



Stillbirths In Nepal: A Scoping Review

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ABSTRACT

Stillbirth is the term to describe a foetal demise in utero either prior to, or during the process of labour. It is one of the most burning issues in obstetrics research in recent years. Stillbirth is one of the most heart-wrenching events which can occur unexpectedly during the course of a pregnancy. It causes immense distress to the mother and the health professionals involved. This study aims to explore the incidence, sociodemographic characters, risk factors and obstetrical outcomes related to stillbirths among various studies in Nepal. We searched various electronic databases such as MEDLINE, CINAHL, PubMed, Nepal Journals on-line (NepJOL) and Bangladesh Journals on-line (BanglaJOL) from 2014 to 2021, especially for articles reporting hospital-based stillbirths. We included studies with primary studies on stillbirth conducted in a hospital setting in Nepal and published in English language. The incidence of stillbirths in Nepal varied widely. In this study, the incidence varied from 8 to 23.87 per 1000 births. The majority of stillbirths were preterm, occurring among women aged 20 - 35 years. Many stillborn babies were low birth weight. The categorisation of maternal age and weight of baby, lower limit of gestational week was not similar across the studies. Hypertensive disorders in pregnancy and unexplained factors were the leading risk factors. Limited number of studies available and the lack of uniformity among studies was the main limitation of this review.

Keywords: incidence, risk factors, stillbirths

INTRODUCTION

Stillbirth is the term to describe a foetal demise in utero either prior to, or during the process of labour. It induces unbearable psychological trauma for the mother and the family. "A stillbirth is defined as a baby born with no signs of life after a given threshold, usually related to the gestational age or weight of the baby. Stillbirths are reported inconsistently across countries due to the use of different criteria."¹ Stillbirths can be categorised as 'early gestation stillbirths'(between 22 - 28 weeks) and 'late gestation stillbirths'(at 28 weeks completed gestation).¹ Majority of the developing countries use 28 weeks or more gestation as the thresh

old for stillbirth¹.

Likewise in Nepal, stillbirth is usually considered as a foetal death occurring at ≥ 28 weeks of gestation. Data reveals that the rate of stillbirth in Nepal has decreased by 43.8%, from 31.1 per 1000 births in the year 2000 to 17.5 per 1000 births in 2019¹. Every day nearly 5400 and annually almost 2 million babies are stillborn, worldwide.¹

Disparity among stillbirth rates exists between the countries around the world. It was found that low and lower-middle income countries account for 84% of total stillbirths.¹ The highest rate (32.2 per 1000 total births) of stillbirths has been observed in Sub-Saharan Africa, which is 23 times higher than those observed in New Zealand, Australia and Europe (1.4 per 1000 total births).¹ Likewise, substantial disparities have been observed between low and high income groups (1 in 44 Vs 1 in 355).¹ Globally, the rate has declined from 21.4 per 1000 total births in 2000 to 13.9 per 1000 births in 2019, a reduction of 35% stillbirths.¹ Intrapartum stillbirths is as high as 49% in Sub-Saharan Africa in contrast to only 6% in many developed countries¹. Over 40% of stillbirths occur after the onset of labour - which can be prevented.¹ The quality of intrapartum care is reflected by the rate of intrapartum stillbirths. Higher quality of intrapartum care results in a lower rate of intrapartum stillbirths.

This review aims to explore the incidence, sociodemographic characters, risk factors and obstetrical outcomes related to stillbirths among various studies in Nepal.

METHODS

A scoping review of the published literatures on stillbirth in Nepal was carried out using various electronic databases such as MEDLINE, CINAHL, PubMed, Nepal

Journals on-line (NepJOL) and Bangladesh Journals on-line (BanglaJOL). Databases were searched from 2014 to 2021, especially for articles reporting hospital-based stillbirths. Inclusion criteria were primary studies on stillbirth conducted in a hospital setting in Nepal and published in English language. Study reporting - incidence of stillbirths, maternal characteristics (age, education, ANC status), period of gestation, risk factors for stillbirths, mode of delivery and percentage of preterm births, foetal characteristics (sex, birth weight and condition of the foetus at birth) were included in this review. Medical subject headings (MeSH) terms and keywords for 'stillbirth'; 'stillborn'; 'intrauterine foetal death(IUFD)' was combined with Nepal using Boolean operators (and/or). Titles and abstracts were initially assessed for the eligibility of study by the first author. Full text articles of eligible studies were appraised by two authors, and relevant data were extracted and analyzed.

RESULTS

A total of 852 articles were found and twelve eligible articles are included in this study.

Incidence of stillbirth

The rate of stillbirth from selected studies reported that the incidence of stillbirth varied from the lowest 8 per 1000 births to highest 23.87 per 1000 births.²⁻¹³ The study conducted by Sharma et al² reported that the rate of stillbirth was 15 per 1000 births. However, the rate was found to be 1.79% in the study conducted by Tamrakar et al.⁴ Similarly, the rate of stillbirth was 14.83 and 22 per 1000 births in the studies carried out by Thakur et al⁶ and Shrestha et al⁷ respectively. The incidence of stillbirth was found to be 17.6 per 1000 deliveries in the

study carried out by KC et al.⁸ The rate of antepartum stillbirth was found to be 13.6 per 1000 births in the study conducted by KC et al.¹⁰ Likewise, the rate of stillbirth was found to be 11.24 per 1000 births in a study conducted by Shrestha et al.¹² [Table-1]

et al⁷ and Sindan et al¹¹ have also considered 28 weeks gestation for stillbirths.

Maternal age

In this review, majority of stillbirths were observed in mothers aged 20 – 35 years.

Table-1: Incidence (Rate) of Stillbirths reported by selected studies

Authors & Year	Rate of Stillbirths	Study site
Sharma et al (2021) ²	15 per 1000 births	Chitwan Medical College, Teaching Hospital, Bharatpur
Kuikel et al (2021) ³	8 per 1000 births	TU, Teaching Hospital (TUTH) Kathmandu
Tamrakar et al (2020) ⁴	17.87 per 1000 births (1.79%)	Kathmandu University Hospital Dhulikhel
Sinha et al (2019) ⁵	23.87 per 1000 births	Nepalgunj Medical College, Koholpur
Thakur et al (2019) ⁶	14.83 per 1000 births	BPKoirala Institute of Health Sciences Dharan (BPKIHS)
Shrestha et al (2018) ⁷	22 per 1000 births	Manipal Teaching Hospital, Pokhara
KC et al (2016) ⁸	17.6 per 1000 births (Intrapartum stillbirth rate, 5.3 per 1000 births)	Paropakar Maternity and Women's Hospital, Kathmandu
Duwa et al (2019) ⁹	8.21 per 1000 births	Kist Medical College Teaching Hospital, Kathmandu
K C et al. (2015) ¹⁰	13.6 per 1000 births (antepartum stillbirth rate)	Paropakar Maternity and Women's Hospital Kathmandu
Sindan et al (2019) ¹¹	23.56 per 1000 births	Karnali Academy of Health Sciences (KAHS) Jumla
Shrestha et al (2018) ¹²	11.24 per 1000 births	Patan Hospital
Basaula et al (2021) ¹³	11.70 per 1000 births	Bharatpur Hospital, Chitwan

Gestational week and stillbirth

In this review 50% of the studies included a gestational age of 22 weeks and another 50% included 28 weeks. Studies conducted by Sharma et al², KC et al^{8,10} and Duwa et al⁹ have considered 22 weeks gestation for stillbirth in their study. Likewise, Shrestha et al¹² and Basaula et al¹³ also considered 22 weeks gestation for stillbirths. On the other hand, in the studies conducted by Kuikel et al³, Tamrakar et al⁴ and Sinha et al⁵ 28 weeks' gestation have been considered for stillbirths. Similarly, Thakur et al⁶, Shrestha

In the study conducted by Sharma et al² 67.1% of mothers with stillbirths were aged between 21 – 30 years. However, in the studies conducted by Kuikel et al³, Sinha et al⁵ and Thakur et al⁶ the most frequently observed age group for stillbirth was 20 – 35 years with the incidence of 71.7%, 78.4% and 84.2%, respectively. In studies conducted by Shrestha et al⁷ and Shrestha et al¹² 86% and 82.9% cases of stillbirths also belonged to mothers aged between 20 – 35 years old. In two studies conducted by KC et al^{8,10} 25% and 18.6% cases of stillbirths

belonged to mothers aged <20 years old. Increasing maternal age is associated with increasing chance of stillbirth.¹⁰

Maternal education

Maternal education was reported in most of the studies. Studies conducted by Sharma et al² and Thakur et al⁶ reported that 64.6% and 32.2% mothers were illiterate respectively. In the other hand, the study carried out by Sinha et al⁵ reported that 84.6% mothers were literate. Similarly, in two studies carried out by KC et al^{8,10} reported that many mothers (83.5% and 87.5%) were educated with at least 6 or more years of school education. Likewise, Shrestha et al⁷ reported that 63% of mothers received either primary or secondary level of education. Similarly, Kuikel et al³ reported that only 13% of mothers were illiterate who had a stillborn baby.

Table-2: Stillbirths and Preterm Births

Study & Year	Stillbirths	Preterm Stillbirths (%)
Sharma et al 2021 ²	79	63.3%
Kuikel et al 2021 ³	46	69.6%
Tamrakar et al 2020 ⁴	105	57.1%
Sinha et al 2019 ⁵	65	63.07%
Thakur et al. 2019 ⁶	152	53.3%
Shrestha et al 2018 ⁷	100	65%
KC et al 2016 ⁸	-	54.4%
Duwa et al 2019 ⁹	9	88.8%
Shrestha et al 2018 ¹²	262	81.3%

Uptake of antenatal care (ANC)

The review found that up-take of antenatal check-up by women having a stillbirth is varied. The study conducted by Sharma et al² reported that 49.4% mothers have ANC check-ups at least once. Likewise, 58.7% and

58.5% mothers had ANC check-ups one or more times reported by Kuikel et al³ and Sinha et al⁵ respectively. The study carried out by Shrestha et al¹² reported 46.12% mothers with stillbirths had their ANC. However, another study conducted by Shrestha et al⁷ reported 91% of mothers with stillbirth had ANC visits. Similarly, KC et al. reported that 58.1%⁸ and 60.3%¹⁰ mothers who had stillborn babies had at least one ANC. Lack of ANC is associated with increased risk of stillbirth.^{8,10}

Preterm birth

Preterm birth is found to be associated with stillbirth.⁸

The majority of stillbirths have occurred preterm (prior to completion of 37 weeks). In the study conducted by Sharma et al 63.3% of stillbirths were delivered before 36 weeks, 43% before 30 weeks and the remaining 20% of preterm stillbirths between 31 to 35 weeks. In a study done by Kuikel et al³ 69.6% stillbirths were preterm, whereas only 30.4% cases completed 37 weeks' gestation. Similarly, 57.1%, 63.07% and 53.3% stillbirths were preterm in the studies conducted by Tamrakar et al⁴, Sinha et al⁵ and Thakur et al⁶ respectively. Likewise, in the studies carried out by Shrestha et al⁷, KC et al⁸, Duwa et al⁹ and Shrestha et al¹² the incidence of preterm stillbirths was 65%, 54.4%, 88.8% and 81.3% respectively. These studies reveal that stillbirth rate is more frequently observed in preterm deliveries. [Table2]

Birth weight

Low birth weight is associated with stillbirth.¹⁰

In the study by Sharma et al² 43% of stillbirths were found to be low birth weight (upto 2000 gms), only 36.7% had normal birth weight, and 13.9% were born less than 1000 gms. Likewise, in the study by Kuikel et al³, 52.2% of stillbirths were found to be

Table-4: Risk Factors for Stillbirth

Study & Year	Risk Factors for Stillbirths				
	Unidentified, Unexplained	Hypertensive Disorders	Placental Factors	Cord Related Factors	Congenital Anomalies
Sharma et al. 2021 ²	31.65	29.1%	–	5.1%	–
Kuikel et al. 2021 ³	26.1%	30.5%	10.8%	17.4%	8.7%
Sinha et al. 2019 ⁵	17%	36.92%	13.3%	12.4%	3.08%
Thakur et al. 2019 ⁶	26.31%	19.73%	15.78%	2.63%	–
Shrestha et al. 2018 ⁷	16%	14%	7%	1%	15%
KC et al. 2016 ⁸	-	11%	13.2%	-	-
KCet al. 2015 ¹⁰	-	13.7%	11.7%	-	-
Sidan et al. 2019 ¹¹	40.62%	–	9.37%	9.37%	9.37%
Shrestha et al. ¹² 2018	16.41%	12.61%	6.5%	–	9.92%

low birth weight, 30.4% were between 2000-3000g; and 26.1% were <1000g. In the study done by Sinha et al⁵ 67.69% of stillbirths were low birth weight. In the study conducted by Thakur et al⁶, 44.07% of stillbirths were low birth weight, 19.73%

were normal weight (>3000 gms) and only 6.57% were <1000 gms. In the study by Shrestha et al⁷, 76% were low birth weight,

weight (>2500 gms). In the study by Shrestha et al¹², 87.40% were found to be low birth weight, 12.60% were normal weight (>2500 gms) and 32.82% were found to be <1000 gms. Overall, it is found that many stillbirths were born with low birth weight. [Table-3]

Risk factors

Antepartum haemorrhage (APH) and maternal hypertension are associated with

Table-3: Foetal Birth Weight

Study & Year	Foetal Birth Weight in grams				
	<1000	1000-2000	2000-3000	LBW	Normal
Sharma et al 2021 ²	13.9%	29.1%	20.3%	43% (upto 2000)	36.7%
Kuikel et al 2021 ³	26.1%	26.1%	30.4%	52.2% (upto 2000)	–
Sinha et al 2019 ⁵	-	-	-	67.69%	32.3%
Thakur et al 2019 ⁶	6.57%	37.5%	34.81%	44.07% (upto 2000)	19.73% (>3000)
Shrestha et al 2018 ⁷	6%	–	–	76% (upto 2500)	24% (>2500)
Sidan et al 2019 ¹¹	-	–	–	67.74% (upto 2500)	34.37% (>2500)
Shrestha et al 2018 ¹²	32.82%	–	–	87.40% (upto 2500)	12.60% (> 2500)

and 6% were <1000 gms. In the study by Sidan et al¹¹, 67.74% of stillbirths were low birth weight and 34.37% were normal birth

increased risk of stillbirth.^{8,10}
Among frequently observed risk factors, most common were hypertensive disorders,

placental factors (including placenta praevia, abruptio placenta and APH), factors related to umbilical cord and congenital foetal anomalies. In many studies, unidentified or unexplained risk factors were also observed in 16% to 40% of cases. Other risk factors mentioned in selected studies were malpresentation, oligohydramnios, maternal infection, prematurity, IUGR etc. In some studies, cases of uterine rupture have also been reported as the cause of stillbirths. [Table-4]

Table-5: Mode of Delivery

Study	Vaginal	CS	Others
Sharma et al ²	94.9%	5%	-
Tamrakar et al ⁴	86.7%	-	-
Thakur et al ⁶	82.2%	13.8%	3.9% (lap)
KC et al ⁸	67.6%	32.4%	-
Duwa et al ⁹	65%	35%	-
Sindan et al ¹¹	87.1%	11.52%	-
Shrestha et al ¹²	77.48%	12.22%	9.54%

CS: Cesarean Section, Others: Instrumental, Breech, Laparotomy

Mode of delivery

The majority of stillbirths were born with vaginal delivery. The highest number of vaginal delivery was observed in the study

Table-6: Sex of the Stillborn Foetuses

Study	Male	Female
Sharma et al. ²	57%	43%
Kuikel et al. ³	63%	37%
Tamrakar et al ⁴	54.3%	45.7%
Sinha et al. ⁵	63.07%	36.93%
Thakur et al. ⁶	62.5%	37.5%
Shrestha et al. ⁷	68%	32%
KC et al. ⁸	61.8%	-
KCet al. ¹⁰	55.7%	-
Shrestha et al. ¹²	59.54%	-

conducted by Sharma et al² (94.9%) followed by Sindan et al¹¹ (87.1%). It is shown that, in the study carried out by Thakur et al⁶, laparotomy was performed in 3.9% cases of stillbirths; however, in few other studies, cases of uterine rupture have also been mentioned. The highest number of caesarean sections (35%) was performed in the study conducted by Duwa et al⁹ followed by KC et al⁸ (32.4%). [Table-5]

Sex and the condition of the stillborn babies

The majority of stillborn babies were male. [Table-6]

Three studies have mentioned the condition of stillborn foetuses at birth. In the studies conducted by Sharma et al², Shrestha et al¹² and Basaula et al¹³ 58.2%, 81.3% and 82 % of foetuses were macerated, respectively. The remaining 41.8%, 18.7% and 18% of the foetuses were fresh stillbirths in the same studies respectively.

DISCUSSION

The review revealed the rate of stillbirths between 8–23.87 per 1000 births; significantly lower rate of 8–8.21 per 1000 births has been reported in two studies.^{3,9} Similar rate of stillbirth reported by many studies. The incidence of stillbirth was 19.6 per 1000 births in the study conducted by Mufti et al in Kasmir.¹⁴ The rate of stillbirth was found to be 20.4 per 1000 births in a study carried out by Halim et al. in Bangladesh.¹⁵ An incidence of 16 per 1000 births was found in the study conducted by Alsammani et al in Sudan.¹⁶ However, a review carried out by Poudel et al¹⁷ found a pooled rate of 25.15 per 1000 births which is comparatively higher than the rate of stillbirth in this review. Moreover, the study conducted by Adjetey et al¹⁸ carried out in Cape Coast, Ghana found the stillbirth rate as high as 58.5 per 1000 deliveries.

In this review 50% studies included a gestational age of 22 weeks and 50% included 28 weeks. The study conducted by Alsammani et al in Sudan included a gestational age of 24 completed weeks.¹⁶ Other studies conducted by Goldenberg et al¹⁹ and by Wood and Tang²⁰ included a gestational age of 20 completed weeks. Evidence showed 73.5% of stillbirths at or more than 28 weeks were possibly avoidable¹⁹, however, intrapartum stillbirths could be more challenging to prevent.²⁰

The review found that many stillbirths occurred in women aged 20-35 years. The finding is supported by other studies. The studies conducted by Mufti et al¹⁴ found that 67.1% women aged 21-30 years had stillborn baby. Similarly, Adjetey et al¹⁸ reported that 74.7% women between the age 20-35 years had a stillbirth. However, 33.9% stillbirth was found in the age group 16-20 years in a study conducted by Jamal et al. in India.²¹

In this review, the majority of stillbirths were seen among preterm deliveries. Similarly in the study conducted by Yeasmin et al²² 52.7% of stillborn were preterm, whereas 72.6% cases were preterm in the study conducted by Mufti et al¹⁴, among them 39% were between 28-32 weeks of gestation. A review study highlighted the significant association between premature labour and stillbirth.¹⁷ Low education of women and lack of ANC can increase the chance of stillbirth. Many studies revealed that stillbirth is more common among women who did not attend ANC. The finding is comparable with other studies. The studies conducted by Yeasmin et al (59%)²², Mufti et al (58.9%)¹⁴ and Jamal et al (66%)²¹ shows majority of women lacked ANC visits.

Unexplained/unidentified factors and hypertensive disorders in pregnancy were the leading risk factors followed by placental

factors and cord accidents in this study. Similarly, maternal hypertension and related complications were observed in studies carried out by Goldenberg et al (50.2%)¹⁹, Yeasmin et al (45.2%)²², Halim et al (15.2%)¹⁵ and Patel et al (33.7%).²³ Likewise, antepartum haemorrhage (APH) was found as the risk factor of stillbirth in 31.4% (Goldenberg et al)¹⁹, 8.5% (Yeasmin et al)²², 30.3% (Tesema et al)²⁴ and 13.7% (Halim et al)¹⁵ women who had a stillbirth. However, unexplained/unidentified factors were observed in 24.5% women with stillbirths in the study conducted by Yeasmin et al²², 21.5% cases in the study by Jamal et al²¹ and in 20% cases of stillbirths in the study by Alsammani et al.¹⁶

Vaginal delivery was the principal mode of delivery and caesarean section was also found from 5–35%. Similarly, vaginal delivery was observed in 86.2% and 91.2% in the studies conducted by Yeasmin et al²² and Patel et al²³ respectively. The majority stillborn baby were male and had low birth weight.

CONCLUSION

The incidence of stillbirth in Nepal varies from 8 to 23.87 per 1000 births. Majority of stillbirths were preterm and low birth weight, seen among mothers of age 20-35 years. Unexplained factors and hypertensive disorders in pregnancy were the leading risk factors. Majority of stillborn babies were male and vaginal delivery was the main mode of delivery. Majority of stillbirths can be prevented with regular antenatal check-ups, early detection of risk factors and on-time intervention of complications together with quality maternity service during delivery. Access to quality ANC and delivery care could be the prime strategy to prevent stillbirth. Uniformity in defining and reporting stillbirths is necessary to explore

the true burden of stillbirths across the country. With the adequate investment on maternity care, education and production of skilled human resources, Nepal will undoubtedly achieve the goal of reducing stillbirth rate to as low as 12 per 1000 births or less by 2030.

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