



Factors Associated with Knowledge of Congenital Anomalies Among Pregnant Women in Nepal

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Abstract

Background: Congenital anomalies, also known as birth defects, refer to structural or functional abnormalities present at birth. These conditions include anatomical deformities, metabolic disorders, and physiological defects that can lead to life-threatening complications, long-term disabilities, and significant physical, social, and cognitive challenges (WHO, 2024). Birth defects are a leading cause of neonatal mortality and stillbirths globally, with a higher burden in low- and middle-income countries, including Nepal. Despite their severe consequences, many pregnant women lack adequate knowledge about congenital anomalies, their risk factors, and preventive measures.



Methods: A cross-sectional descriptive study was conducted to assess the knowledge level regarding congenital anomalies and associated factors among pregnant women attending the Antenatal Outpatient Department of Paropakar Maternity & Women's Hospital, Thapathali, Kathmandu. Using a non-probability purposive sampling technique, 167 pregnant women were enrolled. Data was collected through a semi-structured questionnaire developed based on research objectives, literature review, and expert consultation.

Results: The study revealed significant gaps in knowledge among pregnant women. Only 11% had good knowledge about congenital anomalies, while 49% demonstrated poor understanding. The remaining 40% had moderate knowledge. A chi-square test was performed, yielding a p-value of 0.15, indicating no significant statistical association between variables.

Conclusion: The findings highlight that most pregnant women in the study had poor knowledge about congenital anomalies. To address this gap, targeted health education programs during antenatal visits and awareness campaigns through mass media are essential. Improving maternal knowledge can contribute to early prevention, better pregnancy outcomes, and a reduction in the prevalence and incidence of congenital anomalies in Nepal.

Keywords: Anomalies, Congenital, factors, knowledge

Introduction

Congenital anomalies or birth defects refer to structural or functional abnormalities of the body present during birth. They involve conditions associated with metabolic disorders and can lead to direct health complications (WHO, 2024). Birth defects are a significant reason for neonatal death and stillbirth all over the world, with the condition being higher in low- and middle-income countries. Newborns with the condition can experience life-threatening conditions, lifelong disabilities, and severe physical, social, and intellectual challenges (Mohamed, 2024). Among the most common of all the chromosomal disorders is Down syndrome (DS), characterized by typical facial characteristics, retarded growth, intellectual disabilities, and associated congenital anomalies (Bajagain, Shah & Shrestha, 2023). Severity of DS is estimated during prenatal screening as a combination of serologic and ultrasound tests, confirmed with invasive genetic testing. But in Nepal, these diagnostic facilities are available in some private hospitals alone and are predominantly restricted to high-risk pregnancies alone, although according to international practice, all pregnant women should be screened universally (Gurung et al., 2022).

Globally, birth defects affect 2–3% of infants annually and are responsible for over half a million deaths a year. The surviving infants can require multiple courses of medical treatment and hospitalization due to associated medical conditions. The etiologies of congenital anomalies are multifactorial in nature, e.g., genetic, risk factors in the mother, environment, and others such as drug use, low socioeconomic status, and stress—accounting for 40–60% of all abnormalities (Nour Eldin Youssef et al., 2017).

Evidence has indicated that CNS malformations occur most frequently in women who have multiple pregnancies, with a higher number of incidents than during first or second



pregnancies. Other risk factors include teenage pregnancy, low literacy level, poor economic status, high-risk pregnancy, preterm birth, and inadequate diet of the mother (Kanchana & Youhasan, 2018). Down syndrome, the most common genetic condition leading to intellectual disability, is also associated with a range of medical complications, including congenital heart disease, neurological deficit, visual and auditory abnormalities, thyroid dysfunction, and gastrointestinal malformations (Bull & the Committee on Genetics, 2011). The American College of Obstetrics and Gynecology has since 2007 recommended DS screening for all pregnant women to enable early detection and management (Wilson et al., 2013).

This highlights the critical importance of increased prenatal education, easily accessible screening, and healthcare care in order to minimize the impact of congenital anomalies, particularly in low-resource settings.

Objectives of the study

General objectives

To find out the knowledge regarding congenital anomalies and its associated factors of pregnant woman.

Specific objectives

- To find out the level of knowledge regarding congenital anomalies and its associated factors of pregnant woman.
- To identify the association between the knowledge on congenital anomalies and selected socio-demographic variables among pregnant women.

Review of Literature:

Down syndrome (DS) is a congenital disorder that causes intellectual and physical disabilities, yet knowledge about its screening and management is limited among pregnant women. Several studies highlight this knowledge gap, necessitating better education and prenatal counseling.

Knowledge Gaps in Down Syndrome Awareness

A cross-sectional descriptive study conducted at KMC & TU Teaching Hospital between February and April 2022 assessed 257 pregnant women (11-13 weeks gestation) who visited the OPD. Only 53% were aware of DS screening, while 65% incorrectly believed that ultrasonography by itself was diagnostic for it. A mere 28% were aware of DS as a genetic condition causing mental and physical disabilities, indicating severe gaps in awareness (Bajagain et al., 2023).

Similarly, a 2021 PAHS OBG department survey found that 60% of pregnant women had not heard of DS screening tests, yet 56% were willing to accept screening. Notably, one in five of the women would not continue the pregnancy if they had DS. Awareness was noted to increase with rising socioeconomic status (Gurung et al., 2022).

Global Perspectives on Down Syndrome and Birth Defects

Studies from South-Central India found that 50% of participants were not knowledgeable about risk factors such as consanguinity, maternal obesity, and advanced maternal age. Some failed to identify the risks of over-the-counter medication (23.6%) or the protective effect of folic



acid (46.4%). Worryingly, 62% did not know that infections or high fever during pregnancy can result in birth defects (Mangla, 2023).

In Ethiopia, a 2020 study found that 52.2% of pregnant women were adequately informed about the prevention of birth defects, while 47.8% were poorly informed. There was common consumption of alcohol and non-prescribed drugs, but 61.4% took folic acid. Regular ANC visits reduced the risks of birth defects (Wake et al., 2022). An Ethiopian study reported traditional misconceptions, and some attributed congenital abnormalities to sin, birth control pills, or foods that come into contact with fertilizers (Taye, 2021).

Attitudes and Perceptions Toward Prenatal Screening

In Saudi Arabia, a 2019 study found that over 50% of married women were college-educated but had just 0.5% high DS knowledge. Unexpectedly, illiterate women were more accepting of continuing a pregnancy with a DS diagnosis (Alshammari et al., 2024). Similarly, in Zimbabwe, 85.4% of pregnant women enjoyed ultrasounds, but 79.3% did not know that they could detect congenital defects. Majority of associated scans to due dates or fetal sex rather than anomaly detection (Chinene & Mudadi, 2023).

In Nepal, a large-scale study (2017-2018) revealed the incidence of birth defects to be 5.8 per 1000 live births, of which cleft lip/palate (6.13%) and anencephaly (3.95%) were the most common (Paudel, 2021). In KMC & TU Teaching Hospital (2017-2018), 24.2% of neonates had genitourinary issues, followed by musculoskeletal (21.2%) and cardiovascular defects (18.2%) (Shrestha & Shrestha, 2020).

Thus, these studies demonstrate a general absence of knowledge about Down syndrome and prenatal screening. Misconceptions exist, and a significant proportion of women are unaware of risk factors, diagnostic tests, and prevention. More education in antenatal visits and in community awareness programs is needed to close this gap and allow informed decision-making in pregnancy.

Methods

A cross-sectional descriptive study to understanding of congenital abnormality and its related variables was determined among pregnant women in Data were collected in the Antenatal Outpatient Department of Paropakar Maternity & Women Hospital in Thapathali, Kathmandu. Non-probability purposive sampling was applied to obtain the sample. As per the research objectives, analysis of the literature on the subject, and discussion with the subject experts, advisors, and research teachers, the semi-structured questionnaire was used with the sample size of 167. A systematic analysis of the literature and a discussion with the subject teacher and research advisor ensured the content validity of the instrument. The instrument was translated into Nepali once it was invented in English.

Results

The 167 pregnant women who are attending out patient department in Paropakar Maternity & Women hospital, Thapathali were included in the study. The knowledge regarding congenital anomalies & it's associated factors among pregnant women was analyzed for obtaining the outcomes based on the objectives.

Table 1: Socio-demographic characteristics

N =167

Variables	Characteristics	Number	Percentage (%)
Age	<20 years Years	25	15%
	21-40 years	139	83%
	>41 years	3	2%
Caste	Bhrahman	40	24%
	Chetri	47	28%
	Newar	62	37%
	Gurung	2	2%
	Madhesi	16	9%
Education	Illiterate	25	15%
	Below 10 class	43	26%
	SEE pass	37	22%
	Certificate level	44	26%
	Bachelor level	16	10%
	Master and above	2	1%
Occupation of pregnant mother	Housemaker	79	47%
	Farming	1	0.5%
	Health professionals	10	6%
	Self-employed	27	17%
	Banker and finance	4	2%
	Private Sector	35	21%
	Student	11	6.5%

Table 1 shows that the 167 pregnant women who are attending antenatal out patient department in Paropakar Maternity & Women hospital, Thapathali included in the study. The knowledge regarding congenital anomalies and its associated factors among pregnant women were analyzed for obtaining the outcomes based on the objectives. The study found that majority of more than half 139 (83%) of pregnant women are age of 21 - 40 years, highest 62 (37%) cast are Newar i.e. 44 (26%) have completed certificate level and near the half percentage 79 (47%) of pregnant women found that house maker.

Table 2: Level of knowledge regarding Congenital anomalies & it's association factors

N = 167

Knowledge category	Frequency (n)	Percentage (%)	Remarks
Poor (<50%)	82	49%	
Moderate (50-74%)	67	40%	
Good (>75%)	18	11%	
Total	167	100.0	

Table 2 shows that the knowledge relating to congenital anomalies and its associated factors. majority of 82 (49%) of them have poor knowledge regarding congenital anomalies. Likewise 67 (40%) have moderate knowledge only 18 (11%) of pregnant women have good knowledge.

Association of Knowledge level with sociolect-demographic characteristics

Table 3: Association of Knowledge with age

Characteristics	Age (<20 years)	Age (>20 years)	p value
Knowledge			
Poor knowledge	23 (92 %)	59 (41 %)	0.15
Moderate knowledge	2 (8 %)	65 (46 %)	
Good knowledge	0 (0,0%)	18 (13%)	
Total	25 (100%)	142 (100%)	

Table 3 shows that association of knowledge with age, among 25 pregnant women who are <20 years of age 92% have poor knowledge just 8 % have moderate knowledge. among 142 pregnant women who are > 20 years, among that 46% pregnant women have moderate knowledge but still 41% have poor knowledge likewise just 13% have good knowledge. Chi-squared test was done which showed p value as 0.15, indicating no significant association

Table 4: Association of Knowledge with education

Characteristics	Education (Below SEE)	Education (SEE & above)	P value
Knowledge			
Poor knowledge	57 (84 %)	25 (25%)	0.122
Moderate knowledge	11 (16 %)	56 (57 %)	
Good knowledge	0 (0,0%)	18 (18%)	
Total	68 (100)	99 (100)	

Table 4 shows that association of knowledge with education, about below SEE level education 68 pregnant women among that more than half 84 % have poor knowledge just 16 % have moderate knowledge. About SEE and above more than 99 pregnant, among that more than 57% have moderate knowledge but 25% have poor knowledge likewise just 18% have good knowledge. However, the association between educational status of pregnant women and knowledge level was not found to be statistically significant.

Discussion

A cross-sectional study at Paropakar Maternity & Women's Hospital in Kathmandu estimated knowledge on congenital abnormalities and its determinants among expectant women. Among 167 participants, the majority (83%) aged between 21–40 years, and Newar ethnicity (37%) and housewife (47%) were the most common. A majority were found to have knowledge gaps—49% had poor understanding, 40% moderate awareness, and 11% good knowledge of congenital abnormalities.



The same pattern was observed in a larger study of 636 pregnant women, where only 49.2% were aware of birth defects. Younger women (<25 years) were far less aware (AOR = 0.16), while urban residents (AOR = 6.06) and those with access to antenatal care (ANC) prior to 20 weeks (AOR = 3.42) were more aware (Ferede AA, 2023). This correlates with empirical evidence from Ethiopian public hospitals, where education level, urban residence, and prior exposure to ultrasound had strong influences on awareness (Molla W, 2022).

Younger women (<20 years) were particularly ill-informed (92%) within the Kathmandu study, and over 20 years reported marginally improved but still inadequate understanding (46% moderate, 41% poor). Statistical analysis ($p = 0.15$) did, however, yield no significant correlation between age and comprehension. Comparable results have been found from an Ethiopian study, where cultural beliefs influenced attitudes—53.6% of pregnant women believed that antenatal exercises were not suitable to their environment. Higher education, job status, and previous counseling greatly enhanced knowledge and practices (Janakiraman B, 2021).

Conclusion

Pregnant women who are attending in outpatient department generally had poor knowledge about congenital anomalies & its associate factors. Therefore, while developing a campaign to raise awareness about congenital abnormalities, health professionals should use this finding as a reference. Proper health education during pregnancy checkup and creating awareness through mass media will improve mother's knowledge hence prevalence & incidence of congenital anomalies can be reduced.

Recommendation

Based on the study of knowledge regarding congenital anomalies, it is recommended to maintain diet, regular antenatal checkup, exercise etc., which can prevent of congenital anomalies and it is suggesting to other academic institutes to conduct the similar research in the rural, and rural-urban sample to do a comparative study of the congenital anomalies and its association factors.



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