EFFECT ON MODE OF CHILD BIRTH AND ITS OUTCOMES BEFORE AND DURING THE COVID-19 PANDEMIC AT ILAM DISTRICT HOSPITAL: A COMPARATIVE DESCRIPTIVE CROSS-SECTIONAL STUDY

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ABSTRACT

Introduction
Nepal started full lockdown from 24 March to 14 June 2020, followed by partial lockdowns multiple times as a precaution for the prevention of COVID-19 infection. Managing health care services was a major issue during the COVID-19 pandemic for both the patients and health care professionals including services targeting pregnant women in developing countries like Nepal.

Objectives
To study the impact of the COVID-19 pandemic on childbirth services attended at a district government hospital and to observe the impact on mode of delivery and maternal-child health.

Methodology
This descriptive cross-sectional study aimed to find out the impact on delivery services during the pandemic compared to pre-pandemic duration that includes one year period from 22nd October 2019 to 22nd March 2020 (before pandemic) and from 23rd March 2020 to 23rd September 2020 (pandemic duration) at Ilam District Hospital. All the information used in this research was taken from Health Management Information System (HMIS) log book. The permission to use the recorded data was obtained from the hospital. Anonymity and confidentiality of data were maintained and no personal information was used in this research to protect the identity of the patients. The data was collected from the HMIS records of the hospital and was then processed in Microsoft excel.

Results
The result shows despite the lockdown and pandemic the percentage of patients coming to receive delivery services within the hospital increased about 9% which is an exceptionally good result. Emergency CS was found to be decreased by 3%. During the pandemic Hospital stay was significantly reduced for patient’s safety due to COVID-19. However, no adverse impact was observed on the health outcomes of the mother and baby due to a short stay at the hospital.

Conclusion
Despite lockdown and pandemic, the number of parents receiving hospital delivery services increased at Ilam hospital. This was possible due to proper management and pre-plan services according to the government’s COVID-19 protocol to cope with the pandemic and demand of the health services as other nearby hospitals closed their door during the pandemic. In the future, a short stay at the hospital can be continued to cope with a high demand of the services in the maternity department as we found the health of both mother and baby has not been impacted due to short stay in the hospital during the pandemic.

KEY WORDS
Childbirth, COVID-19, Pandemic
INTRODUCTION
The health and wellbeing of women have been hugely impacted due to the pandemic, particularly of the pregnant women who are facing several challenges to receive timely maternal health services from the hospital. This is mainly due to the lack of an adequate transportation system, fear of transmission of the COVID-19 infection. These challenges were highly amplified for those pregnant women who are living in rural/remote areas and for families with poor socioeconomic backgrounds. The low utilization of maternal health services may become a barrier to good outcomes. Although there is a provision of free delivery as a policy implemented by the government of Nepal, pregnant women faced particular challenges and barriers to access maternal health care services. Maternal health is an important aspect in women’s life ranging from phase-wise timing of attendance at routine antenatal (pregnancy care visits, childbirth, and postnatal status) along with the availability of qualified health practitioners, staff, doctor and hospital’s infrastructure.1,2

The world has faced an unprecedented public health crisis due to COVID-19. In Nepal, the first lockdown was imposed from 24th March 2020 to 14th June 2020, which was followed by several lockdowns of short periods as a precaution for the prevention of the spread of infection. COVID-19 stretched the under-resourced health system of low-income and middle-income countries like Nepal, leading to a significant impact on the health system, socioeconomic and cultural structures, and widening healthcare access inequalities especially increasing the burden of adverse birth outcomes of pregnancies. During the pandemic period, the health care system became over-burdened and medical professionals were worried about obstetric quality care for maternal-child health and have the fear that caregivers, such as health professionals might suffer.3,4

The purpose of this study was to compare maternal health services especially hospital delivery services during one year period that included six months pre-pandemic and the first six months of the pandemic period.

METHODOLOGY
This descriptive cross-sectional study was conducted at Ilam District Hospital, the government hospital of Nepal in the mountainous eastern region. Data were taken from the Health Management Information System (HMIS) logbook of one year period from 22nd October 2019 to 22nd March 2020 (before pandemic) and from 23rd March 2020 to 23rd September 2020 (pandemic duration). All the cases of study period were studied. This study was conducted based on the Helsinki declaration. Due to unavailability of institutional review board at the hospital the permission to use the anonymous data was obtained from the hospital administration and all the records of the patients visiting the hospital for the delivery during that time were obtained from HMIS record and taken as sample size by convenient sampling and entered and processed in Microsoft Excel 2013. Personal details of patients have not been used in this research so that the anonymity of the patients can be maintained. The data were then subtracted and reanalyzed by using MS Excel. Descriptive statistics as frequencies and percentages were used to analyze the data.

RESULT
During the total duration of the study, 1,218 deliveries were performed, out of which 582 (426 vaginal delivery and 156 cesarean sections) were during the pre-COVID period. Meanwhile, 636 (474 vaginal deliveries and 162 cesarean sections) were during the first six months of the COVID period.

Table 1: Incidence of delivery

| Mode of delivery | Frequency | Percentage (%) |
|------------------|-----------|----------------|
|                  | Pre-COVID | Pandemic COVID-19 |
| Vaginal delivery | Normal 60  | 10.3            |
|                  | Instrumental 24 | 3.96            |
|                  | Episiotomy 348 | 59.79          |
|                  | Elective 36  | 6.18            |
|                  | Emergency 120 | 20.61           |
| Time of delivery | Day 342    | 58.76           |
|                  | Night 240   | 41.23           |
| Total            | 582        | 636             |

A total of 582 deliveries were performed during the pre-COVID-19 period meanwhile, 636 deliveries were performed in the pandemic COVID-19 period. Most of the deliveries were vaginal delivery with episiotomy during both pre-COVID-19 (59.79%) and pandemic COVID-19 (55.66%).

Table 2: Distribution according to Socio-demographic variables

| Socio-demographic variables | Frequency | Percentage (%) |
|-----------------------------|-----------|----------------|
| Age group                   |           |                |
| 16-20                       | 117       | 22.28          |
| 21-30                       | 366       | 68.29          |
| 31-40                       | 60        | 10.34          |
| >40                         | 24        | 4.22           |
| Residence                   |           |                |
| Ilam                        | 546       | 93.1           |
| Palace/Town                 | 32        | 5.5            |
| Napal                       | 4         | 0.69           |
| Residence                   | 2          | 0.31           |
| Obstetric                   |           |                |
| Primigravida                | 288       | 49.3           |
| Multigravida (>3)           | 276       | 47.27          |
| Grand Multigravida (>3)     | 18        | 3.09           |
| Gestational age             |           |                |
| <37 weeks                   | 35        | 6.18           |
| 37-42 weeks                 | 528       | 86.79          |
| >42 weeks                   | 18        | 3.09           |

Most of the delivering mothers belonged to the 21-30 years age group during both pre-COVID-19 (62.89%) and pandemic COVID-19 period (55.66%). The delivering mothers were mostly from the Ilam district of Eastern Nepal. Most of the deliveries were performed with a gestational age range of 37-42 weeks.

Table 3: Distribution of neonatal weight at birth and APGAR score at 5 minutes

| Neonatal weight         | Pre-COVID | Pandemic-COVID-19 |
|-------------------------|-----------|-------------------|
| Less than 1.5 kg        | Nil       | Nil               |
| 1.5-2.4 kg              | 24        | 30                |
| 2.5-3.9 kg              | 468       | 546               |
| More than 4 kg          | 90        | 60                |

| APGAR score at 5th minute | Pre-COVID | Pandemic-COVID-19 |
|---------------------------|-----------|-------------------|
| less than 4               | 1         | 0                 |
| 4-6                       | 10        | 6                 |
| More than 6               | 571       | 630               |
Most of the neonates weighted in the range of 2-3.9 kgs (468 in pre-COVID-19 and 546 in post-COVID-19 period). Most of the neonates had an APGAR score of more than 6.

The hospital stay for vaginal deliveries during the pandemic COVID-19 period was in the range of 1-3 days while the stay for CS was 4-7 days. On the other hand, hospital stay for vaginal delivery in the pre-COVID-19 period was 1-3 days meanwhile the stay for CS was 5-7 days. Hospital stay depended on the arrangement of transportation and condition of weather but during the pandemic period, patients may stay for a short time due to fear from the transmission of COVID-19 infection.

**Table 4: Distribution of Days of Hospital stay**

| Mode of delivery | Days (mean + range) | Pre-COVID-19 | Pandemic COVID-19 |
|------------------|---------------------|--------------|------------------|
| Vaginal delivery | Normal              | 2.08 (1-3)   | 1.52 (1-2)       |
|                  | Instrumental        | 2.44 (2-3)   | 1.46 (1-3)       |
|                  | Episiotomy          | 2.1 (1-3)    | 1.59 (1-3)       |
| CS               | Elective            | 5.94 (5-7)   | 4.44 (4-6)       |
|                  | Emergency           | 6.22 (5-7)   | 4.38 (4-7)       |

The primary responsibilities of nurses include the admission process, maternal/fetal assessment, and proper clinical care at the bedside. Experienced nursing staff and appropriate nurse-doctor communication can make positive impacts on patterns of delivery modes and outcomes. Care by an experienced nurse during labor can predict delivery mode during the intrapartum period and optimal nurse-doctor communication has a role in decision making about the mode of delivery. Modes of delivery can be influenced by nurses’ knowledge of labor and doctors’ practice patterns.7

In the community normal vaginal delivery is still better for the mother and child while CS and operative vaginal deliveries are associated with risk and such deliveries mode should be only undertaken when indicated. Episiotomy is trauma to the perineum which needs surgical repair and sometimes may have long-term consequences. The long-term consequences of OASIS (obstetric anal sphincter injuries) are much more serious and difficult to manage which requires well-trained and experienced manpower. Several intra partum techniques as perineal massage and warm perineal compress may reduce the risk of OASIS.8,9

In low-income countries, CS may be higher due to delays in assessing referral health facilities. Common indications for CS include maternal conditions (prolonged, obstructed labor, abruptio placenta, hypertensive disorders) and fetal conditions (cephalo-pelvic disproportion, fetal distress, and malpresentation) to name a few.10 COVID-19 lockdown led to restrictions in transportation except for emergency services and thus, reduced health care accessibility, especially for out-patient consultations due to which many patients failed to get routine antenatal checkups. Moreover, they also feared the transmission of disease in hospitals. Some studies showed an increase in maternal mortality.11,12 During the early phase of the pandemic health care providers were also feeling anxiety, insomnia, and depression may be due to inadequate precautionary measures and lack of proper safety equipment in the workplace.13 While maternity services access was limited within Nepal and around the world, it is a very interesting and significant finding that despite the lockdown and pandemic the hospital provided a large number of delivery services in the maternity department, about a 9% increase compared to the pre-pandemic duration. The reason could be women not finding a hospital to go to for maternity health services around the region because many hospitals stopped providing the services and there was a limited transport service. We have noted that daytime delivery occurred very often and increased about 10% during the pandemic. The possible explanation could be the arrival of patients in the morning hours with labor pain and the induction process initiated in the morning hours. This is not a significant outcome as we have noted the majority of the delivery occurred in the daytime even in the pre-pandemic period. Interestingly, the APGAR score at 5 minutes during and before the pandemic was almost the same. That means despite huge constrained health services during the pandemic, properly planned services can have the same or positive impact on the health of the child.

We have seen limited changes in the socio-demographic profile of women who used the delivery services at the...
hospital. Most of the mothers aged 21-30 years during both pre-COVID-19 (62.89%) and pandemic COVID-19 period (55.66%). Most of the women who attended the hospital for the service were from the Ilam district.

Social factors such as low education, limited access to health care, financial dependency and cultural norms can also put women in a lower position in society. COVID-19 impact on health care may be of long term and to avoid or improve health care health personnel should be trained to deal with such situations. Limited health care during this pandemic may have a great impact on the accessibility of health care among women in poor countries. This may affect the mode of delivery and its outcome. Results from a published study of the same hospital during one year period included 1102 deliveries out of which vaginal delivery was 83.93% and CS 14.7%; newborn birth weight between 2.5 to 3.9 kg 80.24%, APGAR of more than 6 in 97.53% of the newborn at 5 minutes; and CS (14.7%). In comparison to the above study, present results of 1218 deliveries in one year period included 582 pre-COVID and 636 deliveries in COVID period, the increase attributed to lack of services in the periphery due to shut down; vaginal deliveries pre-COVID 73% was comparable to COVID period 74% was lower than previous study 83.9%, and CS pre-COVID 27% was similar to COVID period 26%. A slightly shorter duration of hospital stay for vaginal and CS delivery during the COVID period was noted.

CONCLUSION
While maternity services have been significantly impacted during the pandemic within Nepal and around the world, Ilam hospital maintained its services for pregnant women and accepted a large number of admission at maternity units despite the shortage of staff and facilities. The hospital was prepared well to provide the services and to cope with the service demand during the pandemic. Study has concluded that there was no impact on the services at the maternity unit and health outcomes of mother and baby. It was also noted that the percentages of CS in this hospital was slightly lower during the pandemic compared to pre-pandemic records.

LIMITATION OF THE STUDY
Our study was single-centered and the sample size was small, so a larger sample size and multi-center study with longer follow-up are recommended.

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CONFLICT OF INTEREST
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