6%) PLHIV had previous history of TB. Only less than three-fourth (72.3%)

**Table1: 2 Associative characteristic of clinical status of PLHIV**

Clinical status	Duration in weeks ≤ 2 weeks	> 2 weeks	x <sup>2</sup> Value	p value
<b>OI Prophylaxis status</b>				
Yes	14 (63.6)	8 (36.4)	<0.001	0.99
No	24 (60.0)	16 (40.0)		
<b>Past history of TB</b>				
No	35 (64.8)	19 (35.2)	1.91	0.27
Yes	3 (37.5)	5 (62.5)		
<b>Current ART status</b>				
No	8 (47.1)	9 (52.9)	1.26	0.26
Yes	30 (66.7)	15 (33.3)		

PLHIV were on ART. Almost two-thirds (64.5%) were on prophylaxis of opportunistic infection (OI), however, past history of TB, current ART status and the current status of OI prophylaxis do not show a significant association with duration of stay (table 2).

The median CD4 count of PLHIV was 281 (IQR, 153-375) and almost half of PLHIV (46.8%) had CD4 count ≤250 (Table 3). The mean systolic and diastolic blood pressure was 104.8 (±10.2) and 63 (±12.8) mm of Hg respectively. Mean weight was 45.1 (SD± 9.5) kg. (Table 3).

The median CD4 count of PLHIV was 281 (IQR, 153-375) and almost half of PLHIV (46.8%) had CD4 count ≤250 (Table 3). The mean systolic and diastolic blood pressure was 104.8 (±10.2) and 63 (±12.8) mm of Hg respectively. Mean weight was 45.1 (SD± 9.5) kg. (Table 3).



**Table 3: Descriptive clinical characteristics of PLHIV**

Characteristics	Mean (SD) or Median (IQR)	Frequency (%)
<b>CD4/mm<sup>3</sup> Count</b>		
≤250		29 (46.8)
>250	281 (153,375)	33 (53.2)
<b>Blood pressure (mm of Hg)</b>		
Systolic	104.8 (10.2)	
Diastolic	63.1 (12.8)	
Weight (Kg.)	45.1 (9.5)	
Duration of stay	13 (9, 18)	
Age	37 (29, 42)	

Bivariate correlation of systolic blood pressure (BP), diastolic BP, weight and CD4 count with duration of stay were observed. Bivariate significant association of duration of stay was found with marital status and

**Table 4: Clinical characteristic relationship of PLHIV with duration of stay**

Clinical status of participants	1 <sup>st</sup> order correlation coefficient (p-value)	2 <sup>nd</sup> order correlation coefficient after age adjusted (p-value)
Systolic BP (n=60*)	-0.15 (ns)	--
Diastolic BP (n=60*)	0.01 (ns)	--
Weight (n=62)	0.12 (ns)	
CD4 count (n=62)	- 0 . 3 7 † (0.009)	-0.28‡ (0.027)

\*children (≤ 14 yrs) excluded;

†significance at 0.01 level;

‡significance at 0.05 level

CD4 count was found statistically significant with negative coefficient even after adjustment of age (-0.28, p=0.027) (table:4)

## DISCUSSION

More than two-thirds (43.5%) PLHIV were 40 years and older which is consistent with a study conducted by Nigerian military personnel.<sup>[2]</sup> The significant association of marital status with duration of stay indicates that married participants stay longer in proportion compared to unmarried and widow/ers which indicates that stigma perceived by married

PLHIV is still prevalent in the family and community levels. As a result, they want to stay longer in CCC. This is supported by the findings of a study conducted in Jamaica in 2007 that the avoidant and social contact stigma behaviours related to HIV/AIDS are associated to being married.<sup>[3]</sup> However, in another study, married and single women had higher quality of life (QOL) scores<sup>[4]</sup> as well as currently and previously married women also had higher odds of home-based HIV testing and counselling.<sup>[5-7]</sup> A study conducted in Thailand also indicates that parents are the important care taker of adult PLHIV.<sup>[5]</sup> The finding from a study from Ontario suggests that people living with AIDS (PLAs) also used community based services.<sup>[8]</sup> PLHIV use often non-hospital health and social services and expend much out-of-pocket expenditures.<sup>[9]</sup> The earlier findings even suggested that the socio-cultural factors including poverty impede the Women's utilization of usual health care system and addressed the need of community care.<sup>[10]</sup> Another study conducted in Nepal also showed that non-family support network was greater than family support network.<sup>[11]</sup> The CD4 count could also be one of the criteria for the duration to let stay in CCC, however, further investigation is needed before reaching this conclusion. The findings showed that as the count decreases, the duration increases (adjusted rho,  $\rho = -0.37$ ,  $p=0.009$ ). Similar finding was observed when using logistic regression for predictors of CD4 counts. Appointment nonadherence (number of missed appointments) was a significant predictor ( $p < .03$ ) of having an AIDS-defining CD4 count over and above the effects of number of kept appointments ( $p < .0001$ ), and whether or not the patient was taking highly active antiretroviral therapy (HAART) ( $p < .002$ ).<sup>[12]</sup> However, the CCC standardized operating procedures (SOPs) of government of Nepal recommends to stay for service receivers without symptoms of AIDS related complex (ARC) such as the investigation of CD4 count; to start ART; follow-up; pregnant mothers for PMTCT; stigma and discrimination; stress management. Similarly, TB diagnosed; treatment of TB; ART; severely ill, unable to walk or other similar conditions as with symptoms of ARC. The SOPs recommends from one week for CD4 or TB investigation to a maximum of two months for pregnant mothers to approach PMTCT to stay in the

CCC. However, the variation in CD4 counts is not mentioned as a criterion. <sup>[1]</sup>

## CONCLUSIONS

Based on negative correlation, it is concluded and recommended that PLHIV of lower CD4 count should be considered for longer duration of stay. In addition, married PLHIVs stayed for longer duration compared with single or unmarried, which might be due to discrimination at family and community level. However, further research based on primary and probability sampling is recommended before reaching both conclusions.

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## ORIGINAL ARTICLE

## Situation of Immunization Coverage in Ethnic Minorities of Dhanusha District of Nepal

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### ABSTRACT

Expanded program on immunization is a priority and one of the most cost effective public health programs of the Government of Nepal. The objective of the study was to determine the immunization status of the children of the district; and to find the differences in immunization coverage of the local supervisory areas (lots) to compare with the National Standard coverage of 90%, and to explore the reasons for non-immunization of children of the age group 12-23 months especially in ethnic minorities. A cross sectional survey was conducted using WHO's "Lot Quality Assurance Sampling (LQAS)" method, with 19 samples from all of ten supervisory areas of the district. A total of 210 respondents were interviewed.

All routine immunizations coverage were found by the survey above the national standards of 90%. BCG coverage was 100.0%, DPTHib-3 92.9%, Polio-3 92.4%, and Measles coverage was 89.5%. The immunization card retaining was 64 (30.5%) of the total of 210 sampled mothers. Fully immunized children out of the total 210 sampled children were 182 (86.7%). Relatively the immunization coverage is lowest in religious minorities (80.0%) and in Disadvantaged Terai castes (84.1%)

**Keywords:** EPI coverage, immunization coverage, Lots, LQAS, vaccination coverage

### INTRODUCTION

Immunization is one of the most cost effective public health programs. To be fully immunized, a child should receive: one dose of BCG and measles vaccine, three doses of pentavalent vaccine Diphtheria Pertussis and Tetanus (DPT), Hepatitis-B, Haemophilus Influenza-B (Hib), and oral polio (OPV). The coverage of immunizations were not uniform in 2011/12 and previous years. Thirty one district (41%) had more than 90% coverage for all antigens.<sup>[1]</sup> Likewise, the immunization coverage was not uniform within the district.<sup>[2][3]</sup> The immunization coverage for BCG is 117.07%, DPT3 is 110.19%, Polio3 is 108.97% and Measles is 103.8% in the district.<sup>[1]</sup> There are wide variations and inadequacy of immunization coverage within the district.<sup>[3]</sup> Sting of target for vaccination should

always remain inconsistent with achievement.<sup>[3]</sup> The target set by the Child Health Division of the Department of the Health services of Nepal is of 90% coverage of children 12-23 months.

### MATERIAL AND METHODS

The objectives of the study were to obtain an overall estimate of the vaccination coverage and to determine whether the immunization coverage of each supervisory area (lots) was acceptable or not. Lot Quality Assurance Sampling (LQAS) method

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was used with 19 samples from each of ten supervisory areas of the district.<sup>[4]</sup> A total of 210 samples were taken. The upper and lower thresholds for accepting or rejecting lots were selected. The national immunization coverage of 90% for fully immunized children was set as the upper threshold for acceptance at 95% confidence level. The lower threshold was based on the district HMIS report of 2010/2011 (BCG was 126.27%, DPT-Hep B-Hib 3 was 121.8%, Polio 3 was 121.26% and measles was 100.91%)<sup>[5]</sup> and was set at 60% level. The table to estimate the sample size for LQAS study was used according to the WHO manual.<sup>[6][7]</sup>

## RESULTS

The total number of sampled children in the study was 210 from ten lots in the district. The median age was 18 (in months). Out of 210 children, 64 (30.5%) children's mothers had immunization card. Most of the children (86.7%) were found vaccinated by one year of their age. All routine immunizations were found above the national standards of target of 90%. BCG coverage was 100.0%, DPTHib-3 92.9%, Polio-3 92.4%, and measles coverage was 89.5%. Fully immunized children out of the total 210 sampled children were 182 (86.7%) as shown below in the table no.1. All the lots were homogenous, not heterogeneous, in coverage of the vaccination. Table 2 shows the situation of fully immunized children before 2 years

**Table No.1 showing coverage of complete vaccination of all lots surveyed, Dhanusha, 2012.**

Lot Name	Number	Percent
Janakpur	21	100.0
Kurtha	15	71.4
Dhalkebar	20	95.2
Bengadabar	20	95.2
Sabaila	20	95.2
Parabaha	16	76.2
Duberkot	18	85.7
Yadukoha	16	76.2
Ramdaiya	19	90.5
Dhanouji	17	81.0
<b>Total</b>	<b>182</b>	<b>86.7</b>

**Table No. 2 Fully immunized before 2 years by castes Dhanusha**

Castes category	Immunized Status			
	No	Yes	(Coverage) Percent	Total
Dalits <sup>1</sup>	1	15	93.8	16
Distadvantage <sup>2</sup>	4	43	91.5	47
Disadvantaged caste <sup>3</sup>	20	106	84.1	126
Religion minorities <sup>4</sup>	2	8	80.0	10
Upper caste <sup>5</sup>	1	10	90.9	11
<b>Total</b>	<b>28</b>	<b>182</b>	<b>86.7</b>	<b>210</b>

<sup>1</sup> Barhi, Paswan, Ram and Sharma castes

<sup>2</sup> Bhujel, Kalikote, Lama, Mahara, Majhi and Mandal

<sup>3</sup> Bhagat, Dafali, Gupta, Jaisawal, Kurmi, Mahaseth, Mahato,

<sup>4</sup> Mukhiya, Pandit, Sah, Sahani, Sonar, Thakur and Yadav

<sup>5</sup> Darji, Muslim and Nadaf

by caste category. The different caste group considered in this study is given in the footnote below. Relatively the immunization coverage is lowest in religious minorities (80.0%) and in Disadvantaged Terai castes (84.1%) compared to Dalits and Disadvantaged Janajatis.

### Factors related to the failure of immunization

Out of the total 30 not fully immunized children, the absence of vaccinator was also the failure of immunization in 4 (1.9%) children. Likewise, 3 (1.4%) children were not immunized due to illness. In the same way, 1 (0.5%) child's mother was not aware of the need for immunization and 1 (0.5%) mother was not aware of the need to return for the next dose of vaccine.

## DISCUSSION

Fully immunized children out of the total 210 sampled children were 182 (86.7%). The national standard of NIP coverage has been set 90%. Specifically, the immunization coverage is found low in religious minorities (80.0%) and in Disadvantaged Terai castes (84.1%). However, the recent annual report of Department of Health Services showed that the coverage of measles of Dhanusha District was 103.8% (1). A survey report of Rautahat, a similar

district of Terai, showed coverage BCG 96.7%, DPTHb3 90.0%, Plio-3 97.6% and Measles 78.1%.

<sup>[8]</sup> Similarly, Nepal Demographic and Health Survey (NDHS) 2011 showed that the national coverage for children 12 -23 months for full immunization was 87%, BCG was 96.5, DPT3 was 91.4%, Polio 3 was 92.1% and measles was 82.3%. Similarly, it is reported that out of 75 districts, 57 (76%) had >80% coverage for DTP-Hib-HepB3, 31 (41%) had >90% coverage for measles in 2011. <sup>[9]</sup> These literatures increase reliability of the findings of the survey, i.e. 86.7% coverage of fully immunized children. The null hypothesis that lots were not difference in vaccination coverage was accepted. All the lots were homogenous, not heterogeneous, in coverage of the vaccination. The failures for missing immunization of children were due to the factors concerned with the irregularities of vaccinators/village health workers (VHWs) and maternal child health workers. Assessment of the immunization system to identify the need to introduce new vaccines into national and local immunization systems were to be implemented. <sup>[10],[11]</sup> Immunization surveys and HMIS records for low vaccination coverage should have been analysed to identify the reasons like behavioural and social determinants. Prioritization of target population conducted by segmenting the population, according to vaccination coverage and susceptibility to vaccine preventable diseases should have been introduced. Planning, setting objectives, evaluation and monitoring of immunization programmes appropriately conducted in the context of Nepal as guided by WHO <sup>[12]</sup> were not found in the immunization system.

## CONCLUSION

The immunization coverage for full immunization was 86.7% and for measles was 89.5%, which are below national standard level of 90%. All the lots of the district were homogenous in immunization coverage. Relatively the immunization coverage found low in religious minorities and Disadvantaged Terai castes. The most common reasons for not immunizing the children were absence of vaccinators, long travelling distance and illness of children.

## RECOMMENDATION

Sustain the current immunization status. The measles vaccination should be enhanced. Vaccinators should be recruited. Intensive monitoring of VDC coverage by categorizing as per their performance within the district should be implemented. More focus should be given to the religious minorities and Disadvantaged Terai caste group for enhancing immunization coverage in the district.

## ACKNOWLEDGEMENT

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## REVIEW ARTICLE

## Scientific Writing and Paper Publication: A Gateway of Disseminating and Communicating a Research Finding in a Scientific Manner

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### ABSTRACT

Scientific writing and paper publications are a crucial work for the researcher/scientists. Clear communication of the research finding is essential to the growth and development of science and professional practice. Many researches in different field often remain in hidden form just fulfilling the formalities, is never exposed to the broader research community. Researchers who discover the wonders of science must tell someone about their findings in clear, complete, and concise form. The most important communication media are the scientific peer reviewed journals. Most scientific papers are split into four main sections: Introduction, Methods, Results and Discussion (IMRAD). Before starting the introductory part, the title should clearly be written. It should accurately and adequately describe the subject and the contents of the paper in as few words as possible. The introduction is usually a continuous piece of text. An introduction should include at least four key concepts: significance of the topic, the information gap in the available literature, a literature review in support of the key questions, and subsequently developed purposes/objectives and hypotheses. The methods section should clearly describe the specific design of the study and provide clear and concise description of the procedures. The Results section typically has two different components - a written description of the study's findings and tables and figures that help the reader grasp the results in a more visual form. The function of discussion section is to present the analysis done and convey what the data mean considering your data in the context of other studies. Each reference cited in the text must be listed. Copying text or even presenting ideas from published works without citing them is a form of plagiarism and must be avoided. Scientific journals differ widely in the format in which references are cited in the text and listed at the end of the paper. There should be an obvious logical connection between paragraphs and each section. We have to impress the reader with a project, not by knowledge of the dictionary. Writing should be clear and easy to understand. Guideline provided by the journals should be followed carefully

### INTRODUCTION

#### General background

Research in various areas is of value only if the results are understood and applied. Although how this is done is a matter of great debate, clearly of major importance is the collation (meal/banquet) and transmission of the results of research in a manner that it can be accessed and used by others.<sup>[1]</sup> Conducting scientific research is only the beginning of the scholarship of discovery. In order to make the

results of scientific research to be accessible to other professionals and have a potential effect on the greater scientific community, it must be written and published.<sup>[2]</sup> Hence the scientific writing and publication is the process of preparing and publish-

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ing the research finding in scientific and systematic manner. A scientific or research article or paper is a technical document that describes a significant experimental, theoretical or observational extension of current knowledge, or advances in the practical application of known principles<sup>[3]</sup>

Scientific communication is essential for helping us to use and take care of this earth. Communicating science usually means communicating new knowledge or summarizing the present state of knowledge. Clear communication of the findings of research is essential to the growth and development of science and professional practice. Researchers who discover the wonders of science must tell someone about their findings in clear, complete, and concise form.<sup>[4]</sup> To add to the pool of scientific knowledge, researchers must synthesize available information with what they discover. If a researcher/scientist garbles words or leaves out important points, messages become unclear, and the progress of science suffers.

No special talent is required nor is magic involved in clear communication. It's simply a skill developed for exchanging meanings with words and other symbols. Meanings associated with those symbols must be the same for both the sender and the receiver. Much research in different field often remains in files, notebooks, document folders on computers or in little seen or distributed, 'internal' reports and is never exposed to the judgment or scrutiny of the broader research community. The main reasons behind this are

- ⇒ A lack of knowledge, experience and confidence in the skills
- ⇒ Wrong processes of bringing results to other potential users in an acceptable form.

Human beings have been able to communicate for thousands of years. Yet scientific communication as we know it today is relatively new. Science can be communicated in different forms. The notable ones are: Papers in scientific journals, reports, conference papers and abstracts, graduate and post-graduate theses, review papers, proposals, popular science articles, newspaper articles, oral presentation and posters. The most important communica-

tion media are the **scientific peer reviewed journals that covers** original research article, review article/ Meta analysis, Letter to editor, Case report/Case series, View point, Short communication.

The first journals were published in 1665 just only 350 years ago from France; "Des Scavans" and London; "Philosophy of transaction of the Royal Society". The structural form of journals was started to publish only about 100 years ago. There were about 25,400 active scholarly, peer-reviewed journals in early 2009, collectively publishing about 1.5 million scientific articles a year.<sup>[5]</sup> Currently it is estimated that more than 70,000 scientific journals are published worldwide.

### **Why scientific writing and publications are important?**

- ⇒ To impart the necessary knowledge and skills for effective scientific writing to enable researchers and host organization to publish and disseminate the findings of their research activities to the appropriate audiences in a smoother, more timely, and efficient manner
- ⇒ To identify difficulties, constraints, and bottleneck to this process and improving the process
- ⇒ No publication, no project
- ⇒ No publication, no promotion
- ⇒ No publication, no funding

### **The common problems in general papers**

- ⇒ The paper is too long.
- ⇒ The writing and figures are not clear.
- ⇒ Its subject matter is not suitable for the journal.
- ⇒ It is not well structured.
- ⇒ The author has not explained the general interest of the specific issues.
- ⇒ The author assumes too much specific knowledge from the reader.

### **Key questions to be addressed during the scientific writing and publication**

- ⇒ Who are you addressing -scientists who are specialists in your field of research, a wider group of scientists, fellow students, or public audiences?
- ⇒ Why is your message important?
- ⇒ Why are you communicating it?



- ⇒ What are your main findings or messages?
- ⇒ How can you best deliver your message and satisfy the audience's needs?

### **Sentence structure, Language and grammar**

This is the key of writing a report in the logical and structured form. It is better to start the writing from general and move towards more specific ideas. There should be an obvious logical connection between sentences and paragraphs. The main or theme point in a paragraph should only one. If a paragraph contains too many themes, it creates confusion to understand; so better to write a new paragraph or paragraphs. Use plain words. Try to impress the reader with the project, not the knowledge of a dictionary. Avoid jargon and abbreviations as they may not be widely known. Never write longer sentences that are hard to follow. Shorter sentences help to write concisely. The writing should be a clear and concise form so that it is easy to follow and keeps writing from being swamped with unnecessary words. We can be a very good writer without knowing much about grammatical terms. Simple writing is often easier to follow than the writing that uses complex structures. Remember to use the same tense throughout the paper. All journals have strict word limits! So be careful about the guideline provided by the journals.

## **THE STRUCTURE / CONTENTS OF A SCIENTIFIC PAPER**

The structure is absolutely crucial to scientific papers. It is also fairly standardized, which makes life easier! Most scientific papers are split into four main sections: introduction, methods, results and discussion. Before starting the introductory part the title should clearly be written. The introduction is usually a continuous piece of text, but the other sections often have subsections. For example, methods might split into field methods and statistical methods. In some journals, especially those that encourage very short articles, some sections may be joined together (e.g. Methods and results, or results and discussion). However, even in these cases, the continuous text usually deals with things in the same order. <sup>[6]</sup>

### **Title**

A title is a 'label', not a grammatical sentence. The title of a research paper should accurately and adequately describe the subject and the contents of the paper in as few words as possible. This should provide a specific summary of the proposed work. <sup>[6]</sup> It should be easy to understand. Journals often limit the number of words that can be used to, e.g., 25 words or less. Only the first word in the title (except for proper nouns) has a capital letter. A title has no verb and does not end with a full stop (period). Should contain as many "key words" as possible—most important one comes first, or early in the title. If the title includes the name of any plants or animals, either as common names (if these exist) or scientific names, but not both. During preparing the title, the author should be conscious of avoiding abbreviations, formulas, brand names, and unusual terms. Generally the title should not have dates, unnecessary words and phrases, such as "Observations on", "An investigation into", etc. The title should be accurate and specific. It always describes the subject of the work, not its results. Titles are used in cataloguing and abstracting, in electronic /internet databases, and will be in the reference list of other research publications. <sup>[7]</sup> The important thing we have to put in mind that we always need to follow the style preference of the publication for which we are writing.

### **Abstract**

The abstract is a summary of the article or study finding allowing the readers to get a quick glance of what the contents of the article include. <sup>[7]</sup> Writing an abstract is rather challenging as being brief, accurate and concise are requisite. The headings and structure of an abstract are usually provided in the instructions for authors. <sup>[2]</sup> The abstract should be more definitive rather than descriptive; that is, it should give facts rather than, say the paper is 'about' something. A good abstract is short—usually 150 to 300 words, usually in one paragraph. It stands on its own, is complete in itself (it may be published separately in secondary sources) and briefly describe the problem and the solution. The Abstract includes; the objectives and purpose of the work, an outline of the 'materials and methods' (with details

of new techniques or equipment). Scientific and common names of organisms complex-Names (e.g. of chemicals, or terminology) may be set out at first mention with an abbreviation that is used subsequently. It should *not contain* references to tables or figures, as these appear only in the paper, abbreviations or acronyms unless they are standard or explained, references to literature cited, any information or conclusion not in the paper itself and general statements or abstracts; findings should be given as hard facts.<sup>[7]</sup>

### **Introduction**

The introduction is one of the more difficult portions of the manuscript to write. Past studies are used to set the stage or provide the reader with information regarding the necessity of the represented project. For an introduction to work properly, the reader must feel that the research question is clear, concise, and worthy of study.<sup>[2]</sup> A good introduction is relatively short. In general, it tells why the reader should find the paper of interest, tells why the author carried out the research, gives the background the reader needs to understand and judge the paper. Specifically it- defines the nature and extent of the problems studied relates the research to previous work-perhaps by a brief review of the literature, but only that which is clearly relevant to the problem, explains the objectives and method of investigation, including, if necessary, the reason why a particular method was chosen and defines any specialized terms or abbreviations to be used in what follows.<sup>[7]</sup> A competent introduction should include at least four key concepts: 1) significance of the topic, 2) the information gap in the available literature associated with the topic, 3) a literature review in support of the key questions, 4) subsequently developed purposes/objectives and hypotheses.<sup>[8]</sup>

### **Materials and Methods**

The methods section should clearly describe the specific design of the study and provide clear and concise description of the procedures that were performed. The purpose of sufficient detail in the methods section is so that an appropriately trained person would be able to replicate your experiments. There should be complete transparency when

describing the study.<sup>[9]</sup> The function of this section is to describe all experimental procedures, including controls. The description should be complete enough to enable someone else to repeat your work. Dividing the text into sub-sections makes it easier to read lengthy Methods sections.

A clear methods section should contain the following information: 1) the population and equipment used in the study, 2) how the population and equipment were prepared and what was done during the study, 3) the protocol used, 4) the outcomes and how they were measured, 5) the methods used for data analysis. Initially a brief paragraph should explain the overall procedures and study design. Within this first paragraph there is generally a description of inclusion and exclusion Criteria which help the reader understand the population used. The paragraphs that follow should describe in more detail the procedures followed for the study. A clear description of how data were gathered is also helpful.<sup>[2,7]</sup> In the methodological part the author should Explain why each procedure was done in the Experimental protocols sub-section, i.e., what you were measuring and why. Mathematical equations and statistical tests are considered mathematical methods and should be described in sufficient detail. Be as specific as possible when describing equipment, reagents, chemicals, commercial products, tools, etc. Typically, this will also include manufacturer name, location, and model numbers. For example: "Model 3210 dual-channel oscillograph (Harvard Apparatus, Cambridge, Mass.)" or "TRIS HCl buffer (Sigma Chem. Corp., St. Louis)". Be as specific as possible with identification of experimental subjects including (where appropriate): number used (n=), Genus and species, sex, age, size (dimensions, mass), physical condition, and conditioning prior to experimentation. This may include source (supplier or geographic location of sampling), housing length and conditions (temperature, light, etc.), what and how often, where appropriate and commercial supplier's names as you would for equipment.<sup>[7]</sup> The final portion of the methods section will include the statistical methods used to analyses the data. Most scientific journals to support the need for all projects involving humans or animals to have up-to-date Documentation of ethical approval. The methods section should include a clear



statement that the researchers have obtained approval from an appropriate institutional review board.<sup>[10-11]</sup>

## **Results**

This is the core of the paper, presenting the data have found by the study. It is usually easiest to follow the results if you present them in the same order as you gave the objectives in the introduction. Well presented results are simply and clearly stated<sup>[11]</sup> The Results section typically has two different components - a written description of the study's findings, as well as tables and figures that help the reader grasp the results in a more visual form. The results of statistical tests applied to your data are reported in this section, although you need not say anything about their implications for the viability of the hypothesis you tested; save this for the Discussion. The following guidelines will help you to write a strong Results section that conforms to the stylistic conventions of many scientific journals.<sup>[7]</sup>

- ⇒ Do not present raw data (data in the same form as collected or provided) in your reports. You must analyse data mathematically/statistically for proper presentation.
  - ⇒ In the text of the Results section, you should present the major trends (if any) in the data and indicate whether these trends are statistically significant. You can also make quantitative comparisons to give the reader an indication of the strength of an effect, for example "Testosterone injected males were about three times more likely than controls to be selected by a female." While it is important to provide means and standard errors for each of your treatments, this is often most efficiently done in the form of a table. If these numbers are presented in a table, there is no need to repeat them in the text of the Results section, just make sure you cite the table.
  - ⇒ All results should be presented, including those that do not support the hypothesis.
  - ⇒ The results contained in figures and tables must be introduced in the text, and in the order in which they are presented.
- ⇒ The results of statistical tests can be presented in parentheses following a verbal description. For example, you might say "Testosterone treatment had a significant positive effect on strutting behaviour in males ( $t = 2.4$ ,  $DF = 198$ ,  $p = 0.02$ )." See also "Tables and Figures" below.

## **Tables and Figures**

Tables and figures should be used when they are a more efficient way to convey information than a written description. Tables and figures must be accompanied by explanatory captions that allow them to be understood by someone who has not read the text. Information in the tables and figures should not be repeated in the text, but do cite the tables and figures, with a summary statement when that is appropriate<sup>[7, 12]</sup>

Do not repeat information in a table that you depict in a graph; include a table only if it presents new information. It is easier to compare numbers by reading down a column rather than across a row. Therefore, the list sets of data you want your reader to compare in vertical form. Provide each table with a number (Table 1, Table 2, etc.) and a title. The numbered title is placed above the table. Tables should only be delineated by horizontal lines, and these may only separate headings from data (not rows of data from each other). Vertical lines are not typically used. Figures. These may include graphs and illustrations (drawings), and photos. Provide each figure with a number (Fig. 1, Fig. 2, etc.), a short title and a caption that explains what the figure shows. The numbered caption is placed below the figure. In general, the figures should be computer generated and not hand drawn. Do not crowd too many figures onto one page - no more than two is a good rule of thumb. Some formats allow for figures and tables to be embedded in the text, others require them to be on separate pages. Check with your instructor on this issue.

Graphs can be used to compare two (or sometimes more) variables. Line graphs and scatterplots show continuous change, whereas bar graphs show

discrete variables only. You can compare groups of data by plotting two or even three lines on one graph, but avoid cluttered graphs that are difficult to read, and do not plot unrelated trends on the same graph. Plot the independent variable on the horizontal (x) axis and the dependent variable on the vertical (y) axis. Label both axes and include units of measurement. [7, 10-12]

There are many online sources on how to make high quality graphs. Drawings are used to illustrate organisms, experimental apparatus, models of structures, cellular and sub-cellular structure, and results of procedures. Photos may make up an entire figure or a panel within a multi-panel figure. Most journals have strict rules about how the photos in figures may or may not be manipulated. For example, cutting and pasting of bands from scans of electrophoresis gels is strictly forbidden if it misrepresents the data in any way. It is good practice to include a scale bar that gives the reader an indication of the size of the objects in a picture. This is especially important for pictures taken with microscopes. Most journals have minimum requirements about the resolution of the photos used in figures. [7]

### **Discussion**

The function of this section is to present the analysis you have done and convey what the data mean in the context of the question you have asked and the predictions you have tested. You should also consider your data in the context of other studies. Do not discuss extraneous ideas, concepts, or information not covered by your topic/paper/commentary. Be sure to carefully address all relevant results, not just the statistically significant ones or the ones that support your hypotheses. When you must resort to speculation or opinion, be certain to state that up front using phrases such as "we therefore speculate" or "in the authors' opinion". [2, 7] The Discussion should contain at least:

⇒ An interpretation of results and a presentation of argument (s) about the significance of the results. Also discuss the relationship between the results and the original hypothesis, i.e., whether they support the hypothesis, or cause

it to be rejected or modified.

- ⇒ An integration of your results and those of previous studies (the primary literature) into arguments to arrive at explanations for the observed phenomena. Avoid long descriptions of other studies unless you are directly relating the findings to your own data.
- ⇒ Possible explanations for unexpected results and observations, phrased as hypotheses, which generate predictions that can be tested. These must be realistic experimental procedures, which you should briefly describe.
- ⇒ A statement of limitations of experimental design. If you suspect that your results may have been affected by a confounding variable that you did not control, you should discuss that here.
- ⇒ Trends that are not statistically significant can still be discussed if they are suggestive or interesting, but cannot be made the basis for conclusions as if they were significant.
- ⇒ Avoid redundancy between the Results and the Discussion section. Do not repeat detailed descriptions of the data and results in the Discussion. The best way to appreciate how authors accomplish this is by reading and emulating published papers. Be sure, however, to discuss each trend you identified in the results.
- ⇒ End the Discussion with a statement of conclusions and a summary of the principal points you want the reader to remember. This is also the appropriate place to propose specific further study if that will serve some purpose, but do not end with the cliché that "this problem needs more study." Some journals require that the last paragraph of the paper be a short conclusion section that is set off by the subheading "Conclusions," but many do not. You should check with your instructor to determine whether or not to include a Conclusion section.

## **REFERENCES AND LITERATURE**

## **CITATION**

You need to list the references you have cited in your text. Things that should be cited are other authors' ideas or facts shown by previous work. You should always cite the original authors – but don't pad out the references to impress the reviewers. There are fairly strict rules concerning how you write references, and you need to follow the exact format requested by the journal. Spell the authors' names and journal titles correctly – they may be asked to referee your paper! <sup>[6]</sup> Each reference cited in the text must be listed in the Literature Cited section and vice versa. Remember that copying text or even presenting ideas from published works without citing them is a form of plagiarism and must be avoided. Scientific journals differ widely in the format in which references are cited in the text and listed at the end of the paper. Some use the "author, year" format for in-text citations, while others use numbers (in brackets, parentheses, or superscripted) for the same. Be sure to check with your instructor to determine which format you should use for your paper. <sup>[7]</sup>

Most researchers use some sort of reference software for managing references in their papers. Some of the more popular ones are End Note, Reference Manager, and Ref Works, Pro Cite, Papyrus etc. These programs can be incredibly useful for managing references in papers with large numbers of references or just building a library of useful references for a particular project. So use such bibliographic software for referencing if possible. <sup>[6,7]</sup> Scientific journals also differ in the general format they require for submitted manuscripts. The author always should check the instructor about the specific format using in the paper. Avoid Plagiarism, and inadvertent lack of citations.

Finally, use citations to your benefit. Cite frequently in order to avoid any plagiarism. The bottom line: If it is not your original idea, give credit where credit is due. When using direct quotations, provide not only the number of the citation, but the page where the quote was found. All citations should appear in

the text as a superscripted number followed by punctuation. It is the authors' responsibility to fully ensure all references are cited in completing forms, in an accurate location. Please carefully follow the instructions for citations and check that all references in your reference list are cited in the paper and that all citations in the paper appear correctly in the reference list. <sup>[2]</sup>

## **AUTHORSHIP**

Before starting the project, any researcher should decide on authors, and their order, as early as possible. Authors should include only those who have made a substantive intellectual contribution to the project reported, and can defend the data and conclusions publicly. The student who did the experiments and wrote the first draft of the manuscript, the PI who had the idea in the first place, guided the student, and reviewed the manuscript, the department chair who provided space and resources for the study, dropped by the lab occasionally to chat, but knew little or nothing about the experiments, can become the authors.

### **Criteria for authorship**

- ⇒ Generate at least part of the intellectual content
  - ◆ Conception or design of the work
  - ◆ Data analysis and interpretation
- ⇒ Draft, critically review, or revise the intellectual content
- ⇒ As collecting data is not enough to make a person an author, technicians and other helpers are usually mentioned in the acknowledgements
- ⇒ Each co-author should give final approval to the version that is to be published
- ⇒ Unless names appear alphabetically, the first person listed is considered the senior author; others may be listed according to the importance of the contribution to the experiment.
- ⇒ Sometimes the head of a laboratory or institute wants to be considered an author of all papers

coming from the organization; a proper place is as the last author, recognized as a position of importance

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