# A Study on Cord Care Practices in Bardiya District

**April 2007**

**Nepal Family Health Program**
**Sanepa, Lalitpur**
**Nepal**

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Study Team
April 2007

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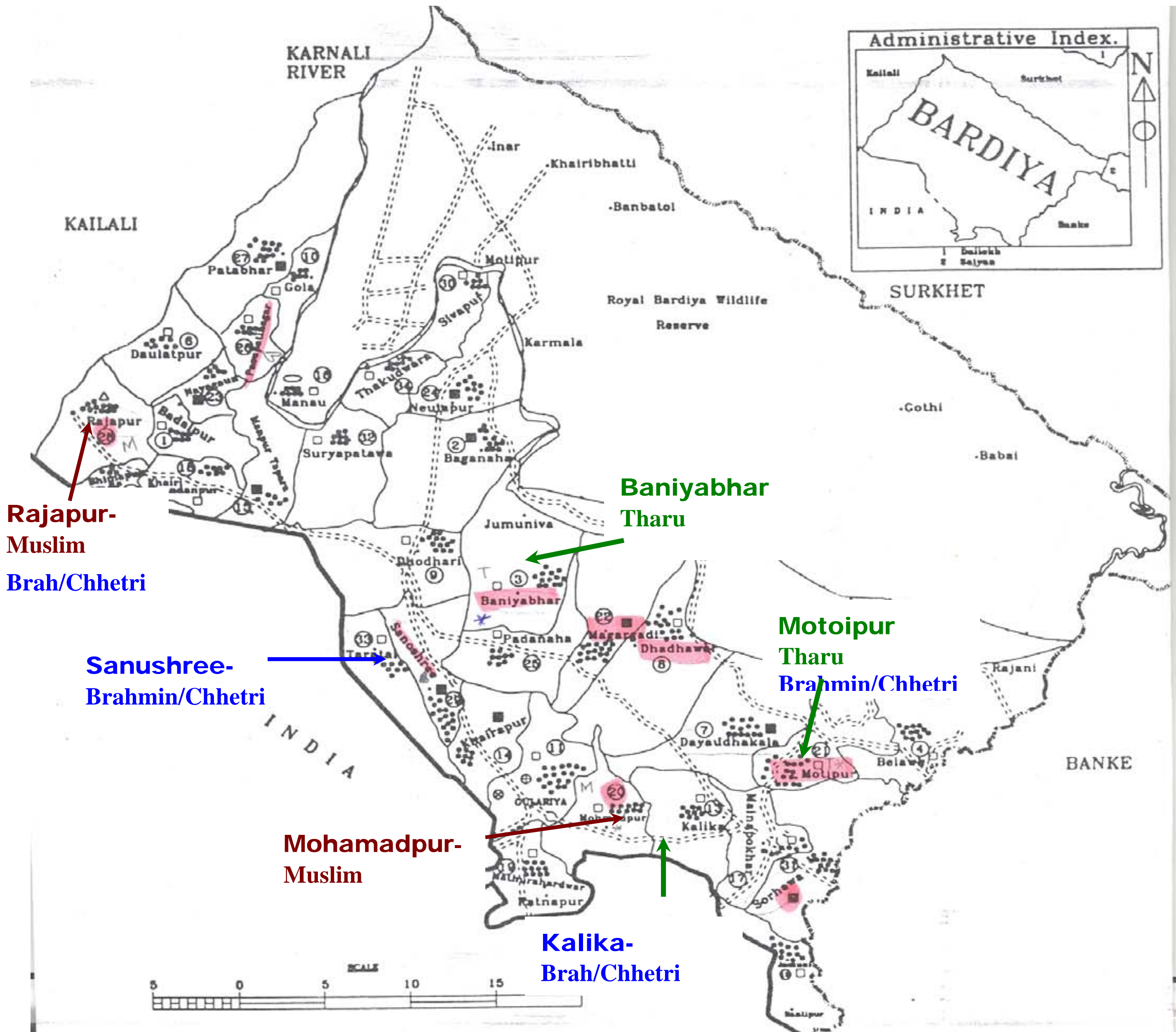
**STUDY AREA**




**Bardiya District**

## STUDY TEAM

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# ABBREVIATIONS

| | |
|---|---|
| AHW | Auxiliary Health Worker |
| ARI | Acute Respiratory Infection |
| CDD | Control of Diarrhoeal Diseases |
| CHDK | Clean Home Delivery Kit |
| CHX | Chlorhexidine |
| DIL | Daughter in Law |
| FCHV | Female Community Health Volunteers |
| FGD | Focus Group Discussion |
| GM | Grand Mother |
| HA | Health Assistant |
| HP | Health Post |
| HW | Health Worker |
| HIV/AIDS | Human Immune Deficiency Virus/Acquired Immuno Deficiency Syndrome |
| MCHW | Maternal and Child Health Worker |
| MCHP | Maternal and Child Health Products |
| M&E | Monitoring and Evaluation |
| MIL | Mother in Law |
| NFHP | Nepal Family Health Program |
| RDW | Recently Delivered Women |
| SSI | Semi Structured Interviews |
| TBA | Traditional Birth Attendant |
| VDC | Village Development Committee |
| WHO | World Health Organization |

# EXECUTIVE SUMMARY

Every year globally, an estimated 4 million infants die and approximately two-third of all these deaths occur in the neonatal period (NNHS, 2004). A substantial proportion of deaths from infection are due to cord infections (WHO). Nepal has one of the highest neonatal mortality rates in the world which is 34 per 1,000 live births. Neonatal Mortality Rates currently accounts two-thirds of all infant mortality (MoHP, New ERA and Measure DHS, 2006). In Nepal, most deliveries are conducted at home without the aid of skilled health worker in unhygienic way, which is usually accompanied by a high rate of infection in both mother and newborn.

Chlorhexidine is a proven antiseptic to reduce infections on neonatal cord. FCHVs for household level maternal and neonatal care practices have been mobilized under the current CB-MNC program being implemented in Banke, Jhapa and Kanchanpur districts. This gives an opportunity to introduce chlorhexidine at the community level combining with the CB-MNC package. In this context this qualitative study has been conducted in Bardiya- an adjoining district to Banke, for identification of an appropriate formulation, packaging and delivery of chlorhexidine.

The overall objective of the study was to explore the current cord-stump and skin care practices including current notions about best care for cord-stump, vulnerability and protection among Tharu, Muslim and Hill-Brahmin/Chhetri caste groups of Bardiya district. In addition this study also attempts to explore the most readily acceptable formulation of chlorhexidine application by the community members.

The sample size consists of 45 SSIs and 10 FGDs conducted in six VDCs of Bardiya. SSIs were conducted with RDW and GMs of Tharu, Muslim and Brahmin/Chhetri castes, cord cutting occupational groups and FCHVs serving in the local communities. The study was conducted from November 2006 through January 2007 and was implemented internally by NFHP M&E Team.

## I) Current Cord Care Practices

In Bardiya, most of the births take place at home and without the assistance of trained health worker but with the help of Sudenis, family members and neighbors.

<u>Instruments used to Cut Cord:</u> The use of CHDK is less common among all the castes because of lack of awareness of the kit, unavailability of the kit, not purchasing kit beforehand, delivery of child before time, high cost of CHDK and due to easy availability of blade and thread separately at minimal cost.

Boiled new thread and boiled new blade is almost universally used to tie and cut cord respectively. The major reason for the wide use of new blade and thread is their easy availability in the local markets. Thick white thread *(Batuwa, dhago, Kaccha dhago, Ujla seto dhago, moto bateko dhago*) is used to tie cord due to its strongness, less risk of cutting neonate's delicate skin, and easy availability. Some used the thread that was already available in their home. Those who used CHDK used its thread and blade. Sudenis, RDW, GMs and their family members are well aware of the consequences (infection, wound, tetanus and subsequently death) of using old/used blade, rusted knife, sickle, old thread and other instruments to cut the cord. However, sometimes

due to haste, the families also use old or un-boiled blade to cut the cord despite knowing that it could be harmful.

Process of Cord Cutting: Cord cutting of a newborn is done immediately after the delivery of child and placenta. Mostly, in all the caste groups a typical occupational caste woman- Tharuin/Chamarin (Sudeni) cuts the newborn cord. The Muslims always call *Tharuin* or *Chamarin* (Sudeni) to cut the cord of newborn while Tharus are helped by health workers, FCHVs and Sudenis in cord cutting. Brahmin/Chhetri cut cord by the help of own family members or by the Sudenis.

The process of cord cutting is almost same in all the study castes. Firstly, the *Sudeni* washes her hands with water and soap and cleans/washes the newborn with a clean cloth, often soaked with mustard oil. Mostly the family members and sometimes the *Sudeni* boil blade and thread and make it ready for cutting. Sudeni then ties cord with the thread at 1 to 3 places, leaving a fore finger length of cord stump. Before tying the cord, its content is pushed towards the stomach, placed in a plastic/metal coin and is cut with the boiled blade. The cord is cut mostly within an hour of birth in all the castes. After cutting, the cord is mostly buried or thrown away. The cord stump left over after cutting mostly falls on the fourth or on the fifth day.

Majority of the Sudenis interviewed were trained on cord cutting. They were providing services to all families irrespective of their religion and caste but were mostly serving the poor and uneducated.

## II) Community Knowledge Regarding Cord Care

The umbilical cord is called by different names such as ***Dhonri, Lara and Nal*** and the cord stump as ***Navi and Dhonr*****i**. Most RDW and GMs had difficulty in explaining the functions/importance of the umbilical cord of a neonate while the child is inside the mother's stomach, during the delivery and after the delivery. Some said that the cord helps child to breathe while inside the mother's stomach; helps to transfer food and nutrients from mother to child while inside the mother's stomach; and helps child and placenta *(Purain)* to come out during delivery. All women said that the cord has no function after the delivery of child and it should be cut off and thrown away. There were no caste differences about the understanding of umbilical cord.

## III) Knowledge and Current Practices Regarding Application of Substances to Cord Stump

Substances Used on the Stump: Usually nothing is applied on the cord of newborn until the cord is cut. Immediately after the cord is cut mustard oil *(Lahi ka tel*, *Kaduwa oil)* mixed with Turmeric, *hing, jwano*, onion and garlic is almost invariably used. There are some variations by caste in the types of substances mixed with the mustard oil. The mixture of mustard oil is applied 2-3 times daily on the stump over the first week of cord cutting. The application of oil on the stump takes place during neonatal body massage. However, if there is infection or other problem on the stump, then application of the mixture is more frequent. Mustard oil is perceived as healing wound; helps in falling and drying of cord stump; easily available and applicable; greasy; soft; prevents from infection; keeps body warm and kills pain.

The Muslims also use "Nurani oil", "Majidi oil", powder and penicillin on the stump of newborn whereas Tharus use *sindoor* and ash of cow dung (*Kanda ko bhuwa*). The decision to use of

substances on the stump and to massage the body is mostly done by the MIL or the mother herself. Sometimes S*udeni* also makes such decisions.

Newborn's Body Massage: Mustard oil is universally used to massage body of a newborn. The body massages of a child takes place along with the massage of mother. The same oil mixture is used for messaging both mother and child. Mustard oil is considered to keep body hot and healthy while few used it because of their inability to buy other oils. During winter child is massaged with heated oil. Usually newborn's body is massaged 2-3 times a day until the newborn is 3 to 5 months old.

Problems Related to Neonatal Stump and Care Seeking: Common problems related to cord stump and skin occurring in the communities are swelling of stomach; black/bluish coloration of skin, water filled blisters, infection, dry skin, red blisters, bleeding and pus discharge. However, most mothers and grand mothers interviewed had not faced such problems with their recent child or grandchild. At homes, Tharus put *Sindoor,* ash of cow dung and powder on wounded stump. For treatment newborn is taken to a private clinic or to a health post. Sudenis and FCHVs are also consulted whenever there is problem with the child's cord.

## IV) Identification of Appropriate Individual to Provide Cord Care

Cord of a Muslim neonate is cut exclusively by Tharuin or Chamarin while that of Tharu is cut mostly by *Sudeni* and occasionally by health workers. Hence, among Tharus and Muslims, family members have not much to do in the cord cutting except buying blade and thread, and boiling them. Family members of Brahmin/Chhetri cut neonatal cord and occasionally others cut it. Hence, all the things are done by the family members. Body massage and application of oil on the stump is also done by Sudeni in Tharu and Muslim community over the first week, while in Brahmin/Chhetri community it is done by the RDW and MIL. Household and community have limited role in cord cutting and caring. During delivery elderly women from neighborhood come to the family and help the stomach and back massage of the women. The role of FCHVs in cord cutting and caring is important. FCHV at many instances become present during the delivery and advise Sudeni on safety measures.

## V) Acceptability of Chlorhexidine

Type of Chlorhexidine formulation that would be most acceptable to the community was also explored. There was no real formulation of CHX decided by the time of the study, therefore two proxy products – soaked towelette and Johnson's baby lotion, which did not contained chlorhexidine, were tested in the communities. The respondents were shown the products, told about its use and were also asked to touch it. Questions related to the physical structure, easiness to use, product preference, mode of supply, packaging, willingness to use and pay, and naming of the product were asked to occupational castes and FCHVs during SSI and RDW and GM during FGD.

Opinion towards Color and Smell and Easiness to Use: There was no variation in the findings by caste. Women were not very much concerned about the color and the smell of both the products and most liked it. However, few remarked that lotion looks somewhat hotter. Most found lotion easier to use compared to towelette as it could be applied with fingers and cotton. The texture of the towelette was considered rough and cold therefore not very appropriate to apply on the stump of a neonate.

Appropriate Time and Person to Use: Majority opined that the product should be used immediately after cord cutting. A majority of the FCHVs and Sudenis said that it should be applied by *Sudeni* followed by mother. Tharus and Muslims grand mother said FCHVs and Sudeni as appropriate persons to apply the products on neonatal stump while Brahmin/Chhetri said mother or grandmothers as appropriate persons to apply it.

Product Preference: Lotion is preferred over the towelette by most of the women because lotion is considered easier to use on the stump, is oily therefore makes stump soft and clean, is effective for longer period, spreads over skin and gets absorbed easily, could be used repeatedly, has better color and smell, is hotter than towelette, and heals wound. However, few preferred towelette over lotion because towelette could be easily opened from packet and used, and prevents from infection as it does not require direct hand contact to the neonate's skin.

Preferred Mode of Supply and Packaging of the Chlorhexidine Product: Sudenis and FCHVs viewed that they themselves are the appropriate persons to supply the products to families whereas most RDW and GMs liked FCHVs. Despite knowing that CHDK is not commonly used most Sudenis and FCHVs preferred packing the chlorhexidine product inside CHDK as people can get a complete set for delivery and cord caring. Some preferred separate packaging as the use of CHDK is low. Many RDW and GM had not seen the CHDK.

Use of Chlorhexidine Instead of Mustard Oil: All the Sudenis and FCHVs opined that the use of chlorhexidine on freshly cord stump could be better than the application of home made mixture as it is a medicine prepared especially to care stump and is therefore safer, stops bleeding, makes stump soft and helps in falling of cord. Sudenis and FCHVs were willing to use by themselves and recommend others to use.

Cost and Willingness to Pay: Cost is the major concern for buying the product. Both Sudenis and FCHVs stressed that it should not be costly. Although different price range were observed among different groups of respondents however it mostly ranged from Rupees 1 to 10 for a single packet. The most preferred price range was Rs 4 to 5.

Based on the opinions of respondents towards the two products, it appears that lotion would be an appropriate formulation as it is perceived easier to use. Though the package of Chlorhexidine lotion sachet is considered better, however the product should be packed inside CHDK as well as separately so that both the users and non-users of CHDK will have access to it. Also, FCHVs followed by Sudenis will be a good medium to introduce the product at families. There should be enough information disseminated to the communities about the product and its use. Lastly, the cost of the product should be affordable to the local communities.

# 1. INTRODUCTION

## 1.1 Background

Every year globally, an estimated 4 million infants die and approximately two-third of all these deaths occur in the neonatal period (NNHS, 2004). Tetanus and infections are among the leading causes of neonatal mortality. A substantial proportion of deaths from infection are due to cord infections (WHO). Some infections in newborns result from exposure of the umbilical cord stump to invasive pathogens. Infections in the umbilical cord stump, including tetanus and omphalitis, continue to contribute to neonatal morbidity and mortality in developing countries (Mullany et al 2005).

Nepal has one of the highest neonatal mortality rates in the world which is 34 per 1,000 live births. Neonatal Mortality Rates currently accounts two-thirds of all infant mortality (MoHP, New ERA and Measure DHS, 2006). Although the infant mortality rate has declined however the contribution of neonatal mortality to infant mortality has not decreased. In Nepal, most deliveries are conducted at home without the aid of skilled health worker in unhygienic way, which is usually accompanied by a high rate of infection in both mother and newborn. Exposure of the freshly cut cord stump to pathogens through hands, instruments, cloths etc. may progress to systemic infection and death of the neonate. During these periods, the topical application of locally available substances on the cord stump may further increase neonatal sepsis.

Use of mustard and other oils in cord stump and to massage whole body of the newborns is an integral part of traditional care practices in many rural communities of Nepal (Mullany et al, 2005). Apart from using oils different substances are also used in the cord stump in the rural communities. A study conducted in Nepal showed that nearly half (48.5%) of the 821 women who had children below three years of age applied some substances in the cord stump such as "oil", "ointment", "powder", "dettol", "ash", "*Harro*" (medicinal herb), "turmeric powder", "jention violet" and "*sindoor*" (vermillion) (VaRG and NFHP 2005a). Another study conducted in Bake, Jhapa and Kanchanpur showed among most recent children born during the three months preceding the survey substances on the stump was used among 56.7%, 28.9% and 34.7% children (VaRG and NFHP, 2005b, 2005c, 2006d). Similarly, a qualitative study conducted in Kailali also showed wide application of mustard oil on cord stump (SCF, 2002). These studies have shown variations in use of substances by characteristics of mothers/caretakers. Elder women, illiterates and Muslims were more likely to use substances on the stump than their respective counterparts.

Care of umbilicus stump has been focused by programs like Saving Newborn Lives (SNL), Community Based-Maternal and Neonatal Care (CB-MNC) and Morang Innovative Neonatal Intervention (MINI) as Essential Newborn Care (ENC) practices at household level. So far, the message for cord care has been to keep the cord stump dry and not to use any substances on it. The percentage of newborns who had nothing applied on their cord stump in Siraha Birth Preparedness Program (BPP), supported by SNL, increased from 42% at the baseline to 71% at end line.

Chlorhexidine is an antiseptic, safe for application on newborn skin, which is already approved by WHO for cord care. It is a widely used antiseptic in clinical settings. Recent studies have shown the effectiveness of applying chlorhexidine (CHX) on the cord stump in reducing neonatal mortality and morbidity in many rural areas. In a study conducted by John Hopkins University

(JHU) in Sarlahi district, application of chlorhexidine to the umbilical area of neonates by trained project staff was associated with significant decrease in neonatal mortality (Mullany et al, 2006). Studies have already shown the ability of chlorhexidine to bind with skin strongly and get absorbed into skin slightly (Mullany et al, 2006). It has been used in health facility based delivery, both for vaginal cleansing and wiping down the newborn and has been found contributing in reducing maternal and neonatal infections and in overall neonatal mortality.

## 1.2 Rationale

The CB-MNC program, supported by NFHP, is being implemented in Jhapa, Banke and Kanchanpur districts, where FCHVs have been mobilized for birth preparedness package (BPP). In Banke, in addition, FCHVs also distribute Misoprostol tablets for the control of post partum hemorrhage in Banke. The result on contact between a household and the FCHVs and distribution of misoprostal at the household level has been encouraging. Because of this, the program has a plan to introduce chlorhexidine in the rural communities of Banke district through the FCHVs and Trained/Traditional Birth Attendants (T/TBAs). This requires identifying an appropriate formulation and packaging of chlorhexidine for use at the community level, and determining who within the household or outside should have the responsibility for its timely application. It is anticipated that chlorohexidine might ultimately be incorporated into birth kits that are sold through the private sector in Nepal. Alternatively, it might be promoted separately, as overall coverage of birth kits remains low. But before the implementation of chlorhexidine for the cord care of newborns by households, it is important to understand their prevailing behaviors and notions relating to cord care so that the CHX packaging, product, and the promotional messages can be designed in such a way so as to maximize the use of the product.

## 1.3 Study Objectives

The study intends to,

1. Identify and document the current cord-stump and skin care practices among Tharu, Muslim and Hill-Brahmin/Chhetri caste groups of Bardiya district.

2. Find out the current notions about best care for cord-stump, vulnerability and protection.

3. Explore the most readily acceptable formulation of chlorhexidine application as perceived by community members.

## 1.4 Research Questions

The study intends to seek answer to following set of questions:

**1.4.1** **<u>Current cord care practices:</u>** What are the current practices for cord care and skin care after the birth of a baby? How is cord cutting done, how it is tied, and what materials are used for it? Who does what? Why? During what days of life are each of these practices carried out and by whom? How is cord cutting observed by families?

**1.4.2** **<u>Community knowledge regarding cord care:</u>** What is the understanding about the function of the umbilicus and umbilical cord before, during and after delivery, or what is the "ethno-physiology" of the umbilicus and umbilical cord? How do these understandings affect practices for cutting and caring umbilical stump?

**1.4.3 <u>Knowledge and current practices regarding application of substances to cord stump:</u>** What substances do people feel is beneficial and harmful to apply to the umbilicus stump and other parts of baby's body immediately after delivery and during the first week of life? Why? What are the characteristics of the substances that are considered good or bad for cord stump? What substances are applied and by whom? Do these substances differ in timing of application? Is application of some substances to the cord used only after "infection" is recognized/perceived?

**1.4.4 <u>Identification of appropriate individual to provide cord care:</u>** Who usually takes care of the cord and who should be the appropriate person within or outside the family to apply chlorohexidine or other antiseptics to the cord and umbilical area after birth? Can someone among the family members be identified and designated for newborn care? or are the Trained/Traditional Birth Attendants (T/TBA) attending the birth, or other community members who are engaged in the postnatal period are the best option? Are there any other providers who visit households after birth to help with certain tasks, and who might conduct oil massage or cord care?

**1.4.5 <u>Acceptability of Chlorhexidine:</u>** What is the acceptability of application of chlorhexidine to the umbilical area at the time of birth, and/or daily during the first week of life? What formulation of chlorhexidine would be most acceptable and valued? What properties/characteristics are valued? Could chlorhexidine substitute the use of other topically applied substances, or would chlorhexidine be acceptable only in addition to these traditional applications?

■■■■■■■■

# 2. METHODOLOGY

This study has been conducted with the main objective of understanding the cord care practices and feasibility of introducing CHX in Banke where CB-MNC program is underway. But because of the CB-MNC program people of Banke district are exposed to the proper cord care practices. Because of this the study instead was implemented in Bardiya- an adjoined district to Banke. The major four caste groups in Banke are Muslims, Tharu, Chhetri and Brahmin Hill (CBS, 2003). Hence this study in Bardiya has been conducted among these four castes so that the results could be generalized for Banke.

This qualitative study is explorative in nature. The below section discuss how the VDCs and respondents were sampled, actual sample size, tools that were used for information gathering, study implementation and study limitations.

### 2.1 Selection of VDCs

The major criterion used for the selection of the VDCs was that it should be well populated by the three of the study caste groups i.e. Hill-Brahmin/Chhetri, Tharu and Muslim. The 2001 Census data served as sampling frame for selection of VDCs. The other criteria used for the selection of the VDCs were distance from district headquarter – Gulariya and preferably not touched by main road or highway; VDCs not adjoined to Banke district and the clusters well spread over. The clusters were selected based on the availability of type of respondents required. Based on these criteria six VDCs viz. Mohamadpur and Rajapur for Muslim caste; Baniyabhar and Motipur for Tharu castes and Pashupatinagar and Sanushree for Hill-Brahmin/Chhetri were selected. Due to shortfall in samples in Pashupatinagar and Sanushree, samples were taken from Taratal, Rajapur, Motipur and Kalika.

### 2.2 Data Collection Methods and Tools

Semi Structure Interviews (SSIs) and Focus Group Discussions (FGDs) were conducted with women of all three caste groups.

The SSIs and FGDs were conducted with four categories of women – Recently Delivered Women (RDW), Grand Mothers (Mother in Laws of RDW), Occupational castes involved in cord cutting and FCHVs serving those castes. RDW were defined as those who had given birth during the past three months preceding the study. SSIs were conducted with all four women groups whereas FGDs were conducted with RDW and GMs.

The tools were first developed by the Principal Investigator with inputs from NFHP Monitoring and Evaluation Team (M&E) and other senior staff of NFHP. Technical Assistance on the tools was also provided by personnel from Johns Hopkins School for Public Health/HARP program. After the tools were finalized in English it was translated into Nepali and was pre tested. The tools covered questions related to background characteristics of the respondents, information on recent birth, understanding about umbilical cord, cord tying and cutting, substance use on the cord, body massage, problems related to cord stump, opinion towards the Chlorhexidine formulation, respondents preference of the product, pricing and naming of the Chlorhexidine formulation.

### 2.3 Selection of Respondents

SSI with RDW: The RDW who delivered a child at home within three months preceding the date of interview were chosen. The other criteria were the child should be alive and the women should be well representative of the study caste group.

SSI with GM: The GM who has a grandchild delivered at home within six months from the date of interview was chosen. The other criteria were the grandchild should be alive and the GM should be well representative of the study caste group.

SSI with Cord Cutting Occupational Groups: The women involved in the cord cutting work and serving families of any one of the study castes of the study VDCs were interviewed. The other criteria were that the women should be able to articulate things irrespective of which caste she belonged to and should be currently doing the same work.

SSI with FCHVs: The FCHV should be from the community where the RDW and the GM were interviewed.

FGD with RDW: The RDW who delivered a child at home within 12 months from the date of interview was included for the FGD.

FGD with GM: The GMs who had a grandchild delivered at home within 12 months from the date of interview was included for the FGDs.

The RDW and GM for FGDs were selected from different clusters with the help of FCHVs.

Also, only one respondent from a household was selected so as to avoid duplication in information collection about the same child. Altogether 45 Semi Structure Interviews and 10 FGDs were conducted (Table1).

**Table 1: Total number of SSIs and FGDs conducted**

| Caste | VDC | SSI | | | | FGD | |
|---|---|---|---|---|---|---|---|
| | | RDW | GM | Occup Group | FCHV | RDW | GM |
| **Muslim** | Mohamadpur | 4 | 3 | 2 | 2 | 1 | 1 |
| | Rajapur | 2 | 2 | 2 | 1 | 1 | 1 |
| **Tharu** | Baniyabhar | 2 | 2 | 2 | 1 | 1 | 1 |
| | Motipur | 2 | 2 | 2 | 1 | 1 | 1 |
| **Brahmin/ Chhetri Hill** | Rajapur | | 1 | 1 | | 0 | 1 |
| | Kalika | 2 | 1 | 2 | 1 | 0 | 0 |
| | Taratal | 2 | 1 | 1 | 1 | 0 | 0 |
| | Motipur | 0 | 0 | 0 | 0 | 1 | 0 |
| **TOTAL** | | **14** | **12** | **12** | **7** | **5** | **5** |

### 2.3 Training of Field Researchers and Field Work

As the study participants were females two female Field Researchers were hired for data collection. These female field researchers had previous experience in qualitative research and were able to speak local languages. A three days training to them was provided by NFHP M&E Team in Banke. During the training, the tools were also pre tested and necessary modifications were made.

The field work of the study was conducted from late November 2006 through early January 2007 and was closely supervised by the NFHP M&E Team. In addition, a de-briefing session was also organized in the field during data collection period.

NFHP Nepalgunj provided necessary logistics support to the study. As a vote of thanks each SSI respondents and FGD participants were provided a small token.

**2. 4 Informed Consent**

Before the conduction of interviews and FGDs all the respondents were told about the purpose of the study and their consent was taken for the interview and for recording their voices.

**2. 5 Data Processing and Analysis**

Information collected through SSIs and FGDs was transcribed, coded, processed manually and analyzed. The filed researchers themselves developed expanded notes. Coding of the notes was done by the PI herself with the help of the field researchers. Under the guidance of the M&E Team leader, the PI herself reviewed the information critically and analyzed it to generate factual information and to draw meaningful conclusion.

**2.6 Limitations of the Study**

During the field work, it became difficult to find adequate number of Hill Brahmin/Chhetri respondents who had delivered at home within three months period in Pashupatinagar and Sanushree. Therefore later Taratal and Kalika VDCs were also visited to meet the required sample size. Brahmin/Chhetri samples were even drawn from Rajapur and Motipur VDCs. The conduction of FGDs among the RDW and GMs of the Brahmin/Chhetri caste became quite difficult for the reason that the cases of home delivery were very scarce among this caste group and that the households with home delivery were scattered widely, making the organization of FGD sessions difficult. Hence, one FGD each with Brahmin/Chhetri RDW and GMs, and one SSI with GM of Brahmin/Chhetri caste could not be conducted.

Initially, FGDs were also planned with cord cutting occupational castes but as their population was found much scattered, only SSIs were conducted with them. Similarly, observation of the neonates was limited to only one neonate as neonate born within seven days during the field work could not be found.

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# 3. FINDINGS

The study was conducted as a qualitative and exploratory one using methods such as SSIs and FGDs with RDW, GMs, Cord Cutting Occupational Castes and FCHVs. Three caste groups viz. Tharu, Muslims and Hill-Brahmin/Chhetri were included in the study to understand the variation in practices related to cord cutting and caring. The following passages present the findings on different aspects of cord cutting practices such as characteristics of the study population; delivery and birth; cord tying and cutting; substance use; problems related to stump of newborn; changes in cord cutting and caring practices and the study participants' opinion towards the chlorhexidine products.

## 3.1 Characteristics of Study Population

This section of the report presents the general characteristics of the study participants – RDW, GM, Cord Cutting Occupational castes and FCHVs. The characteristics presented are their age, literacy, occupation and family type and size and others.

### 3.1.1 Characteristics of the Recently Delivered Women

A total of 14 RDW, four each from Tharu and Brahmin/Chhetri castes and six from Muslim caste group were interviewed. Slightly more than half of the RDW were aged above 25 years and the rest were aged between 17-24 years. The youngest RDW belonged to Tharu caste who was 17 years old and eldest was a Muslim, who was 33 years of age. Agriculture was the major occupation for most (12) of the RDW. Two-thirds of the RDW were living in joint families, most of whom were Muslim and Tharu. Eight of the 14 RDW had 1-2 living children and remaining 7 had more than 3 children. Of the 14 RDW each 5 had most recent child aged less than 1 month and between 2-3 months and four had their recent child between 1-2 months of age. Majority (8 out of 14) of the recent child born to the RDW was male and rest was female.

Five FGDs were conducted with RDW who have had delivered child at home within the past six months preceding the date of interview. Out of the five FGDs, two each were conducted with Tharus and Muslim women and the remaining one with Brahmin/Chhetri women. A total of 40 participants participated in the FGDs with on an average 8 participants in each of the FGD. Age distribution of the RDW who participated in the FGDs showed that slightly more than two-third were aged between 20-29 years. Twenty three percent were less than 19 years of age and the remaining 12% were between 30-39 years of age. Educationally, slightly higher than two third (65%) of the RDW were literates. All of the Brahmin/Chhetri participants and most Tharus were also literate. Above half of the women were involved in doing agriculture and one-fourth were doing labor work. Twelve percent were doing business and 5% were teachers, all of whom were from Brahmin/Chhetri caste. Majority (68%) of the RDW had 1-2 children. Twenty percent had 3-4 children and 12% had more than 5 children.

### 3.1.2 Characteristics of the Grand Mothers

A total of 11 grand mothers were interviewed for the study that included 4 each from Muslim and Tharu castes and 3 from Brahmin/Chhetri caste. Nearly two-third (7) of the respondents was above 50 years of age and others were younger. All the GMs were illiterates. Occupationally, nearly three-fourth was involved in agriculture, followed by work related to *Sudeni* and labor. All

except one were living in a joint family. The size of the family was quite big, 6 out of 11 had 5-9 members, 4 had 10-19 members and 1 had 22 members in her family. Nearly two-thirds had more than 3 grandchildren and rest had less than 2 grand children. The majority (6 out of 11) of the recent grandchild about whose practices on cord care was asked was 4-6 months, followed by 2-4 months (4) and 1-2 months (1). The recent grand children of most (8 out of 11) of the GMs were female and rest were males.

Five FGDs were conducted with Grand mothers who had at least a grand child who was delivered at home within the past 12 months preceding the date of interview. Out of the 5 FGDs two each were from Tharu and Muslim and one from Brahmin/Chhetri castes. A total of 41 GM participated in the FGDs with an average of eight participants in each of FGD. Nearly three fourth of the participants were between 40 to 59 years of age and 22% were above 60 years of age. Few were below forty years of age. All of the FGD participants were illiterates. Majority of the participants (80%) had agriculture as their major occupation and rest 20% were involved in business.

### 3.1.3 Characteristics of the Cord Cutting Occupational Group

Twelve semi structured interviews, four from each caste groups were conducted with the women who were involved in cord cutting of a new born child. Half of these women belonged to Tharu community, three were Brahmin, two were *Dalit* and one was Magar. These women said that they were called by different names in their community such as - S*udeni, Sudeni Bajai, Sudeni Budi*, *Sudeni Kaki*, *Sudeniya mau*, *Sudeniya*. Some were simply called by their name. Those who were also FCHV were called as - *Swayam Seweka Didi* or *Doctorni Kanchhi*. Out of the 12 women who were involved in cord cutting, 4 were FCHVs.

Most of the Sudenis were above 40 years of age. The youngest *Sudeni* was serving in Tharu community and was 32 years of age and the oldest was serving in Muslim community and was aged 61 years. The Sudenis serving in the Brahmin/Chhetri caste were all literates. Except one *Sudeni* serving in Tharu community, all other Sudenis working in Tharu and Muslim community were illiterates. Exactly half of the Sudenis interviewed were Tharu. Tharu Sudenis were dominantly serving Muslim and Tharus but not to the Brahmin/Chhetris. Brahmin/Chhetri Sudenis were found to have served mostly for their castes only. Two Sudenis were *Dalits* (BK and Sunuwar) and one was Magar. Agriculture was the major occupation for a majority of the Sudenis followed by business.

The Sudenis had a long work experience. Most (7 out of 12) were found to have worked for more than 10 years. Some have worked as long as 30 years as sudeni whilst some had started the work just three years before.

### 3.1.4 Characteristics of the Female Community Health Volunteers

Most of the FCHVs interviewed were above 40 years of age. All of the seven FCHVs were literate. Caste distribution of the FCHVs showed that three were Tharus, two were Brahmin/Chhetri and one each was Newar and Muslim. Three of them had worked for 5-10 years; two had worked for less than 5 years and rest for more than 10 years. All of them had received the basic FCHV training. They were also trained on various other subjects such as ARI, CDD, Vitamin A, Malaria, Iron, HIV/AIDS, Polio, family planning, and safe motherhood. However, none of them had received training on birth attendance – *Sudeni* Training.

The tables on the characteristics of study population are attached in Annex-1.

## 3.2 Delivery and Birth

The women whose last child was delivered at home within three months preceding the date of interview and the grand mother whose last grand child was delivered at home within six months period preceding the date of interview were asked about their or their daughter in laws recent delivery.

### 3.2.1 Assistance during Delivery

In rural areas of Nepal, most deliveries take place at home. Hence, the presence of skilled birth attendant during such deliveries is very important for the health of the mother and the newborn baby. Among the study population, there is no practice of using skilled birth attendant for the conduction of delivery at home and mostly the elderly female members like mother in laws, mothers, sisters in law and neighbors and TBAs help women in the conduction of delivery. Families do not make preparations for delivery and birth in advance.

It was found that in all the three study castes, it is a common practice to deliver child at home. The recently delivered women and grand mothers opined that a woman is taken to a hospital for delivery, only if the family members see that there is some kind of complications. At some instances, the reason for not taking women to deliver at hospital is that the labor pain started at night and that there was no-one to take the women to hospital. The Muslim RDW opined that as the hospital is nearby and "Sister"- nurse is living nearby the village, they would call her in no time in case of complication during delivery of baby. One Brahmin RDW said that she was not taken to hospital to deliver her last child because there was no complication and the family members did not want to spend money unnecessarily by taking her to hospital for delivery. The Tharu grand mothers said that since, the families are poor they cannot afford the women to take to hospital to conduct deliveries at normal conditions. Also if the MIL could or is able to help daughter in law in conducting delivery, the family members do not feel the need to take women to health institution for delivery. One Muslim GM said that she did not like the behavior of nurse at hospital and added that they do things forcefully to deliver babies. She said -

> "In Hospital nurses do things forcefully. They give injection prior to starting of labor pain. That is why we do not take women to hospital. Community people did not allow us to take my daughter in law to hospital for delivery."

Given hereunder is a verbatim from one of the Muslim RDW from Mohamadpur VDC, who delivered her last child at home.

> "Everyone in our village delivers at home. Only when there is too much difficulty people go to hospital. My stomach pain started from afternoon. It started to pain heavily from 6 o' clock in the evening and I delivered at 3 o'clock in the morning. I was not taken to hospital because it was already night. Elderly female relative assisted me to deliver because she was used to doing such works. Before giving birth she massaged my back and stomach with oil. After I delivered my child no one touched me! Everyone waited for *Chamarin* to come. *Uparwala Bhagawan* (God) helped to deliver the child easily. There was no difficulty and pain so I delivered at home"

A GM from Brahmin/Chhetri caste explains why her daughter in law's last child was not delivered at health facility as,

> "The grandson was born at MCHW's home. When my daughter in law had labor pain she was taken to "Sister's" (Nurse) house. Sister examined her and told that her delivery time has not come yet. She asked the mother in law to take her back to home and feed her hot soup. We (family members) were taking her back to house in a *ladiya* (bullock cart) but her labor pain started again and so we took her to the MCHW's house which was near by. My grandchild was immediately delivered. MCHW laid plastic and massaged stomach with oil. I holded my daughter in law. After the child was delivered the MCHW cleaned the child and also cut the cord."

Elderly female members of the family, neighbors and TBA, called as *Sudeni* in the communities were found to have assisted RDW during delivery of child in all caste groups. In Tharu community, "Doctor" (AHW) was also called to assist during delivery. A Muslim RDW was assisted by "Sister" (Nurse) during her last delivery. The elderly female family members and neighbors usually massages stomach and back of pregnant women with oil during delivery, while the *Sudeni* and health workers use their hand to help women deliver the child. Some women said that FCHV also helped them during delivery. FCHVs said that family members often call them during the time of delivery where they advise Sudenis to use new and boiled blades or delivery kit and advice mothers about breast feeding and newborn care.

### 3.2.2 Use of Clean Home Delivery Kit (CHDK)

Tetanus and sepsis resulting primarily from unhygienic deliveries and lack of clean birth impediments are the two leading causes of maternal and neonatal deaths and illness in Nepal (Beun HM et al.). To address the problem of unhygienic delivery practices and high perinatal infection in Nepal, Maternal and Child Health Products, Ltd (MCHP) developed a disposable clean delivery kit since 1994. The clean home delivery kit (CHDK) known as *Sutkeri Samagri* in Nepali contains materials such as clean delivery surface (plastic sheet), a clean cutting instrument (blade and plastic disc to cut on), clean ties for the cord (cord ties), and clean hands for birth attendants (soap). It also contains a pictorial instruction sheet to educate users on hand washing, immediate wrapping of the new born, proper tying of the cord, immediate breast feeding, and burial of waste. In Nepal, where deliveries mostly take place at home with the assistance of Sudenis and family members, the use of CHDK is crucial.

The use of CHDK during delivery among the study population was uncommon. Out of 14 RDW interviewed only 3 had used it (2 Tharus and 1 Muslim). In contrast to this, findings from interviews with GM indicated that Tharus and Muslims did not use it while two Brahmin/Chhetri used it. The very few who used the CHDK during the birth of their last child or grand child reasoned that it was used because "Sister" bought and used it or the husband and FCHV bought it for them. The women who were assisted by health workers used the CHDK.

The reasons cited by the most RDW and GMs who did not use the CHDK during the birth of their last child or grandchild were as following:

- ➔ Lack of awareness of the kit,
- ➔ CHDK was not available in the village,
- ➔ TBA did not bring it while coming to home for assistance during delivery,
- ➔ The child was delivered before time so did not have time to buy it,

- ➔ RDW knew about CHDK but did not buy it in advance and while her labor pain started she did not remember to ask someone for buying it.
- ➔ CHDK is costly as it costs about Rs. 25-30 which is difficult to afford for them.
- ➔ Did not felt necessary to buy CHDK as blade and thread are easily available at nominal cost.

Interviews and FGDs with RDW and GMs evidently showed that the women are knowledgeable that new blade and thread are necessary instruments for protection against Tetanus and infection. They also know that washing hands and feet of the person assisting during delivery and cord cutting are important and blade and thread should be boiled before cutting. The other materials that are available in the CHDK such as plastic sheet, plastic coin and soap were not commonly used in the community as women do not consider those as essential for safe delivery and cord cutting. As blade and thread are easily available at low cost and soap almost readily available in every house, people are not interested to pay Rs. 25-30 for CHDK.

Similarly, all Sudenis except one serving in Tharu community were aware about the CHDK. Most of them who knew about the kit had used it before. They were also aware of the materials that are inside the kit like plastic sheet, blade, plastic coin, thread and soap. Some also said that it contains instructions on using the kit properly. They also think that it is very useful to use the CHDK for delivery and cord cutting because the instruments are safe and free from harmful organisms. Similarly, as all the necessary items are already available in a single packet, it will be easier for families that they do not require buying the things separately. One sudeni who knew about the CHDK but had not used it before said that she would have used it if it was made available to her and also added that CHDK was made available to Sudenis many years' back but now a days it has not been made available to them.

Like Sudenis all FCHVs were also knowledgeable about CHDK. FCHVs viewed that many people do not use CHDK because of ignorance about it and the easy availability of blade and thread in the village. However, FCHVs also said that they have been encouraging pregnant women and their families to its use.

## 3.3 Cord Tying and Cutting

Cord is cut to separate newborn from placenta. Since the instruments used to cut cord cuts through the living tissue and vessels that are still connected to the infant's blood stream, it needs to be sterile to avoid infection. For this, the care takers of newborn, especially mother and grand mother should have understanding about the umbilical cord, its function and the type of instruments used while separating the cord from the newborn's body. Questions on understanding of the umbilical cord, process of cord tying and cutting, instruments used, persons involved, disposal of cord were asked to RDW, GMs, Occupational Castes and FCHVs. This section present the details of the process related to cord cutting.

### 3.3.1 Understanding about Umbilical Cord

The umbilical cord is understood by different names such as *Dhonri, Lara and Nal* and the cord stump as *Navi and Dhonr*i. Most RDW and GMs had difficulty in explaining what the umbilical cord of newly born child meant to them, what is its function while the neonate is inside mother's stomach, during delivery and after delivery of neonate. They were astounded and unable to express their understanding when asked about the function of cord and were somewhat annoyed with the question. Many said that they did not know about it. However, some said that the cord

helps child to breathe while inside the mother's stomach; transfers food and nutrients from mother to child and nourishes child while inside mother's stomach. Few said that during the time of delivery cord helps child and placenta *(Purain)* to come out. Almost all women said that after delivery the cord has no function and it should be cut off and thrown away. One Tharu GM said that umbilical cord helps in the discharge of placenta after the delivery of child which also came up in a FGD. Some Muslim women said that *Allaha* (God) made the cord and stump so he knows about its function, not by them. Some women in FGDs said that if there is no cord, the child will not survive; cord helps in the formation of stump and few even said that cord has no function at any stage. Some GMs compared cord to plant and stump to ground. Cord comes out from the stump (stomach) just as plant germinates from ground. There were no caste differences about the understanding of umbilical cord.

Women in the communities do not or rarely discuss about umbilical cord, cord stump, placenta and its functions. Hence, questions on such things make them feel uncomfortable. A Tharu GM angrily replied when she was asked about the function of cord as,

> "Who knows about the function of the cord before it comes out from the body of the mother! Only God knows about its function."

### 3.3.2 Preparation done before Cord Tying and Cutting

SSIs with all type of respondents revealed that washing hands, either with cold or warm water is a very common practice among all of the three study castes, irrespective of whoever cuts the cord. *Sudeni* assist in the conduction of delivery and also cut the cord of the newborn. As cord cutting is done immediately after delivery without much delay, hands are washed only once before assisting in delivery. *Tharuins* and *Chamarins* in Muslim community, who do not assist in delivery but only cut the cord, too wash hands before doing their work. In Brahmin/Chhetri castes, where family members were mostly also involved in cord cutting, hand washing was done. FCHVs added that the Sudenis in addition to washing hands also cut their nails before working.

### 3.3.3 Instruments Used to Tie and Cut Cord and Perceptions about the Instruments

Though CHDK is easily available at local markets, which contains all necessary instruments like ties, blade and plastic disc to tie and cut cord safely, its use is already found too low. Here, findings about the different instruments used to tie and cut cord and the reasons for their use are presented.

Boiled new thread and boiled new blade is almost universally used to tie and cut cord. In all the caste groups' thick white thread *(Batuwa dhago, Bistara banaune dhago, Kaccha dhago, Ujla seto dhago, Moto bateko dhago*) which are commonly used in making blankets and bedding is used to tie cord as it is strong, considered good and easily available. Some RDW even used the thread that was already available in home used for stitching clothes. Because there is a less risk of cutting the delicate skin of neonate if a thick thread is used. Moreover, the knot of thick thread is also strong enough and does not open up. Some said that thread from CHDK should be used because it helps in easy drying of wound and prevents neonate from injury, bristles, bleeding and wound. Those who had used CHDK used the thread and blade from it.

RDW and GMs were aware that unclean, dirty (*gandha dhago*), used/old thread should not be used to tie cord. Therefore, the thread should be boiled before its use. The RDW also said that the use of piece of cloth *(Chirkut)* is also not good as it is not very strong and knot may open out or may break. Thin thread should not be used as it may cut the skin of neonate. Use of plastic thread

may be poisonous to neonate and may cause infection and also knot will not be strong. The use of raw thread (*Kaccha dhago*) can break knot and the stump may bleed. Some of the RDW and Muslim GMs could not tell what types of materials were not good to tie the cord of newborn. Few Tharu GMs said that black and red thread should not be used because they are not considered holy.

One Sudeni serving in Muslim community gave her reason for not using black thread as,

> "I never use black thread to tie the cord. The use of black thread is considered "*asuva*" (unholy). If the cord is tied with black thread, the child may be caught by "*Bhoot*" (Ghost/Spirit) and the child may die."

With regards to the use of type of instruments, like the thread, Sudenis, RDW, GMs and their family members are well aware of the consequences of using old/used blade and other instruments to cut cord. Almost all knew that the use of old and rusted blade, knife, sickle (*aanshi*), old and colorful thread could lead to infection, wound, tetanus and subsequently death of the neonate. However, sometimes due to haste, families also have used old and un-boiled blade to cut cord despite knowing that it could be harmful. The major reason for the wide use of new blade and thread is its easy availability in the local markets.

The reasons for using new blade and thread were that,

- ➔ *Chamarin* asked to bring it,
- ➔ FCHV advised to use it,
- ➔ Husband bought the new blade and thread on his own knowledge,
- ➔ Sister in law and MIL asked to bring it,
- ➔ TBA asked to bring it,
- ➔ To avoid having blisters *(Bhatar)* on the stump,
- ➔ Blade from CHDK was used because it is safe as it is already boiled and packed.

**Table: Instruments considered good and not good to tie and cut cord**

| Good | Reasons |
|---|---|
| **Thick thread** | • Makes strong knot and will not open out<br>• Does not cut the delicate skin of neonate |
| **CHDK ties** | • Helps in easy drying of wound<br>• Prevents child from injury, bristles, bleeding and wound |
| **New Blade, Boiled blade, CHDK** | • Safe |
| **Not Good** | **Reasons** |
| **Dirty and Used/Old thread** | • Causes infection |
| **Piece of cloth** | • Makes week knot and opens up |
| **Thin thread** | • Cuts the newborn's skin |
| **Plastic thread** | • Poisonous, causes infection, makes week knot |
| **Raw thread** | • Makes week knot |
| **Black and red color thread** | • Considered unholy |
| **Old/used blade rusted blade, knife, sickle** | • Causes infection, wound, tetanus and subsequently death |

### 3.3.4 Process of Cord Cutting

Cord cutting of a newborn involves different steps such as preparation for cleanliness, selection of person cutting cord, timing of cord cutting, use of ties and cutting instrument, length of stump left and disposal of the cord. Generally, the Sudenis, whether trained or untrained cut the cord of newborn within half an hour of birth. Various length of the cord stump is left after cutting, but most keep two fingers length. The cut portion of the cord is usually buried on ground. The cord stump, which is left after cutting usually falls within 3-5 days. There are some variations in the process of cord cutting among the castes.

#### *3.3.4.1 Person Cutting Cord*

Cord cutting of a newborn is done immediately after delivery and placenta discharge in presence of females only including the mother. Mostly, in all the caste groups there is a typical occupational caste woman who assists in the conduction of delivery and cut the cord of newborn. They are usually Tharu (*Tharuin)* or Chamars (*Chamarin)* and are popularly called as *Sudeni*. Muslims always call *Tharuin* or *Chamarin* to cut the cord of newborn. Tharus are helped by health workers, FCHVs and Sudenis in cord cutting whereas Brahmin/Chhetri cut cord by the help of their family members (mother in law and RDW) or by the Sudenis.

#### *3.3.4.2 Training on Cutting Cord*

Only 7 of the 12 Sudenis interviewed were trained (*Talim Prapta Sudeni*) on cord cutting and the rest were untrained. One of the Sudeni serving in Brahmin/Chhetri community was a FCHV but not a trained TBA. Out of the 7 trained Sudenis, 6 were trained from district health offices and one was trained from India. The Sudenis had a long experience of working as Sudeni (*pls refer to section 3.3.1 for details).*

Those Sudenis who were trained on cord cutting learned it through training. Of the 5 untrained Sudenis 4 learned the work from their MIL who was herself a *Sudeni* while some of them also learnt it by watching other Sudenis doing the work. One *Sudeni* learned it from her husband who was a health assistant.

Almost all Sudenis said that they were the only person in their family who has been doing the work of cord cutting at present. However, as one of the Sudeni's husbands was a health assistant he also does cord cutting when he goes to assist in delivery but never goes to houses just to cut cord alone.

A Brahmin *Sudeni* serving in Brahmin/Chhetri community shares her experience,

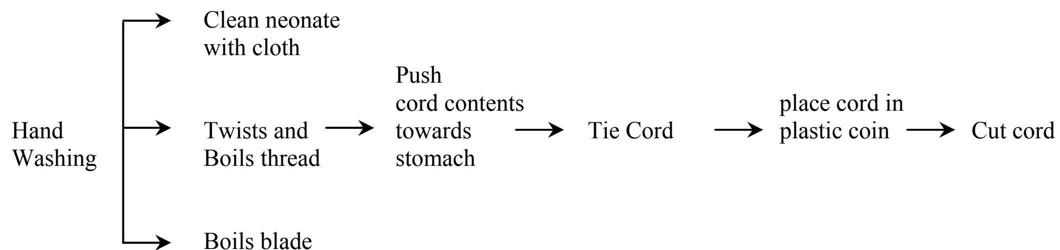
> "I have been doing cord cutting work since 2046. My husband is HA so people call me *Doctorni Kanchhi* and some call me by my name. Though I also do work of *Sudeni* no one calls me *Sudeni*. As my husband is a HA he taught me to do this work. After that I got 15 days training on TBA from HP. If my husband goes to assist during delivery then he cuts the cord also. Otherwise, he does not go to the households for cord cutting alone. I also go to assist during delivery if I am called. I assist to conduct delivery and also cut cord of newborn. I also bathe child but do not wash clothes and massage the child as other *Sudenis* do."

All Sudenis were providing services to families irrespective of religion and caste but one Tharu Sudeni serving in Tharu community said that so far only the Tharu have come to ask for services from her. Mostly the poor, uneducated and ignorant people come to seek services from Sudenis.

Normally, it is the family members who go to call *Sudeni* for cord cutting. But if the *Sudeni* is also a FCHV then during her home visits if she finds a newly born baby she then helps the families instantly.

### *3.3.4.3 Cord Tying and Cutting*

The process of cord tying is same in all the study castes. In Muslim community *Sudeni* cuts the cord. In Tharu community Sudenis and HWs cuts it while in *Brahmin/Chhetri* community *Sudeni* as well as family members cuts it. Firstly, the *Sudeni* washes her hands with water and soap. After that the *Sudeni* cleans/washes neonate with clean cloth, often soaked with mustard oil. The family members are the ones who usually boil blade and thread and make it ready for cutting, although sometimes the *Sudeni* herself boils it. Before boiling, the thread is sometimes twisted to make it stronger. Boiling of blade is more common than boiling of thread. *Sudeni* then ties the cord with thread at 1 to 3 places, most commonly at 3 places, making two folds of thread and two strong knots, leaving a length of about one finger to four fingers. Before tying cord, its contents are pushed towards the stomach. The cord is then placed in a plastic coin from CHDK or in a metal coin *(dhyak, dollar)* itself and cut with the boiled blade. If only one place is tied then the tied place is kept along the body of the neonate and the cord cut. If two places are tied then the cut is made in between the two tied places. If three places are tied, then two tied places towards the stomach are left and cut is made between the second and the third place.




Steps of cord tying and cutting

The RDW and GMs explained that if the cord is not tied before cutting, air enters inside the body of newborn through the stump. As a result the stump swells and also the air inside the body of newborn comes outside through it. Similarly, they also mentioned that if the cord is not tied before cutting, stump will bleed and newborn wounded. Some Tharu GM could not give reasons for tying cord before cutting.

Following is a verbatim from Tharu GM about the process of cord cutting,

> "The cord was cut with old blade and tied with the old thread that was already available in the house. The child was delivered suddenly and there was no one to boil water. So, I tied the cord at a place and cut it……. My son buried the cord at a corner of the room inside the house. The length of the cord I left after cutting was about the length of fore finger. I kept that length because I have seen that length of stump with other children. This is our practice. We do not have practice of

> celebrating after cord cutting. Until the cord falls off, no one touches the person who cuts the cord."

A *Sudeni* serving in Tharu community explains how she cuts the cord of a newborn,

> "I boil blade and thread. I pull the cord (*nal sarne*) and tie the cord tightly and cut it. Then I bathe child with *Khali* (water). If bathed with *khali* the child will not have blisters and injury. When I go to put oil in the morning I untie the knot and again knot it tightly because cord will be drier in the morning than in the night and it will be loose. After I cut the cord I bury it on the yard. The family members of the post partum mother helps in boiling water and dig hole. The family members sprinkle *Sun pani* (Holy water) to me."

A Sudeni serving in Muslim Community tells about the cord cutting process as,

> "These days the *Sudeni* has stopped to bathe child. She applies oil with cloth *(chirkut)* and wipes it. "*Patti and dori*" (blade and thread) is boiled. The sudeni herself brings Sutkeri Samagri (*Barsati*). She pulls cord from placenta towards stump and ties it at three places keeping a distance of a finger between each tied places. She places the cord in the *dollar* (coin) and cuts it. Before tying and cutting the cord she dips them in hot water. Some babies do not move immediately after birth. They move only after the cord is cut. After the cord is cut they cry and become conscious. While doing this people consider me unholy *(Chhutiya maanne*). They do not touch me and give the things I ask by staying at a distance. Whenever the families call me for attending delivery, I myself take the delivery kit with me."

#### *3.3.4.4 Timing of Cord Cutting*

In Muslim community cord is cut only by the *Chamarin* or the *Tharuin*. Religiously, Muslims do not touch the post partum women and the neonate until *Chamarin/Tharuin* cuts the cord. So, the timing of cord cutting among Muslims depends upon the timing of the arrival of *Chamarin/Tharuin.* Generally the timing of cord cutting among them ranges from within 15 minutes of delivery to half an hour. Most cut it within half an hour of birth while some have to wait as long as 2-3 hours to cut the cord as *Chamarin/Tharuin* houses may be far away or they may not be readily available. Tharus and Brahmin/Chhetris cut cord within half an hour of delivery of neonate and discharge of placenta. It may sometime take 1 or 2 hours to cut cord. Since RDW and family members among Brahmin/Chhetri cut the cord it is usually faster than in other castes.

#### *3.3.4.5 Length of the Cord Left after Cutting*

The WHO recommended length of stump left after cutting is 2-3 cm (corresponds to half the length of forefinger) or longer, according to local custom. Cord length left after cutting is locally measured in terms of fingers length and it varied from "two finger lengths" to "four finger lengths". Much variation in keeping the length of cord was seen among the Muslims. Usually the persons cutting the cord uses their own knowledge to estimate the length of the stump.

According to RDW and GMs if the length of cord is left too long it gets stretched, rubbed with clothes and other body parts and will be painful to neonates. A long stump hangs over, swells and gets dirty whereas a too short stump may injure stomach and cause bleeding.

A RDW from Brahmin/Chhetri caste,

> "The length of the cord left was four finger lengths. If the cord is cut too short, the stump infects and there will be depression on the stump *(khalto parne)* and if the length is left too long, stump will be too big afterwards. So four fingers length is the appropriate length to keep."

A Tharu RDW,

> "The length of the cord left was four finger lengths. "Doctor" kept that length. If the length is left four finger lengths, after the cord falls, it could be tied in a sickle and kept in the sleeping place of the child."

#### *3.3.4.6 Disposal of the Cord*

There is some variation in the way cord is disposed among the study castes. The RDW opined that the cord after separation from neonate's body has no use so the cord along with placenta (*purain*) after separation is thrown away. In Muslim community after *Tharuin/Chamarin* cuts the cord, it is either buried with other wastes or separately on the ground yard. Sometimes it is wrapped in a plastic and thrown far away from house. The cord and placenta is considered unholy *(Chhut Lagne)* and also related to family prestige so should be thrown in a place where no one can reach or see.

A Muslim GM,

> "In Muslim community *Tharuni* is called to cut cord. If Muslim cut cord their *Hukka pani* will be stopped and no one will eat the food cooked in their house. After the cord of my grandchild was cut, the *Tharuni*, buried it near the riverside. In our caste, the cord is not buried in the house as it is considered unholy - *Chut lagne*".

Tharus wrap cord and placenta in tree leaf (*Sal Ko Paat)* or in a plate made of leaves *(Tapari)* and bury it on ground inside the room where a neonate is delivered *(Sutkeri ko kotha)* near the door or within the premises-*Aangan.* This work is always performed by the same person who cuts the cord. Tharus also have a practice of spitting on the cord after it is cut but before it is disposed.

A Tharu GM,

> "Since the blade and thread was new the *Sudeni* did not boil it, I myself twisted the thread and made it stronger. I asked to bring the thread and blade from the shop we had. *Sudeni* tied the cord at two places strongly and cut it with blade in between the two tied places. After cutting the cord, the *Sudeni* asked my DIL (mother) to spittle (*thukne*) on the cord. I do not know why the *Sudeni* asks to spittle on it! This is the practice of Tharu community. Both the cord and placenta was kept on a "*tapari*", which I wove it myself. Then the sudeni buried it on the ground inside the room. I don't know why it is buried on the ground? Our forefathers have been doing this and so we also did the same."

A Tharu RDW,

> "After the cord was cut the husband of the RDW dig a hole in the ground and burried it. If the cord is burried in the court yard (*aangan*) there will

> be spacing between the child, i.e, another baby will be born only after 5-6 years. This is what is said in the community and it is the practice."

Among the Brahmin/Chhetris' after cord is cut, female members of the household wrap it in a plastic bag and bury it near by fire place – *agena* or in *aangan* (yard) or in the field. It is believed that if cord is not wrapped in plastic and allowed to come in direct contact with soil while burrying, then the child will vomit. Variation in place of burial of cord was also seen by sex in Brahmin/Chhetri caste. If the neonate is female, her cord is buried in fire place. It is believed that by doing this the girl will always come to home during eating time. If the neonate is a male, then his cord is buried at two places – in *Agena* and in *Chautari*. Burrying cord in *Agena* will allow the boy to come home during feeding time and by burrying in *chautari* will make him a respectable person with opportunity to speak in big gatherings – *Sava* in *Chautari*.

#### *3.3.4.7 Timing of Falling of the Cord Stump and Things Done to it*

The cord stump left over after cutting will fall off after within 3 to 10 days. Most RDW and GM said that the cord of their recent child or grandchild fell off on the fourth or on the fifth day and all think that it was the right time for cord stump to fall.

Practices regarding the things done to the fallen cord stump varied among the study castes. Brahmin/Chhetri store fallen piece of cord in a box. When the child catches cold or have stomach problems then they break the cord into small pieces, mix it with milk and water and give the child to drink, Sometimes if the child vomits or if there is wound or infection around mouth of the child, the child is given to eat the pieces of cord as a treatment. In Tharu community, it is a very common practice to tie the fallen piece of cord in a sickle and keep near the place where the child sleeps (mostly under pillow or bedding). It is believed that by doing so will prevent the child from evil spirit *(Bokshi and Bhoot)*. The Muslims on the other hand bury the fallen piece in any holes or secret places inside the house so that no one can see it.

### 3.3.5 Benefits to the Cord Cutting for Occupational Castes

Families offer different things such as money, cereals, food and clothes to Sudenis after cord is cut. There is some variation by caste in providing this benefit to Sudenis after cord is cut. The cord cutting of a newborn is immediately followed after the delivery of newborn and hence delivery and cord cutting is always counted as a single event and benefits are provided to Sudeni at only once.

In Tharu and Muslim community, different things are offered to Sudenis by families for their services. Tharus give money and cereals to the *Sudeni*. If the neonate is male, then Rs. 50 and 50 kg of rice along with one time meal for 10 days is given. If the child is female, then Rs. 40 and 50 kg of rice and one time meal is given for 9 days when Sudeni comes to massage neonates. On the last day families slaughter cock and feed the *Sudeni*. If it is the first birth in family then the *Sudeni* is also given new clothes and 250 kg of rice. Some families also give Rs. 100-Rs 2000 to *Sudeni* during naming ceremony *(nwaran)* of the neonate.

There is some similarity in the custom of Tharus and Muslim. The Muslim too has the tradition of giving new clothes to *Sudeni*, if the neonate is the first one borne in the family. If the neonate is male the *Sudeni* gets two time food for ten days and if the child is female she gets it for 9 days. Some give one time food and Rs. 50. Until 9 or 10 days, the *Sudeni* comes to the family to massage the neonate. If the newborn is not the first one borne to the family then the *Sudeni* gets 3

plates of cereals -paddy, maize and wheat (*Teen Supo*[1] *anna-Dhan, Makai and Gahun)*. However, all these depend upon the will and ability of family members.

If the cord of Brahmin/Chhetri neonate is cut by someone outside their family then they give some money (Rs 100-150) to that person but there is no practice of giving cereals.

All the Sudenis serving in the three caste groups said that besides getting little monetary benefits and other items such as food and clothes they also get support from community whenever needed. Community also asks for tea and shows their gratitude towards the Sudenis.

A Sudeni serving in Tharu community laughingly says,

> "Some give while others don't. Some give Rs. 50 after cutting the cord. If it is the first child born to the parents they also give a pair of clothes. If the child is not the first one then they gives only a blouse. They give *jaad/rakshi* (liquor) and meat to eat. Even if people cannot give any money they always give something to eat. Nothing else!!"

A Brahmin Sudeni serving in Brahmin/Chhetri community tells about her memorable moment of receiving reward from people,

> "In ward no. 9, placenta of the newly delivered woman did not come out so they came to call me. The mother did not look good. At first I was scared but after the family members requested to help her, I squeezed the mother's stomach and pulled the cord then the placenta came out. I also cut the cord of the child. The father in law of the recently delivered woman was very happy and gave me Rs. 500 as reward. I haven't received other reward beside this. But the families, whom I have served, help me in my household works and also during the time when there is any kind of difficulties in my family."

### 3.3.6 Decision Making About Cord Tying and Cutting

In most instances, it is usually the family members who decide about the person to cut cord. Father in law, mother in law, the RDW herself, and husband decides about it. Sometimes, depending upon the presence of FCHV, TBA or other health workers, the decision is made.

All the GMs said that they were the ones who decided about calling the Sudeni*/Tharuin/Chamarin* or other persons for cord cutting. After *Sudeni* or someone comes to cut cord then the person almost invariably decides about what instruments to use and what things to do which was revealed in the FGDs conducted with GMs of all three castes.

### 3.3.7 Taboos and Celebrations Associated with Cord Cutting

In all three caste groups, there is no special celebration in family after cord is separated from the neonate's body. However, in Muslim community, as cord cutting of the neonate is performed immediately after the birth, cord cutting is usually followed by a typical custom. The Muslims fill *Supa* with paddy, pulses and money. After cord is cut, *Chamarin* bathes/cleans the baby and puts him/her on *Supa*. After that female family members pick up the neonate and the *Chamarin* takes

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[1] a type of big plate made from bark of bamboo, *Nanglo* in Nepali

away cereals and money. Additionally, the family prepares meals, fish and meat and everyone including the *Chamarin* eats it. This is called *Nichwar dine* – meaning keeping away impure things. They also light the Oil Light (*Tel batti*) while doing this.

In Tharu community, after *Sudeni* cuts cord some family members give liquor (*Raksi* and *Jaad*) to *Sudeni*. *Sudeni* is not allowed to touch anything after she cuts cord and also no family members touches her until the newborn's cord stump falls. GMs said that the women cutting cord is not allowed to enter into kitchen and room where the god is worshipped.

There is no such practice among the Brahmin/Chhetri's.

#### 3.3.8 Roles of Families, Communities and FCHVs in Cord Cutting and Caring

The Muslims and Tharus call *Sudeni* to cut cord hence the family members have not much work except bringing the instruments and boiling it while in Brahmin/Chhetri caste, as cord is cut by the RDW herself and by her MIL; all the things are done by the family members. Body massage and application of oil on the stump is also done by *Sudeni* in Tharu and Muslim community over the first week, while in Brahmin/Chhetri community it is done by the family members itself. Family members also go to call the Sudenis.

The community have limited role in cord cutting and caring. During delivery elderly women from neighborhood come to the family and help in massaging the stomach and back of women. They come if there is feast organized to observe birth of the neonate.

The FCHVs' role in cord cutting and caring is important. While most of the things are done by *Sudeni*, FCHV mostly become present during the delivery and advise Sudenis for safety measures. The FCHVs also advise TBAs to use CHDK, educate mothers and pregnant women about safe delivery and cord care of newborn during mother group meetings and also advices on nutrition.

## 3.4 Substance Use

A wide variety of traditional practices and beliefs are associated with care of the umbilical cord and use of substances on the cord stump. In most cultures, topical application of different substances like ash, dung, oil, butter, spice pastes, herbs and mud are common, which are often contaminated with bacteria and spores and increases the chance of infection to the newborn (WHO). In this study, questions related to the application of substances on the cord stump at different timings; opinion towards the substance used and reasons for their use, decision making about the choice of substance, opinion on hot and cold substances and substance used to massage the body of newborn were asked to all the respondents. Additionally, their perceptions towards the use of different substances were also collected, which is presented in the proceeding passages.

#### 3.4.1 Substance used on the Cord

The application of heated mustard oil mixed with different other substances over the cord stump after cutting the cord and over the first week of birth is a very common practice in all the study castes.

#### *3.4.1.1 Immediately After Birth and Before Cord Cutting*

The interviews with Sudenis, RDW and GMs revealed that immediately after the birth, no substance is applied on the stump of the newborn in any of the three castes. Immediately after birth *Sudeni* washes body of the neonate with a soft cloth and advice mothers for keeping the stump dry. However, some mothers and grand mothers do not listen to them and drop mustard oil on the cord immediately after birth.

Similarly, before cord cutting nothing is applied on it. However, a Tharu RDW and a GM said that mustard oil was applied by a FCHV to the stump of their child/grandchild before the cord was cut hoping wound to heal and cord to fall easily.

A Tharu GM tells how and why the *Sudeni* applied oil on the cord before cutting it,

> "*Sudeni* applied mustard oil to the cord and pulled it towards the stomach. If the cord is not pulled (*Sarne*), the stomach becomes bigger. After pulling the cord it was tied and cut."

#### *3.4.1.3 After Cord Cutting*

Cutting of cord takes place within few minutes to hour interval after birth of the baby. While nothing is applied to the cord before cutting it, mustard oil *(Lahi ka tel, Kaduwa tel)* is almost invariably used after the cord is cut. Turmeric, *hing, jwano*, onion and garlic is often mixed with the heated mustard oil and applied on the stump immediately after the cord is cut. The reasons associated with the use of mustard oil is that it has healing property, kills poisons and prevents infection, helps in cord drying and falling and stops bleeding. Tharus apply mustard oil by making rings around the stump with the help of fingers.

There are some variations by caste on the use of mustard oil. Muslims mix turmeric, dry ginger (*sutho*), onion and *pipla* to mustard oil, heat it and apply. The *Tharuin/Chamarin* who cuts the cord applies it to the neonate. Brahmin/Chhetris apply warm mustard oil or the mixture of mustard oil and turmeric only where as Tharus apply mixture of mustard oil with *timur, methi* and *jwano*. Some Tharus also use mixture of ash and mustard oil on the stump on the very day the cord is cut, which is mostly done by *Sudeni* and by family members.

**_Common Use of Mustard Oil_**

From a very long period of time, mustard oil has been extensively used to apply on stump of neonates and to massage body of mother and neonate. Mustard oil is usually heated and mixed with different substances like turmeric, *jwano*, *methi*, dry ginger and applied topically on the neonate's stump. The reasons for the common use of mustard oil are:

- ➔ It heals stump,
- ➔ It helps in falling of cord easily and soon,
- ➔ It makes stump greasy (*Chhiplo*) and soft,
- ➔ It prevents from infection (*ghau pakne*),
- ➔ It dries cord stump and helps in falling off,
- ➔ It prevents child from cold,
- ➔ It keeps body warm,
- ➔ It kills pain It is easily available at home,
- ➔ It is easy to apply. Just warm it and use it,
- ➔ It has been used for a long time in their community

#### *3.4.1.4 Over the First Week of Cord Cutting*

The mixture of mustard oil is continued to be applied on the stump over the first week of cord cutting. The Sudenis working for Tharu and Brahmin/Chhetri Caste said that families use mixture of mustard oil and turmeric on the stump over the first week of birth.

Some Tharus also apply *Sindoor* on the stump in case of infection. Additionally, some Muslims also apply powder and "yellow medicine" on the stump.

There is no notable variation in the frequency of application of the mixture by caste. The application of oil on the stump takes place during body massage of the neonate. The mixture of mustard oil is used 2-5 times daily, mostly 2-3 times. However, if there is infection or other problem on the stump, then application of the mixture could be more frequent.

A Sudeni serving in Tharu community,

> "Most people apply oil. They do not agree to keep it dry. They say that if the cord stump is kept dry, there will be infection and blood flow from it and it will pain the child. Some people agree with her and keep the stump dry. Most uses oil 2-3 times a day until the cord falls. After the cord falls they put oil for 5-6 months more."

Beside mustard oil, the Muslims also use "Nurani oil", "Majidi oil", powder and penicillin on the stump of child. Nurani oil is taken as making neonate's body strong, helping to dry and fall cord and also keeping neonate's body hot. *Dhonri* powder is also used to prevent stump from infection. Using penicillin for several days after the falling of cord is a common practice. Medicine (lotion) and powder from hospital are also considered good to use.

Tharu GMs said that the use of *sindoor* and ash of cow dung (*Kanda ko bhuwa*) is good to apply in case of infection as it heals wound. Tharus and Brahmin/Chhetris did not use other substances on the stump.

A Tharu RDW,

> "In our caste no other thing is considered better than to Mustard oil. This is the practice. Mustard oil is good. It dries wound (stump) and helps in falling of the cord."

The following table shows the variations in the use of different substances on the cord stump and whole body of the newborn at different stages.

**Table: Different substances used on the stump at different timings**

| Substance Used | Muslim | Tharu | Brahmin/Chhetri |
|---|---|---|---|
| **On the cord immediately after birth** | • Mustard oil | • Mustard oil | • Mustard oil |
| **On the Cord Before Cutting** | • Nothing | • Nothing<br>• Some use mustard oil | • Nothing |
| **On the Stump Immediately After Cord Cutting** | • Mustard oil<br>• Mustard oil with dry ginger, *pipla*, turmeric and onion | • Heated mustard oil<br>• Mustard oil with *timur*, *methi* and *jwano*<br>• Nothing | • Warm mustard oil<br>• Mustard oil with turmeric |
| **On the Stump over the First Week of Cord Cutting** | • Mustard oil<br>• Mustard oil with dry ginger, *pipla*, turmeric and onion<br>• Nurani Oil | • Heated mustard oil<br>• Mustard oil with *timur*, *methi and jwano* | • Warm mustard oil<br>• Mustard oil with turmeric<br>• Mustard oil only |

| | | | |
|---|---|---|---|
| | • Powder<br>• Penicillin<br>• Lal tel (Red oil) | • Nothing | • Powder<br>• Nothing |
| **Body Massage** | • Mustard oil mixed with *pipla,* dry ginger, turmeric Nurani oil, *methi, jwano, hing*, onion and garlic | • Mustard oil with *methi*, garlic, *timur* and *jwano* and *kapur* | • Heated Mustard oil only<br>• Mustard oil with *jwano and methi* |

### 3.4.2 Opinion towards the Substance Used on the Freshly Cut Stump

All RDW from all three caste groups were of the view that the application of mustard oil mixed with different other things is good for the freshly cut stump because it is easy to apply-just warm it and use it; it makes the stump greasy (*Chhiplo*) and soft and prevents from infection (*ghau pakne*); it dries the cord stump and helps in falling; it heals wound easily; it prevents child from cold and it kills pain. Some RDW from Muslim community said that "Nurani oil" and "Majidi oil" should be used as it helps in falling of cord quickly. They also said that medicine (lotion) from hospital is also good to use.

Mustard oils with impurities (dirty), coconut oil, Amala oil, *Lal tel* (Red oil) and *Sindoor* should not be used on the freshly cut stump. Some argued that no other substances other than mustard oil should be used, while one Muslim RDW said that the use of mustard oil and *Lal tel* will lead to infection of the stump. Some RDW and most GMs could not say what substances are not good to use on the stump. According to one Brahmin/Chhetri GM application of any oil can lead to infection of the stump.

**Table: Substances considered good and not good to apply on the freshly cut cord and their reasons**

| Substance | Types of substance | Reasons |
|---|---|---|
| **Mustard oil** | Good | • Easy to apply,<br>• Makes stump greasy (*Chhiplo*) and soft,<br>• Prevents from infection (*ghau pakne*),<br>• Dries cord stump and helps in falling,<br>• Heals wound easily,<br>• Prevents from cold and kills pain |
| **Majidi Oil** | Good | • Helps in falling of the cord quickly |
| **Nurani Oil** | Good | • Helps in falling of the cord quickly |
| **Lotion from hospital** | Good | • Medicine is good |
| **Contaminated oils** | Not Good | • Causes Infection |
| **Sindoor** | Not good | • Causes infection |
| **Amala and Coconut oil** | Not Good | • Cold |

### 3.4.3 Hot and Cold Substances

All RDW and GMs from all castes feel that "heat" and "hot" substances are good for neonates. RDW repeatedly mentioned that neonate's body including the stump should be kept warm in order to avoid cold, stomach will not swell and will not get diarrhea. Cold enters inside the body of neonate through stump causing infection and pneumonia. One Muslim RDW said that excessive heat can also lead to infection.

Regarding the ways of keeping neonate hot, everyone un-doubtly said that the neonate should be wrapped properly with dry and warm clothes. Wet clothes and cold clothes like nylon should not be used for wrapping them. Some RDW and GMs also said that body massage of neonate with warm mustard oil is helpful to keep the body hot. Tharu RDW said that it is beneficial to keep child near fire place – *Aago/Taap le sekne*. Tharu GMs in a FGD also mentioned that when hot ash wrapped in cloth piece is put on the stump it makes child hot.

A Tharu RDW:

> "Heating (*sekne*) stump of child is good and necessary. If there is infection in stump, heating it with fire helps in draining of impure blood and drying of the stump. Soaking cloth in hot water, draining it and putting the warm wet cloth on the stump helps to keep the baby warm. People keep the child warm if FCHV tells to do it otherwise people won't do it."

RDW had opinion that the food which mother eats will have effect on the child. A Brahmin/Chhetri woman said that whatever the mother eats that will go to the child. According to her green vegetables are cold and if the mother eats it then the child may catch cold (*Thandi lagne*). GMs said that Amala oil, Neem oil, Sesame oil (*Teel ko tel*) and coconut oil is cold. Pumpkin, radish, gourd etc are also considered cold foods. Foods like pulses (*dal*), fish, meat soup, legumes, *Musuroko dal* and "roti" cooked with dry ginger are considered hot foods for mothers which help the child to keep warm. Muslim RDW said that the use of Nurani oil and Majidi oil will keep the child hot and that Lal oil keeps body cold. Apart from these most RDW from all caste groups said that potato, egg, milk, dry fruits are also the hot foods.

A Muslim GM,

> "Mustard oil is the only hot thing to apply on the stump. Kerosene and Tarpine oil is hot but it cannot be used in stump. Neem oil, coconut oil, Hem Ganga oil, Seasame oil and Dabar oil is cold"

### 3.4.4 Decision Making About Substance Use

The decision to use type of substances on the stump and body massage is mostly done by the MIL or the mother herself. Sometimes S*udeni* also makes such decision. The family usually follows the custom which has been practiced in their family or community for a long time. The elder female family members prepare such substances (mixture of mustard oil with other substances) to use on the mother and on the neonate.

### 3.4.5 Body Massage

The use of Mustard oil to massage body of newborn is universal in all the studied caste groups in Bardiya district. The body massages of neonate takes place along with the massage of mother and the same mixture (oil) is used for mother and neonate. Tharus and Muslims add different other substances with the heated mustard oil while the Brahmin/Chhetris mostly use plain Mustard oil to massage neonate.

Tharus mix *methi, chamsoor* seeds, *hing, jwano*, and sometimes "Lal tel" and "Nurani oil" with the mustard oil. Muslims mix wide variety of substances such as *pipla*, dry ginger (*soth*), turmeric (*Haldi ko bukuwa)*, onion, *methi, jwano, hing, Bozho* and garlic to the heated mustard oil and use

it to massage neonate. Muslims too sometimes mix Nurani oil with the mustard oil. The use of the type of oil also depends upon the season. If the child is born during hot season, *Lal tel* (Red oil) is also used as it is considered to keep child cool. The Muslims prepare the mixture, filter, and store it in a bottle for use. Sometimes, the Brahmin/Chhetris were also found to have added *methi* and *jwano* to the mustard oil.

RDW and GMs emphasized that during winter child should be massaged with hot oil and during summer it is not necessary to massage child with oil.

A Muslim RDW tells about the substance that was used to massage her recent child:

> "Peeper, dry ginger, onion, turmeric and mustard oil mixed with Nurani oil was applied to massage my child. Also a thick turmeric paste was prepared (*Turmeric ko Bukuwa*) by mixing it with dry ginger powder, mustard seeds and mustard oil and was used to massage child's body because it makes body strong. Use of *turmeric bukuwa* also stops the coming of hair in the body parts.

Mustard oil mixture was used to massage neonate's body because it helps baby to grow, relaxes child and helps to sleep, keeps the child warm and prevents from cold and makes child strong. Some Muslim used mustard oil because they could not afford to buy oils like *Lal tel*.

Body massages is done 2-5 times a day over the first week, most do it 2-3 times and is done by *Sudeni* in Muslim and Tharu castes and mostly by female family members in Brahmin/Chhetri castes. After 9 or 10 days in Tharu and Muslim castes too, the family members massage neonate. The body massage of neonate continues until the neonate is 3 to 5 months old but the frequency of massage decreases to 1 to 2 times daily in the later months.

## 3.5 Problems Related to Stump of Newborn and their Treatment

Infection is one of the major causes of neonatal deaths. Contamination of umbilical cord can lead to omphalitis, characterized by pus, abdominal erythema, or swelling. Pathogens can enter the blood stream through the patent vessels of the newly cut cord and lead to rapid demise, even in the absence of overt signs of cord infection. The RDW and GMs were asked about the type of problems related to the stump or skin around the stump that their recent child/grand child had faced.

Most of the neonates did not face any problems. A few Muslim and Tharu RDW explained that there was some problem related to stump such as infection and pus discharge, bleeding and blisters (water filled and pus filled) on skin around stump. The GMs also mentioned similar problems among the neonates in their community and added that bleeding due to moving (*halline*) of cord stump and swelling (*dallo parne, gano aaune, fulne*) of stump is also very common.

A Muslim GM,

> "Children usually get abscess and infection in the stump. If not treated properly it could be dangerous also. In many cases air enters inside from the stump and stump comes out."

GMs and Sudenis mentioned that there will be some problems afterwards if cord is not strongly tied. *Sudeni* had noticed swelling of neonates' stomach due to delayed cord tying and cutting, blackish and bluish marks of blood clot on skin, dryness of skin and also red blisters in their communities. Sometimes if the length of cord stump is long it will be woven around other body parts. If cord gets contact with urine and water it then smells bad.

For treatment, the neonates are usually taken to private clinic or to hospital/health post, where medicines like powder, lotion, injection, penicillin, pills are given and wound bandaged. According to Sudenis whenever there is any problem with the neonate's cord, people consult FCHVs or sudeni, and thereafter go to a health facility. Regarding home treatments all RDW said that there is no home remedies for such stump problems. However, Brahmi/Chhetri said that they use mud from the main gate of their house and powder over the stump. Tharu RDW said that they put *Sindoor* over the stump in case of wound/infection while Tharu GMs said that ash of cow dung (*Kanda ko Bhuwa*), *Sindoor* and powder (whatever is available at home) are used. From the discussion with the RDW, it appears that the use of powder-whether the powder is medicated or not like PONDS is widely used on the stump.

## 3.6 Changes in Cord Cutting and Caring Practices

There has been changes in many practices related to cord caring, the notably ones being in the use of new and boiled blade instead of sickle and knife to cut cord.

The GMs, FCHVs and Sudenis were asked about the changes they have seen and felt in their communities regarding the cord cutting and caring practices. The mainly noted changes at present were on the use of blade instead of sickle and knives and application of no substances on the stump. The following table presents the practices in cord caring practices then and now.

**Table: Changes in cord cutting and caring practices then and now**

| Old Practices | Current Practices |
|---|---|
| • Sickle and knife were used to cut cord | • New blade is used to cut cord |
| • Un-boiled, rusted sickle were used to cut cord | • Boiled new blade is used to cut cord |
| • Old thread was used to tie cord | • New and thick thread is used to tie cord |
| • There was no home delivery kit | • Home delivery kit is available and used |
| • Cord was tied at a place only | • Cord is tied usually at 2-3 places |
| • Child was bathed immediately after birth | • Bathing of child is delayed. |
| • Ash was sprinkled on infected stump | • Ash is not used in infection and health worker is consulted |
| • Oil was applied on stump after cord is cut | • Nothing is applied after cord is cut |
| • Only mustard oil was used on stump | • Different types of oils are used on stump |
| • Cotton (*suti*) thread was used to tie cord | • Thick bedding thread (*dongri*) is used to tie cord |
| • *Sindoor,* dung and mud were applied on stump | • *Sindoor* and mud are not applied on stump |
| • Bathe child immediately after birth | • Wash stump with warm water after birth |
| • No hand washing | • Wash hand with warm water and soap |
| • Ash was sprinkled to dry it immediately after cord cutting | • Nothing is sprinkled to keep cord dry |

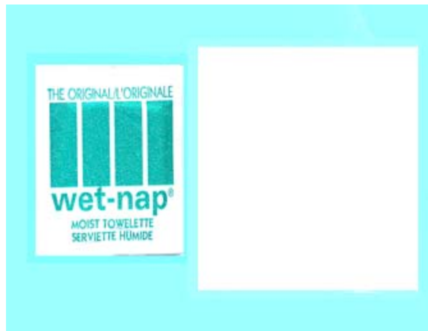
| • Cord was not cut until the delivery of placenta | • Cord is cut even if the placenta is not delivered |
|---|---|
| • *Kuto* and scissor was tied on the cord and hanged up. | • Nothing is tied on the cord and is not hanged |

The level of awareness on different matters related to health has increased in the communities, which has brought about changes in cord caring practices too. The reasons for such changes are the presence of FCHVs at their community who educate mothers and their family members during mother group meetings and home visits. Moreover, trained TBAs and health workers also educate them about safe newborn care practices. In addition, media like-radio and television has also been helpful in creating awareness about cord care practices. Above all, blades and threads are easily availability at villages.

## 3.7 Chlorhexidine

Of the two aspects of the current study, one was to explore the type of chlorhexidine formulation that would be most acceptable by the community people. As there was no real formulation of CHX decided by the time of the study, therefore two proxy products – soaked towelette and lotion were tested to collect opinions of study participants. Both the two products which did not contain the chlorhexidine were packed in similar manner to those that could be possibly supplied in the communities in future. "Wet Nap", a napkin sized white towelette moistened with a lemon scented cleansing lotion was one product tested. Another product tested contained gentle smelling Johnson's baby lotion packed in a small plastic pouch of pink colored. Opinions on chlorhexidine were solicited from RDW and GMs through the FGDs, and from Sudenis and FCHVs through in-depth interviews.

Questions related to the physical structure, easiness to use, things liked and disliked, mode of supply, packaging, willingness to use and pay, and naming of the product were asked to the SSI respondents and FGD participants. Similarly, their preference over the products was also assessed.




***Moistened Towelette***

***Lotion***

### 3.7.1 Opinion towards the Color and Smell of the Towelette and Lotion

The respondents were first shown the two products, told about its use and then each woman was asked to smell and touch the products.

There was no variation in the findings by caste. Many of the FCHVs and Sudenis liked the smell and color and soapy nature of the towelette. Others gave different opinions about the towelette such as – it is good, okay, clear, smell like orange or dettol, is a good medicine to dry wound; has smell that helps in keeping harmful organism away. Most of the Sudenis and FCHVs also liked the color and smell of the lotion. Many of them simply said that the lotion is good. Others said that the lotion smells like cream or rose, looks like soap, is okay, is a good medicine, and that the color and smell is better than that of towelette.

In the FGD sessions conducted with RDW and GM, participants had similar comments as those made by the FCHVs and Sudenis. They said that the towelette smells like dettol, orange or "Balm" and that the color is white, good and bright. Eventually, the women agreed that since the towelette is a medicine it is good to child and hence both the color and smell is also good. On the other hand almost all women agreed that the lotion has very good color and smell. Similarly, women also found the lotion to be having good color and smell (like powder), creamy, smelling far better than the towelette, and oily. They also viewed that the lotion has power of healing wound and looks "hot". While very few women in FGDs commented that the light pink color is not so good.

When asked about what other color and smell would they like the towelette and the lotion to have, most of the Sudenis and FCHVs said that the smell and color of both the products are good therefore requires no changes. However, some suggested making towelette stronger in smell and colorful (yellow or black). Some even wanted it to smell faint. Regarding lotion, many FCHVs and *Sudeni* preferred the color for somewhat darker and stronger in smell. Others preferred lotion to smell like dettol or perfume. Few reasoned that the color should not be darker as dark color may affect the soft skin of neonate. Tharu and Muslim RDW and GMs in FGDs opined that the whiteness and the smell of towelette and the light pink color and smell of the lotion are good. However, the Brahmin/Chhetris RDW and GM remarked that whatever is the color and smell of the products it does not matter them so long as it saves the life of neonates.

**Table: Opinion towards the Physical Properties of Towelette and Lotion (From SSIs with FCHVs and Sudenis)**

| Towelette | | Lotion | |
|---|---|---|---|
| **Color and Smell** | | | |
| Smell is good | ** | Both smell and color is good. | *** |
| White color looks clean and good for the child | ** | Color is light and good | *** |
| Both color and smell is good | ** | It is good | ** |
| It is like Soap | ** | Smells like cream | * |
| It is good | * | Looks like soap so good | * |
| It is okay | * | It is okay | * |
| It smells like orange | * | It is cool | * |
| Good medicine because it dries wound | * | It smells like rose | * |
| It is okay but not as good as lotion | * | Color and smell is better to that of towelette | * |
| Color is clear | * | Smells sweet | * |
| Smell is like dettol so it is good. | * | This is a medicine so it is good | * |
| White color is not good as it gets dirty easily | * | Good it looks like cream | * |
| Smell is okay | * | Light pink color is good | * |
| Its smell will keep away the harmful organisms | * | | |
| Cold | * | | |
| Rough | * | | |
| **Preferred Color and Smell** | | | |
| The color and smell is good/okay | *** | The color and smell is good | *** |
| Smell should be stronger | * | Darker color and stronger smell | ** |
| Should be colorful | * | Light color-Dark color may affect the soft skin of the child. | * |
| Smell should be lighter | * | Should smell like dettol | * |
| Color should be yellow | * | Should smell like scent | * |
| Color should be black | * | Color should be white | * |

Note: ***Cited by at least 5 respondents; ** Cited by 3-4 respondents; and * Cited by 1-2 respondents

### 3.7.2 Opinion towards Easiness to Use Towelette and Lotion

Regarding the easiness to use, most FCHVs and Sudenis commented that the towelette is rough, hard and would be painful to use over neonate's soft skin. In contrast, some also said that towelette is easy to use like towel. During the FGD sessions, some RDW and GM discussed that towelette is easy to use on the freshly cut cord of newborn while others opined that its use will be difficult. Most found the use of towelette more difficult compared to lotion as its texture is somewhat rough and cold. Their argument was that if the towelette is rubbed on the freshly cut stump of neonate, the ties may break out causing pain to neonate. Some argued that towelette would be good to use during summer.

Similarly, lotion was considered very easy to use on the freshly cut stump of neonates by most FCHVs and Sudenis and all GMs and RDW. The reasons for easiness to use were that it could be applied with fingers and cotton. Some also commented that the use of lotion would be difficult as dust and organisms may stick on it and get contaminated.

**Table: Opinion towards the Easiness of Using Towelette and Lotion**
**(From SSI with FCHVs and Sudenis)**

| Towelette | | Lotion | |
|---|---|---|---|
| **Easiness to Use** | | | |
| Very easy | *** | Very easy | *** |
| Could pain the child, difficult to use, rough, cold | *** | Easy to use with fingers/cotton like cream | ** |
| Like water dries easily | * | Difficult to use as can become dirty | * |
| Easy to clean like towel | * | | |

Note: ***Cited by 5 or more than 5 respondents; ** Cited by 3-4 respondents; and * Sited by 1-2 respondents

### 3.7.3 Opinion towards the Appropriate Time and Person to Use Chlorhexidine Products

Majority of the FCHVs and Sudenis said that both towelette and lotion should be used immediately after cord cutting. In their view if the towelette is used immediately after cord cutting it will help to absorb unnecessary blood. Other appropriate timing of using towelette were – after applying oil to neonate; during summer season for keeping body cold; morning and evening; morning, afternoon and at night; immediately after birth; before cord cutting; after falling of cord; while sleeping; and throughout day to cover stump to from flies, dirt and insects. The FGD findings also supported the findings from the interview with FCHVs and *Sudenis*. However, RDW and GMs strongly expressed that the towelette should best be used during summer as the towelette is cold and will keep neonate cool and that it should be used 2-3 times a day. Other appropriate timings to use the lotion are – in the morning, afternoon and night; during body massage; during winter; in the morning and evening; and in the afternoon. The Muslim RDW and GM said that the lotion should be used during winter.

Regarding the appropriate person to use the products on the stump of neonate, there was no variation in the opinion of FCHVs and Sudenis. Majority agreed that both the products could be best used by *Sudeni* followed by mother while the rest said that FCHV, Grandmother and any family member who knows about its use could use it appropriately. The FGD findings too showed that there is no variation in opinion between the RDW and GM about the appropriate person to apply the two products. However, the FGDs with Tharu and Muslim RDW and GMs revealed that grand mother; FCHVs and Sudeni are appropriate persons to apply the products on the stump of neonate while the RDW and GMs of the Brahmin/Chhetri group exclusively said

that it should be applied either by mother or by grandmother. The Muslim RDW and GMs also said that husband's sister (*Fupu*) could also apply it.

**Table: Opinion towards the Appropriate Time and Person to Use Towelette and Lotion (From SSI with FCHVs and Sudenis)**

| Towelette | | Lotion | |
|---|---|---|---|
| **Appropriate time to use** | | | |
| Immediately after cord cutting | ** | Immediately after cord cutting | *** |
| Morning, afternoon and night | | While massaging with oil | * |
| To clean after applying oil | * | During winter | * |
| During summer | * | Morning and evening | * |
| Morning and evening | * | In afternoon | * |
| Before cutting cord | * | Morning, afternoon and night | * |
| Immediately after birth | * | | |
| After falling of cord | * | | |
| Afternoon | * | | |
| Whole day to cover the stump | * | | |
| While sleeping | * | | |
| **Appropriate person to Use** | | | |
| Sudeni | *** | Sudeni | *** |
| Mother | *** | Mother | *** |
| Family members | * | Grand mother and other family members | ** |
| Anyone who knows how to use it | * | FCHVs | * |
| | | Anyone who knows how to use it | * |

Note: ***Cited by more than 5 respondents; ** Cited by 3-4 respondents; and * Sited by 1-2 respondents

### 3.7.4 Product Preference

Findings revealed that the lotion is preferred over the towelette by most of the people because lotion is considered easier to use on the stump, is good, is oily (greasy) therefore makes the stump soft and clean, will have effect for much longer period, spreads over the skin easily, could be used repeatedly, color and smell is better, is hotter than towelette, gets absorbed easily, and has property of healing wound. However, two Sudenis serving in Brahmin/Chhetri and one each serving in Tharu and Muslim castes preferred towelette over lotion because towelette could be easily opened from packet and used, using towelette do not require

***Things Liked about the products***

LOTION-The smell, color, softness, oiliness (greasiness), easy spreading and its easiness to use were the features widely liked by all.

TOWELETTE- Most FCHVs liked the lemon like smell while few also liked its whiteness. Some RDW and GMs liked its usefulness in cleaning; white and watery look and coldness (as will be good during summer).

***Things Disliked about the Products***

LOTION-The FCHVs did not find anything particular about the lotion that they did not like. The Muslim RDW and GM did not like the plastic pouch and wanted the lotion to be packed into a bottle.

TOWELETTE- many *Sudenis* said that there is nothing which they did not like. Few said that they disliked the single use, roughness, water like look and coldness of the towelette. To most FCHVs the most disliked thing about the towelette was its hardness/roughness as it could be painful to child when used directly over the stump. Few disliked its white color, its smell and lack of oiliness. Similarly, some of the RDW and GMs disliked the coldness of the towelette while many said that there is no such thing which they disliked about it. On the other hand except few Muslim RDW and GMs, others said that there is no such thing which they did not like.

direct contact of their hands with the neonate's skin which prevents from risk of getting infection and also because it is like water which makes easy to use. One Tharu GM said that whichever product is given to her she will use it.

### 3.7.5 Preferred Mode of Supply and Packaging of the Chlorhexidine Product

FCHVs followed by Sudenis are considered appropriate person to make the products available to families. Regarding the packaging of the products inside CHDK, many find it as an easy way to supply to families but were also aware that the use of CHDK is not common in communities.

Five of the 12 Sudenis said that both the FCHVs and Sudenis could better supply the products to households as both will have contact with pregnant and RDW. Another five Sudenis said that only FCHVs will be the best person to make available the chlorhexidine product to households because FCHVs are always in contact with the pregnant women and hold mothers group meeting where they can tell about the product and also give away the products to the mothers. Two said that only Sudenis can supply it to the families. On the other hand five of the six FCHVs said that FCHVs would be an appropriate person to make the chlorhexidine product available at the household level. In their view if given to them, they could distribute it similar to iron tablets and every family will get it. One FCHV serving in Tharu caste said that both TBAs and FCHVs could supply it to families. The FGD findings also supported that the FCHVs are better placed to supply the chlorhexidine product to the family level. Some Muslim women also expressed that it will be easier for families to get it from hospital while some Tharu women said that if made available to village *Mukhiya* it will be easier for them to get from him. Few Muslim RDW also said that if the product is given to them people will know about it and use it.

Most Sudenis (10 out of 12) and FCHVs (4 out of 6) suggested packing the chlorhexidine product inside the CHDK so that CHDK will enable the mother to get everything in a single purchase. FCHVs are also aware that the use of CHDK is not very common in the community despite the fact that a single pack will be easier to buy than buying the chlorhexidine separately. The two Sudenis serving in Tharu community and two FCHVs preferred separate packaging (not inside the CHDK) as use of CHDK is not very common.

A *Sudeni* serving in Brahmin/Chhetri caste said,

> "It will be good to package in the delivery kit. But those who cannot buy the delivery kit should be provided chlorhexidine free of cost."

A *Sudeni* Serving in Muslim Community said,

> "*Maja hoi bahut* (It will be good). If the chlorhexidine is packed in the delivery kit it will be very good…… People should be informed about the product. If I am given the product I will tell about it to the villagers. When people know about the product they will use it."

Regarding the addition of the chlorhexidine product into the CHDK, the views of RDW and GMs were varied. Many Tharu GM and RDW and Muslim RDW said that they have not seen the CHDK and opined that it would be better to supply separately. Others said that it would be better if placed inside CHDK. All the Brahmin/Chhetri RDW and GM agreed that it is better to pack inside CHDK.

### 3.7.6 Use of Chlorhexidine Instead of Mustard Oil

It has already been understood that mustard oil, either pure or mixed with different things is the common substance that is used on the cord stump of newborn. Regarding the possibility of families to using the Chlorhexidine products instead of the Mustard oil, Sudeni and FCHVs opined that the use of chlorhexidine on the freshly cut cord stump will be better than the application of home made products (Mustard oil mixture) because the use of medicine prepared especially to care stump will be far better than using oil. One *Sudeni* serving in Brahmin/Chhetri community said that people do not cover oil used on the body of the baby leading to contamination with dirt and harmful organism and ultimately in infection. In contrast chlorhexidine products are sealed therefore safer than the mustard oil. A *Sudeni* serving in Tharu community said that use of chlorhexidine after cutting of cord will also stop bleeding. One FCHV working in Muslim community said that chlorhexidine makes the neonate's stump soft and helps in falling of cord.

Sudenis and FCHVs were willing to use the chlorohexidine by themselves after cutting the cord. They also added that they will recommend mothers and families to use it as well. One FCHV further commented that the product once made available in the village market should be uninterruptedly supplied so that the people will continue to have trust on them.

A *Sudeni* serving in Brahmin/Chhetri Community,

> "Yes, I will suggest others to use it. I will ask families to buy it. Even if the mother will not buy it I myself will buy it and use it on the stump of the child."

A FCHV serving in Tharu community related the supply of product with the people's trust towards them,

> "If it could be supplied continuously, it will be better. If the supply is stopped in between then people will not trust FCHVs and they will stop using it. So, in order for families to use chlorhexidine, it should be supplied uninterrupted."

### 3.7.7 Cost and Willingness to Pay

Almost all respondents of all categories remarked that families will be willing to use the chlorhexidine products on the freshly cut stump of neonate, if made available at the local markets. They opined that mothers and families will be willing to buy and use on the freshly cut cord stump of their neonate as it prevents neonate from getting infection and saves life. Moreover, when people know that it is a medicine produced especially for cord care they will use it in place of oil.

However, two Sudenis said that people will be hesitant paying for it. One FCHV said that the economy of families will decide about its use. However some GMs and RDW further argued that if the product is a beneficial medicine for children then people will buy it irrespective of the price.

Sudenis and FCHVs also stressed that families should be well informed and educated about the wider use of chlorhexidine.

A *Sudeni* serving in Brahmin/Chhetri community,

> "People will hesitate to buy the chlorhexidine. People will prefer using mustard oil and turmeric than paying money for it….People will use it only if it is made available free of cost."

A Muslim GM from FGD,

> "Yes, people will be willing to buy it if it is beneficial. If people know that this medicine has no harmful effect to newly born child, poor as well as rich will be ready to buy and use it."

Cost is the major concern for buying the product. During interview both the Sudenis and FCHVs stressed that it should not be costly. Although we observed different price range among different groups of respondent however mostly it ranged from Rupees one to ten for a single packet. The most preferred price range was Rs four to five. For example most Sudenis and RDW think that the cost of a single packet (with single use) of the chlorhexidine product should be in between Rs 4 to Rs 5, although the price mentioned by them ranged from Rs 1 to Rs. 10 per pouch or packet. FCHVs and GMs also provided similar price range. One *Sudeni* said that people will be willing to buy it even if the cost is Rs. 20. Some GMs said that the packet is big so it should cost between Rs.5 to Rs 10 while some said that the price should depend upon the size of the packet

### 3.7.8 Naming the Product

As most women preferred lotion over the soaked towelette, almost all wanted the lotion to be named as "Lotion for Cord Stump", "Medicine for Cord Stump" and "Lotion for Cord Stump" (*Navi ma Lagaune Malham or dawai or aausadi)*. Some women said that the towelette should be called *Basna aaune rumal or Chiso rumal.*

▪▪▪▪▪▪▪▪

# 4. CONCLUSIONS AND RECOMMENDATION

The study conducted on the cord cutting practices in Bardiya district among Muslims, Tharus and Brahmin/Chhetris have shown that the level of awareness about infection is high and there is healthy practices related to cord and skin care of the neonate. However, the level of the awareness is somewhat lower and practices unsafe among the Muslims. Mostly the Sudenis cut the cord among the Tharus and Muslims and family members among the Brahmin/Chhetris. Not all the Sudenis who cut cord are trained on it. Sill most followed safe practices like using new and boiled thread and blade. The overall use of CHDK is low. Buying of new thread and blade to tie and cut cord is perceived better than buying CHDK because it is less costly. Also, other items of CHDK are not felt necessary by the community.

Application of mustard oil, either pure or mixed with turmeric on the freshly cut cord stump is common among all the castes. This application takes place 2-3 times daily over the first week of birth. Mustard oil is also widely used to massage neonate’s body. People visit government health facilities or private clinics in case of stump and skin problems. FCHVs and Sudenis are also consulted for the problems.

One of the major objectives of the study was to find out whether the women would prefer lotion form of Chlorhexidine or soaked towelette formulation. Most women preferred lotion over the towelette to use on the freshly cut cord stump. Hence, based upon the findings following recommendations is drawn for the introduction of Chlorhexidine and its packaging and supply.

1. **Product Preference:** Lotion seems to be the preferred type of Chlorhexidine formulation for application on the freshly cut cord stump of neonate as it is considered easy to use, spreads easily on the skin, is easily absorbed by the skin and also considered hot Since, mustard oil is applied universally and its color and smell is taken as very good for neonatal skin, it is desirable that Chlorhexidine lotion should have color and smell somewhat similar to mustard oil.

2. **Preferred Mode of Delivery:** FCHVs have regular contact with pregnant and postpartum women through mother group meetings and also during home visits. In Banke under the CBMNC program FCHVs distribute BPP key chains, counsel the pregnant women and also her family members on BPP and distribute Mesoprostrol. Sudeni, and many times FCHVs too assist in delivery and cord cutting. Hence, FCHVs and after that Sudenis are the appropriate channels to supply the product to households. Since, there are also considerable number of people who do not call Sudenis and FCHVs or health workers during delivery, the Chlorhexidine should also be made available at local markets.

3. **Pricing of Product:** Cost is a major concern while launching a new product. As Chlorhexidine is a medicine for preventing from cord infection, people have valued it over the mustard oil and are willing to pay for it. However, the price should be reasonable so that even a poor would be able to buy it. It is recommended that the price of Chlorhexidine lotion should be about rupees 5.

4. **Product Packaging:** For cord cutting some people use CHDK while others buy only blade and thread separately as they consider CHDK costly. Therefore, there is need to

target both groups of people. The Chlorhexidine should be packed inside CHDK to cater the need of the former groups of people so that they will receive a complete package. For those who can not buy CHDK Chlorhexidine product should be made available separately in the local shops.

5. **Frequency of Application:** As the mustard oil is applied 2-3 times daily until 8 to 9 days, the amount of medicine to be contained inside a lotion sachet should be enough to use for a complete care.

6. **Product Promotion:** There should be product promotional messages targeted for the rural communities in order to develop their awareness about the product. This should be carefully designed as so far the message has been not to use any substances on the stump. When included inside the CHDK, it should be also added on the pictorial instruction leaflet.

# 5. REFERENCES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# ANNEX

***Annex-1: Tables on the characteristics of study population***

***Annex-2: Study Instruments***

***2.1 SSI with Recently Delivered Women***

***2.2 SSI with Grand Mothers***

***2.3 SSI with Cord Cutting Occupational Groups***

***2.4 SSI with Female Community Health Volunteers***

***2.5 FGD with Recently Delivered Women***

***2.6 FGD with Grand Mothers***

## Annex-1: Tables on the characteristics of study population

**Table: General Characteristics of RDW of SSI**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| 17-24 yrs | 3 | 1 | 2 | 6 | 43 |
| 25+ | 1 | 5 | 2 | 8 | 57 |
| **Literacy** | | | | | |
| Literate | 2 | 4 | 3 | 9 | 64 |
| Illiterate | 2 | 2 | 1 | 5 | 36 |
| **Occupation** | | | | | |
| Agriculture | 4 | 4 | 3 | 12 | 86 |
| Business | 0 | 1 | 1 | 2 | 14 |
| **Family Type** | | | | | |
| Nuclear | 0 | 2 | 3 | 5 | 36 |
| Joint | 4 | 4 | 1 | 9 | 64 |
| **Family Size** | | | | | |
| <=4 | 0 | 1 | 1 | 2 | 14 |
| 5-6 | 2 | 2 | 3 | 7 | 50 |
| >=7 | 2 | 3 | 0 | 5 | 36 |
| **Number of Children** | | | | | |
| 1-2 | 4 | 2 | 2 | 8 | 57 |
| 3+ | 0 | 4 | 2 | 6 | 43 |
| **Age of the recent child** | | | | | |
| Less than 1 month | 2 | 2 | 1 | 5 | 36 |
| 1-2 months | 1 | 2 | 1 | 4 | 28 |
| 2-3 months | 1 | 2 | 2 | 5 | 36 |
| **Sex of the recent child** | | | | | |
| Male | 3 | 3 | 2 | 8 | 57 |
| Female | 1 | 3 | 2 | 6 | 43 |
| **Total** | **4** | **6** | **4** | **14** | **100** |

**Table: General Characteristics of RDW of FGDs**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| < 19 yrs | 3 | 6 | 0 | 9 | 23 |
| 20-29 yrs | 13 | 5 | 8 | 26 | 65 |
| 30-39 yrs | 0 | 5 | 0 | 5 | 12 |
| **Literacy** | | | | | |
| Literate | 11 | 7 | 8 | 26 | 65 |
| Illiterate | 5 | 9 | 0 | 14 | 35 |
| **Occupation** | | | | | |
| Agriculture | 15 | 3 | 5 | 23 | 58 |
| Business | 0 | 4 | 1 | 5 | 12 |
| Labor | 1 | 9 | 0 | 10 | 25 |
| Teaching | 0 | 0 | 2 | 2 | 5 |
| **Number of Children** | | | | | |
| 1-2 | 14 | 6 | 7 | 27 | 68 |
| 3-4 | 2 | 6 | 0 | 8 | 20 |
| 5+ | 0 | 4 | 1 | 5 | 12 |
| **Total** | **16** | **16** | **8** | **40** | **100** |

**Table: General Characteristics of GMs of SSI**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| <40 yrs | 0 | 1 | 0 | 1 | 9.0 |
| 40-50 | 1 | 0 | 2 | 3 | 27.2 |
| 50+ | 3 | 3 | 1 | 7 | 63.6 |
| **Literacy** | | | | | |
| Literate | 0 | 0 | 0 | 0 | 0 |
| Illiterate | 4 | 4 | 3 | 11 | 100 |
| **Occupation** | | | | | |
| Agriculture | 4 | 1 | 3 | 8 | 72.7 |
| Labor | 0 | 1 | 0 | 1 | 9.0 |
| Sudeni | 0 | 2 | 0 | 2 | 18.1 |
| **Family Type** | | | | | |
| Nuclear | 0 | 0 | 1 | 1 | 9.0 |
| Joint | 4 | 4 | 2 | 10 | 90.9 |
| **Family Size** | | | | | |
| 5-9 | 1 | 3 | 2 | 6 | 54.5 |
| 10-19 | 3 | 0 | 1 | 4 | 36.3 |
| 20+ | 0 | 1 | 0 | 1 | 9.0 |
| **Number of Grand Children** | | | | | |
| 1-2 | 2 | 0 | 2 | 4 | 36.3 |
| 3+ | 2 | 4 | 1 | 7 | 63.6 |
| **Age of the Recent Grand Child** | | | | | |
| 1-2 months | 1 | 0 | 0 | 1 | 9.0 |
| 2-4 months | 2 | 1 | 1 | 4 | 36.3 |
| 4-6 months | 1 | 3 | 2 | 6 | 54.5 |
| Total | | | | | |
| **Sex of the Recent Grand Child** | | | | | |
| Male | 0 | 2 | 1 | 3 | 27.2 |
| Female | 4 | 2 | 2 | 8 | 72.7 |
| **Total** | **4** | **4** | **3** | **11** | **100** |

**Table: General Characteristics of GMs of FGD**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| 30-39 yrs | 0 | 2 | 0 | 2 | 4.8 |
| 40-49 yrs | 5 | 9 | 1 | 15 | 36.5 |
| 50-59 yrs | 8 | 2 | 5 | 15 | 36.5 |
| 60+ | 4 | 3 | 2 | 9 | 21.9 |
| **Literacy** | | | | | |
| Literate | 0 | 0 | 0 | 0 | 0 |
| Illiterate | 17 | 16 | 8 | 41 | 100 |
| **Occupation** | | | | | |
| Agriculture | 17 | 8 | 8 | 33 | 80.4 |
| Business | 0 | 8 | 0 | 8 | 19.5 |
| **Number of Grand Children** | | | | | |
| 1-2 | 9 | 5 | 2 | 16 | 39.0 |
| 3-4 | 6 | 5 | 2 | 13 | 31.7 |
| 5+ | 2 | 6 | 4 | 12 | 29.2 |
| **Total** | **17** | **16** | **8** | **41** | **100** |

**Table: General Characteristics of SSI respondents of Occupational Group**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| <40 yrs | 1 | 0 | 1 | 2 | 16.6 |
| 40-50 | 1 | 1 | 3 | 5 | 41.6 |
| 50+ | 2 | 3 | 0 | 5 | 41.6 |
| **Caste** | | | | | |
| Tharu | 3 | 3 | 0 | 6 | 50.0 |
| Brahmin/Chhetri | 1 | 0 | 2 | 3 | 25.0 |
| Dalit | 0 | 1 | 1 | 2 | 16.6 |
| Magar | 0 | 0 | 1 | 1 | 8.3 |
| **Literacy** | | | | | |
| Literate | 1 | 0 | 4 | 5 | 41.6 |
| Illiterate | 3 | 4 | 0 | 7 | 58.3 |
| **Major Occupation** | | | | | |
| Agriculture | 1 | 3 | 3 | 7 | 58.3 |
| Business | 1 | 0 | 1 | 2 | 16.6 |
| Sudeni | 2 | 1 | 0 | 3 | 25.0 |
| **Family Type** | | | | | |
| Nuclear | 2 | 0 | 2 | 4 | 33.3 |
| Joint | 2 | 4 | 2 | 8 | 66.6 |
| **Family Type** | | | | | |
| < 5 yrs | 1 | 0 | 0 | 1 | 8.3 |
| 5-10 yrs | 2 | 2 | 0 | 4 | 33. 3 |
| >10 years | 1 | 2 | 4 | 7 | 58.3 |
| **Total** | **4** | **4** | **4** | **12** | **100** |

**Table: General Characteristics of FCHVs**

| Characteristics | Tharu | Muslim | Brahmin/Chhetri | Total | |
|---|---|---|---|---|---|
| **Age** | N | N | N | N | % |
| <40 yrs | 1 | 3 | 1 | 2 | 28.5 |
| 40-50 | 1 | 0 | 1 | 5 | 71.4 |
| **Literacy** | | | | | |
| Literate | 2 | 3 | 2 | 7 | 100 |
| **Caste** | | | | | |
| Brahmin/Chhetri | 1 | 1 | 0 | 2 | 28.5 |
| Tharu | 1 | 1 | 1 | 3 | 42.8 |
| Muslim | 0 | 1 | 0 | 1 | 14.2 |
| Newar | 0 | 0 | 1 | 1 | 14.2 |
| **Duration of Work** | | | | | |
| < 5 yrs | 0 | 1 | 1 | 2 | 28.6 |
| 5-10 yrs | 0 | 2 | 1 | 3 | 42.8 |
| 10+ | 2 | 0 | 0 | 2 | 28.6 |
| **Total** | **2** | **3** | **2** | **7** | **100** |