

Antenatal care among women in Chitwan district of Nepal: A cross-sectional study

Sharmila Pokharel^{1*}; Ram Krishna Maharjan²

¹Health and Population Education Department, University Campus, T.U., Kirtipur

²Health and Population Education Department, University Campus, TU.,

*Correspondence:., pokhrelsharu37@tucded.edu.np; ORCID: 0000-0003-4347-978X

ABSTRACT

Antenatal care is one of the most effective measures to reduce maternal mortality in Lower Middle-income Countries. The study aims to assess the utilization of antenatal care and related factors by breastfeeding mothers in Chitwan district of Nepal. A cross-sectional study was carried out in Bharatpur municipality in April 2020, among all women of the reproductive age group (15-49) who have had a birth child in the last 12 months before the survey date. A census sampling technique was used to select respondents. The vaccination period was two weeks. All the mothers who came to the vaccine center to vaccinate their children were the respondents of this study. The data were collected by using an interview schedule. The collected data were managed using SPSS Version 20. The study found that 84.31 percent of respondents attended more than four antenatal care utilization. The educational level of the respondents and the occupation of their partners were linked to the use of antenatal care. The number of pregnancies, the number of live births, the place of delivery, and the educational level and occupations of the birth attendees were also significantly linked to the use of antenatal care. Community mobilization and intensive use of community health workers are essential factors to improve the use of antenatal care.

Keywords: Antenatal care, Lower Middle-income Countries, maternal health, Nepal, pregnant women

INTRODUCTION

Sexual and reproductive health problems account for a third of all health problems in women between 15 and 49 years. Women face many health problems. In some aspects, women's health deserves special attention (Di Lego, Di Giulio, & Luy, 2020; Simkhada, van Teijlingen, Porter & Simkhada, 2006). There are conditions that only women experience, i.e. pregnancy and childbirth. These are not diseases but biological and social processes involving health risks and requiring medical attention (Shrestha, 2018; WHO, 2009). Skilled health care professionals provide a pregnant woman with the ability to confirm the best health conditions for both mother and baby during pregnancy, defined as antenatal care (ANC) (Sarfraz, Tariq, Hamid, & Iqbal, 2015). Under physical risk identification, identifying and preventing pregnancy-related risks or

managing contemporary diseases, health education and health promotion are the core of ANC (Lori, Ofosu-Darkwah, Boyd, Banerjee, & Adanu, 2017).

Maternal mortality remains a major public health issue in Nepal (Aryal & Shrestha, 2020; Darney, Nakamura-Pereira, Regan, Serur, & Thapa, 2020; Pasa, Giri, & Nabita, 2020). Lack of access to basic maternal health care, difficult geographical terrain, poorly developed transportation, communication, poverty, illiteracy, low status of women in society, political conflict, poor health, and social workers are calling into question the improvement of maternal health in Nepal (Casebolt, 2020; Parsekar, Pundir, & Bevilacqua, 2020). Maternal mortality is one of the main indicators of the availability and use of reproductive health care. However, it can also be an indicator of the status of women in society (Kumari et al., 2019).

Social status (i.e. caste) is a barrier to maternal health care use from health institutions. Religious and social beliefs also affect pregnancy and antenatal care (ANC), which is an important aspect of any woman during pregnancy (Sharmila Pokharel, 2019; Sharmila Pokharel, 2020). ANC diagnoses and treats complications related to pregnancy. Antenatal care helps to reduce maternal and perinatal morbidity and mortality during the childbirth period (Lincetto et al., 2006). At least four ANC visits during pregnancy are highly recommended by WHO (WHO, 2014). This ensures the appropriate level of referral care (Haws et al., 2009; WHO, 2016b). Three delays are important factors behind maternal and new birth. These are pregnancy, childbirth, and postpartum death, which can only be prevented by prenatal care. The National Safe Motherhood Program also plays an important role in reducing neonatal mortality and malformations (Dahal, 2013).

World Health Organization (WHO) estimates that more than half a million women lose their lives in the process of reproduction every year. Worldwide, about 99 percent of these deaths are from developing countries (Roy & Haque, 2018). In developing countries, women do not receive adequate antenatal care during pregnancy. Nursing practice is for an adult female who is becoming a mother to childbearing and child-rearing and raises a healthy child who can solve psychological problems. In addition to encouraging women to have healthy babies, it is important to promote the health of both the baby and the mother. Prenatal care is essential for the good health of women and fetuses during childbirth. The responsibility of the families for the healthy mentality of the pregnant woman also seems to be strong (Berg & Hotikasalo, 2000; Dunneram & Jeewon, 2015).

In the Nepalese context, the Government of Nepal has been providing various services to women and children. e.g., birth preparedness package, and health facilities for the delivery; incentive for delivery in hospital; blood donor preparations, and financial and other incentives etc., (Awasthi et al., 2018; Pandey & Daley, 2020; Sapkota, Bhusal, & Acharya, 2021; Tiwari, 2021). Understanding the various factors that influence antenatal care utilization is invaluable in making the appropriate programs more effective and efficient. If we do not identify these bottlenecks, we will not be able to improve antenatal care utilization properly. This requires efforts to study the critical factors influencing the use of antenatal care and other maternal health services. The result of these efforts might determine the mother's tendency to seek care who has different socio-demographic characteristics as an influence on ANC utilization.

The motivation of this study is to assess factors associated with antenatal care among women who have been utilizing the antenatal health services from the health facility. This study seeks the services rendered by nursing mothers in the antenatal period. Understanding the factors associated with ANC utilization during pregnancy will guide the development of sustainable

intervention programs that will enhance the health and nutritional status of pregnant women in Nepal. The government has offered Free service utilization in Nepal. Although this topic has been extensively researched in most of the world, there has been little rigorous research to explain the limiting factors for women receiving antenatal care in Chitwan, Nepal.

MATERIALS AND METHODS

Study design and setting

A community-based cross-sectional study was conducted from April 5 to April 20, 2020. All women of the reproductive age group (15-49 years) who have had a birth in the last 12 months prior to the survey date in Chitwan participated in this study. I needed those women for this study who came to the vaccination center for their own child vaccination. First, the structured interview schedule was prepared in reference to previous literature and then the vaccination center was identified purposively. The census method was adopted, where all the women were the respondents who vaccinated their children during the two-week vaccination period. The verbal consent from the respondents was taken by the researcher herself and respondents were happily ready to fill the interview schedule.

Sample size and sample procedure

The sample size was determined by a census sampling technique that included a total of 102 nursing mothers who came to the vaccination center to vaccinate their babies for a two-week vaccination period. All women (102) who came to the vaccination site to vaccinate their babies were included in the study.

Data collection tools

A structured interview schedule was used for data collection; various parts of the relevant literature were reviewed in order to develop the tool that addressed the aim of the study: and the tool was trial tested with 30 respondents who belonged to another ward in Chitwan district. Cronbach Alfa was used for tools internal consistency. Data showed that internal consistency was 0.7. The results of the trial test were used to modify the interview schedule accordingly. The interview schedule was designed to provide information on socio-demographic characteristics, reproductive history, knowledge, attitudes, and practices regarding the dangerous sign of pregnancy and use of free service antenatal care.

Analysis of data

The collected interview schedules were manually checked for completeness, coded, and entered for analysis in SPSS (Statistical Package for the Social Sciences) version 20.0. Bi variable chi-square test, crude odds ratios (COR), and class interval analysis were used to determine the association of variables. Class Interval analysis is used to differentiate variables into different ranges. P-value <0.05 was used as significantly associated with ANC utilization.

Ethical statement

The ethical consent was taken from the ward office before the data collection and written, and verbal consent was obtained as well from the study respondents

RESULTS

Socio-demographic characteristics

About 50 % of respondent mothers from Chitwan participating in this study were 21-30 years old, whereas 9.61% of respondents were below 20 years old while 21.57% and 5.88% of the respondents were 31-35 years old and more than 35 years old, respectively. Regarding ethnicity, 41.18% of respondents were Brahmin, while 10.78% were Chhetri, 23.52% were Janajati and the remaining 24% comprised the respondents from other ethnicities. The majority of the respondents (90.2%) followed Hinduism, while 5.88% and 3.92% followed Buddhism and Christianity. Almost 88.24% of women were married, whereas the remaining were divorced during the antenatal period. Apart from that, 90.2 % of the respondent women were educated, while only 22.55% were involved in income-generating occupations with their spouses. The respondents' partners were also educated by 94.12% and among them, 82.35% were involved in income-generating jobs. The majority, 69.61% of the respondents' families, had a monthly income of fewer than 20,000 NR, where 38.24% of both respondents and their partners were employed for income generation.

Table 1: *Demographic and socioeconomic characteristics of participants*

Variables	Response	Frequency	Percent
Age group in years	<20	20	19.61
	21-30	54	52.94
	31-35	22	21.57
	>35	6	5.88
Ethnicity	Brahmin	42	41.18
	Chhetri	11	10.78
	Janajati	24	23.53
	Others	25	24.51
Religion	Hindu	92	90.20
	Buddhist	6	5.88
	Christian	4	3.92
Marital status	Married	90	88.24
	Separated	12	11.76
Educational status	Cannot read and write	6	5.88
	Able to read and write	4	3.92
	Educated	92	90.20
Occupation	Housewife	79	77.45
	Employed	23	22.55
Educational status of partner	Cannot read and write	5	4.90
	Able to read and write	1	0.98
	Educated	96	94.12
Occupation of partner	Farmer	18	17.65
	Others	84	82.35
Income	<20000	71	69.61
	20000	3	2.94
	>20000	28	27.45
Principal income generator	Self	6	5.88
	Husband	57	55.88
	Both	39	38.24

History of pregnancy and antenatal care utilization

Approximately 12.75% of the participants have already given birth twice before the data collection. Only 10.78% attempted abortion at least once. It is observed that 87.25% of the study participants gave birth at least once prior to the study. However, only 66.66% of them attended ANC. During this time, 16.67% of study participants gave birth at home and 16.66% of them were assisted by traditional obstetricians, a parent/neighbor, or alone. Therefore, the number of pregnancies (X^2 , $p=3.60$, 0.05), the number of live births (X^2 , $p=0.35$, 0.05), the place of delivery (X^2 , $p=5.15$, 0.05), and the assistance by obstetricians (X^2 , $p=2.68$, 0.05) had a statistically significant relationship with the number of times of use of antenatal care by the pregnant women (Table 2).

Table 2: ANC utilization during pregnancy

Characteristics	ANC use during pregnancy		N	Percent	p-value	X^2
	Yes	No				
Pregnancy					0.05	3.60
<=2	74	15	89	87.25		
3-5	10	3	13	12.75		
Abortion					0.05	3.50
1 time	8	3	11	10.78		
2 times	1	7	8	7.84		
>3 times	1	1	2	1.96		
Live Birth					0.05	0.35
<=2	68	21	89	87.25		
3-5	4	9	13	12.75		
Still Birth					0.05	0.28
<=2	8	2	10	9.80		
>2	2	2	4	3.92		
Place of delivery					0.05	5.15
Home	5	12	17	16.67		
Health post	5	1	6	5.88		
Health center/hospital	60	19	79	77.45		
Delivery assisted by					0.05	2.68
Health assistant	60	25	85	83.33		
Relative/neighbor	5	12	17	16.67		
Alone	0	0	0	0		

Perceptions about advantages of ANC concerning ANC utilization

As presented in table 3, 86.27% of the women were informed about the advantages of ANC and 56.86% of respondents thought the appropriate time to begin ANC after conception is < 12 weeks. Of those who have information about the advantage of ANC follow up, 78.43% of women reported that think appropriate ANC follow up can prevent disease transmission from mother to child, 85.29% know the risk of the maternal conditions for the fetus; 88.24% pregnant mother needs supplementation during her pregnancy, and 81.37% replied pregnant mother needs to initiate ANC early only if she had complication in her previous pregnancy. Information about the advantage of ANC has strong implications for the utilization of the service. Similarly,

knowing that ANC follow-up help follows the health of the mother and fetus has direct significance to the utilization of ANC and knowledge, as shown in table 3.

Table 3: Perceptions towards ANC among pregnant mothers who attended ANC at Chitwan

Perception of ANC	Yes	No
ANC is important for maternal health	88 (86.27%)	14 (13.73%)
An appropriate time to begin ANC after conception is < 12 weeks	58 (56.86%)	44 (43.14)
ANC visit is needed during pregnancy > 4 times?	15 (14.71%)	87 (85.29%)
A pregnant mother needs to initiate ANC early only if she had a complication in her previous pregnancy	83 (81.37%)	19 (18.63%)
Pregnant mother needs supplementation during her pregnancy	90 (88.24)	12 (11.76%)
Maternal conditions risk for the fetus	87 (85.29%)	15 (14.71%)
Appropriate ANC follow-up can prevent disease transmission from mother to child	80 (78.43%)	22 (21.57%)

Sources of information for ANC in health facilities

It is observed that 67.64% heard the existence of ANC in health facilities. However, 60.78%utilized ANC and the remaining participants, 39.21%, never attended ANC. Based on these results, awareness of the existence of antenatal care in health institutions was significantly associated with the utilization of ANC. Source of information from health workers (X^2 , $p=1.51$, 0.05 $OR=3.46$, $CI=1.64-7.33$), relatives/friends (X^2 , $p=4.59$, 0.05 , $OR=1.64$, $CI=0.45-5.89$), and information from television (X^2 , $p=0.82$, 0.05 , $OR=0.32$, $CI=0.06-1.71$) had a statistically significant relationship with the number of times of use of antenatal care by the pregnant women (table 4).The crude Odd Ratio is used to predict the relationship of variables with one independent individual variable. The basic source of information for ANC utilization in this study area were health care workers relatives and/or friends, radio and television, which accounted for 16 (15.68%), 14 (13.72%), 73 (71.56%), and 33 (32.35%), respectively as shown in table 4.

Table 4: Source of information of pregnant women for utilization of ANC

Variables	Ever attended ANC		N	Percent	p-value	X^2	COR	CI
	Yes	No						
Heard existence of ANC service	69	33	102		0.05	0.61	6.22	2.22, 17.50
Yes	40	22	62	60.78%				
No	29	11	40	39.21%				
Heard from health workers	45	13	58		0.05	1.51	3.46	1.64, 7.33
Yes	12	4	16	15.68%				
No	33	9	42	41.17%				
Heard from relatives/friends	17	8	25		0.05	4.59	1.64	0.45, 5.89
Yes	10	4	14	13.72%				
No	7	4	11	10.78%				
Heard from radio	56	46	102		0.05	1.50	1.51	0.51, 4.49
Yes	39	34	73	71.56%				

No	17	12	29	28.43%				
Heard from television	25	33	58		0.05	0.82	0.32	0.06,
Yes	20	13	33	32.35%				1.71
No	5	20	25	24.50%				

DISCUSSION

A significant percentage of 84.31% of the respondents had attended antenatal care during their pregnancy in Parasnagar, Chitwan. The educational level of the respondents and the occupation of their partners were largely linked to the use of antenatal care. But Konlan et al. (2020) claim that there was no significant association between the educational level of women and the use of ANC services. The number of pregnancies, the number of live births, the place of delivery, and the qualification or profession of the birth attendees were also significantly linked to the use of antenatal care. First, the main factor that increased antenatal care uptake in this study may be that the analysis was performed on women who received antenatal care from a health professional. For example, most of the antenatal care was provided by health expansion workers in Chitwan, Nepal. However, other studies have shown that antenatal care is usually only performed by a skilled birth attendant (Devkota et al., 2020; Lama et al., 2020). Secondly, the socioeconomic status of the participants in the study was much better than expected. As a result, the infrastructure was more accessible, the women were more aware of the service, and the places of residence in the current study were more urbanized than before.

This may be due to increased awareness, access to services, and understanding of service use by participants in this study. Additionally, antenatal care use has been limited to the last pregnancy for easy recall. In summary, all of these factors that increased antenatal use in the current study, i.e. education level, frequency of radio listening, religion, and the number of children, were statistically associated with antenatal use. Study participants who were educated and were able to read and write attended antenatal care more often than women without formal education (Chanda et al., 2020). Other previous findings support the finding of the present study (Bintabara, Mohamed, Mghamba, Wasswa, & Mpembeni, 2015; Birmeta, Dibaba, & Woldeyohannes, 2013; Choulagai et al., 2013; Pell et al., 2013; Tsegay et al., 2013). The possible rationale for this finding could be that more educated mothers who tend to use antenatal care have a better understanding of information and better understand the importance of the service. In addition, educated women are more likely to improve their independence, self-confidence, and their ability to make decisions about their health (Shitie, Assefa, Dhressa, & Dilnessa, 2020). Educated women are also likely to strive for better quality services and a better ability to use health services that provide better care (Zhang et al., 2020). According to this finding, antenatal care services were used more by women with an affluent wealth index than women in the quintile with the poorest wealth.

Higher parity women who have more than three children were 40% less likely to seek antenatal care than their counterparts. Similar results have been reported in other recent studies (Ali et al., 2020; Dahiru & Oche, 2015; Karkee, Lee, & Binns, 2015; Berhan Tsegaye & Mohammed Ayalew, 2020). The possible reason could be due to several factors: traditional practices are common among women with many children, high parity women are less economically disadvantaged groups, and high parity women are relatively less likely to experience impediments during pregnancy and other complications due to their extensive experience of childbirth (Gabrysch & Campbell, 2009). Consequently, they do not use prenatal services like their peers. In short, women with high parity are less motivated to visit health facilities for

antenatal care. In terms of listening habits to the radio, study participants who listened to the radio often visited more antenatal care than their counterparts (BANDA, 2013; Berhan Tsegaye & Mohammed Ayalew, 2020).

This study shows that the health care service facility provided by the government of Nepal has been playing a dominant role to save the lives of pregnant mothers and the lives of nursing mothers with their newly born babies. Majority of the pregnant woman get pregnant on time and on the age of legally certified by the government. Some of the nursing (breastfeeding) mothers responded that they have been taking ANC health service facilities up to the pregnancy. By the government campaign, the majority of the nursing mothers have been benefitted, so the analysis of the study revealed that the government has been doing a better job by informing about the ANC health service facility to the people of the country. The nursing mothers were taking the time and again the medicine and health service facility at the time of pregnancy distributed by the government of Nepal (Simkhada, Van Teijlingen, Porter, & Simkhada, 2010). In Nepal, the use of maternal health services depends on the socioeconomic status of women. Women with higher socioeconomic status in education, wealth, and urban residency benefit from better health services, including maternity care (Awasthi et al., 2018). A study in Nepal by S. Neupane and Nwaru (2014) found that educated young women whose husbands were also educated lived in urban areas held non-farm jobs and fell into wealthier quintiles, more likely to have participated in four or more ANC and receive top-quality ANC. Very few studies focus on the quality of antenatal care in low-income countries like Nepal, and most of them have focused only on single factors (B. Neupane, Rijal, G.C, & Basnet, 2020). However, The World Health Organization also suggested that women with normal pregnancies receive ANC services within four visits (WHO, 2016a).

This study has a number of limitations. Firstly, the analysis is limited to women who participated in the vaccination program during the sampling period. Secondly, this study was community-based, so it did not consider factors related to antenatal care use in health care facilities. Finally, the cross-sectional nature of the study failed to expand the temporal relationship of the variables. Therefore, further studies should be explored to identify factors related to health facility factors too. In addition, the use of antenatal care should be based on the WHO definition at the national level.

CONCLUSION

According to the aim of the study, the uptake of antenatal care in this study is slightly higher than in previous national results in Nepal. However, this is still not satisfactory. Women with higher educational status, more frequent radio listening, and a wealthy quintile are factors that positively influence the use of antenatal care. In contrast, adherents of traditional beliefs and three or more children were negatively related to obstetric care. For this reason, the Nepalese Ministry of Health, policymakers, and program designers should use various media to raise awareness about the use of antenatal care. Based on the results, awareness of prenatal care in health care facilities was significantly linked to the use of ANC; Information about the benefit of ANC has a strong impact on the use of the service. In addition, improving socioeconomic status, design and implementation of various family planning programs should be mandatory.

Similarly, intensive education programs for traditional believers should be designed to increase the use of antenatal care at the right time of the pregnancy. In summary, it can be said that raising awareness and improving the living conditions of women could increase the use of antenatal care. As a result, maternal mortality and morbidity can be reduced, and Nepal's

sustainable development goal target can be achieved. Awareness can be spread based on the findings of this study by including topics related to service utilization in the school's curriculum. The government and policymakers should be alert and keep women's health in the Centre while making strategies towards sexuality and reproductive health. Women's health is most important for a harmonious family and society. Therefore, we should convince every pregnant woman to take ANC utilization during pregnancy for their good health.

Acknowledgments

We are grateful to Tribhuvan University for its logistic support. This article has been extracted from the mini-research from the Dean's office, Tribhuvan University.

REFERENCES

- Adegboyega, T., Guyon, A., Mengiste, G., Robalo, M., ba-Nguz, E., Habimana, S., Mongi, P., Rogo, K., Bahl, R., Kak, L., Munjanja, S., Rollins, N., Begkoyian, G., Kerber, K., Mwebesa, W., Sagoe-Moses, C., Chitsike, I., Ketsela, T., Narayanan, I., ... Yakubu, A. (2006). *Antenatal Opportunities for Africa's newborns: Practical data, policy programmatic support for newborn care in Africa*. Retrieved from <https://www.who.int/pmnch/media/publications/oanfullreport.pdf?ua=1>
- Ali, S. A., Ali, S. A., Feroz, A., Saleem, S., Fatmai, Z., & Kadir, M.M. (2020). Factors affecting the utilization of antenatal care among married women of reproductive age in the rural Thatta, Pakistan: Findings from a community-based case-control study. *BMC Pregnancy and Childbirth*, 20(1): 1-12. doi: <http://doi.org/10.1186/s12884-020-03009-4>
- Aryal, S., & Shrestha, D. (2020). Motherhood in Nepal during COVID-19 Pandemic: Are We Heading from Safe to Unsafe? *Journal of Lumbini Medical College*, 8(1): 128-129. doi: <https://doi.org/10.22502/jlmc.v8i1.351>
- Awasthi, M. S., Awasthi, K. R., Thapa, H. S., Saud, B., Pradhan, S., & Agrawal Khatry, R. (2018). Utilization of Antenatal Care Services in Dalit Communities in Gorkha, Nepal: A Cross-Sectional Study. *Journal of Pregnancy*, 2018: 3467308. doi: <https://doi.org/10.1155/2018/3467308>
- Banda, C. L. (2013). Barriers to utilization of focused antenatal care among pregnant women in Ntchisi district in Malawi. Master's thesis, University of Tampere. Retrieved from <https://core.ac.uk/download/pdf/250122343.pdf>
- Berg, M., & Hotikasalo, M. L. (2000). Pregnancy and diabetes-a hermeneutic phenomenological study of women's experiences. *Journal of Psychosomatic Obstetrics Gynecology*, 21(1): 39-48. doi: <https://doi.org/10.3109/01674820009075607>
- Bintabara, D., Mohamed, M. A., Mghamba, J., Wasswa, P., & Mpembeni, R. N. M. (2015). Birth preparedness and complication readiness among recently delivered women in chamwinc district, central Tanzania: A cross sectional study. *Reproductive Health*, 12(1): 1-8. doi: <https://doi.org/10.1186/s12978-015-0041-8>
- Birmeta, K., Dibaba, Y., & Woldeyohannes, D. (2013). Determinants of maternal health care utilization in Holeta town, central Ethiopia. *BMC Health Services Research*, 13(1), 1-10. doi: <https://doi.org/10.1186/1472-6963-13-256>

- Casebolt, M. T. (2020). Barriers to reproductive health services for women with disability in low-and middle-income countries: A review of the literature. *Sexual & Reproductive Healthcare*, 24: 100485. doi: <https://doi.org/10.1016/j.srhc.2020.100485>
- Chanda, S. K., Ahammed, B., Howlader, M. H., Ashikuzzaman, M., Shovo, T-E-A, & Hossain, M.T.(2020). Factors associating different antenatal care contacts of women: A cross-sectional analysis of Bangladesh Demographic and Health Survey 2014 Data. *PLoS One*, 15(4): e0232257. doi: <https://doi.org/10.1371/journal.pone.0232257>
- Choulagai, B., Onta, S., Subedi, N., Mehata, S., Bhandari, G.P., Poudyal, A., Krettek, A. (2013). Barriers to using skilled birth attendants' services in mid-and far-western Nepal: a cross-sectional study. *BMC International Health and Human Rights*, 13(1):1-9. doi: <https://doi.org/10.1186/1472-698X-13-49>.
- Dahal, R. K. (2013). Utilization of antenatal care services in rural area of Nepal. *International Journal of Collaborative Research on Internal Medicine Public Health*, 5(2), 120-131. Retrieved from <https://www.iomcworld.org/articles/utilization-of-antenatal-care-services-in-rural-area-of-nepal.pdf>
- Dahiru, T., & Oche, O. M. (2015). Determinants of antenatal care, institutional delivery and postnatal care services utilization in Nigeria. *Pan African Medical Journal*, 21:321. doi: <https://doi.org/10.11604/pamj.2015.21.321.6527>
- Darney, P. D., Nakamura-Pereira, M., Regan, L., Serur, F., & Thapa, K. (2020). Maternal Mortality in the United States Compared With Ethiopia, Nepal, Brazil, and the United Kingdom: Contrasts in Reproductive Health Policies. *Obstetrics & Gynecology*, 135(6): 1362-1366. doi: <https://doi.org/10.1097/AOG.0000000000003870>
- Devkota, B., Maskey, J., Pandey, A. R., Karki, D., Godwin, P., Gartoulla, P., Aryal, K. K. (2020). Determinants of home delivery in Nepal - A disaggregated analysis of marginalised and non-marginalised women from the Nepal Demographic and Health Survey 2016. *PLoS One*, 15(1): e0228440. doi: <https://doi.org/10.1371/journal.pone.0228440>
- Di Lego, V., Di Giulio, P., & Luy, M. (2020). Gender Differences in Healthy and Unhealthy Life Expectancy. In *International Handbook of Health Expectancies* (pp. 151-172): Springer.
- Dunneram, Y., & Jeewon, R. (2015). Healthy diet and nutrition education program among women of reproductive age: A necessity of multilevel strategies or community responsibility. *Health Promotion Perspectives*, 5(2):116-127. doi: <https://doi.org/10.15171/hpp.2015.014>
- Gabrysch, S., & Campbell, O. MR.(2009). Still too far to walk: Literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth*, 9:34. doi: <https://doi.org/10.1186/1417-2393-9-34>.
- Haws, R. A., Yakoob, M. Y., Soomro, T., Menezes, E. V., Darmstadt, G. L., & Bhutta, Z.A. (2009). Reducing stillbirths: Screening and monitoring during pregnancy and labour. *BMC Pregnancy and Childbirth*, 9(1): S5. doi: <https://doi.org/10.1186/1471-2393-9-S1-S5>

- Karkee, R., Lee, A. H., & Binns, C. W. (2015). Bypassing birth centres for childbirth: An analysis of data from a community-based prospective cohort study in Nepal. *Health Policy and Planning*, 30(1): 1-7. doi: <https://doi.org/10.1093/heapol/czt090>
- Konlan, K. D, Saah, J. A., Amoah, R. M., Doat, A. R., Mohammed, I., Abdulai, J. A., & Konlan, K.D. (2020). Factors influencing the utilization of focused antenatal care services during pregnancy:A study among postnatal women in a tertiary healthcare facility, Ghana. *Nursing Open*, 7(1); doi:1822-1832. <http://doi.org/10.1002/nop2.5>
- Kumari, S., Garg, N., Kumar, A., Guru, P. K. I., Ansari, S., Anwar, S., ... Sohail, M. (2019). Maternal and severe anaemia in delivering women is associated with risk of preterm and low birth weight: A cross sectional study from Jharkhand, India. *One Health*, 8: 100098. doi: <https://doi.org/10.1016/j.onehlt.2019.100098>
- Lama, T. P., Munos, M. K., Katz, J., Khattry, S. K., LeClerq, S. C., & Mullany, L. K.(2020). Assessment of facility and health worker readiness to provide quality antenatal, intrapartum and postpartum care in rural Southern Nepal. *BMC Health Services Research*, 20(1): 16. doi: <https://doi.org/10.1186/s12913-019-4871-x>
- Lori, J. R., Ofosu-Darkwah, H., Boyd, C. J., Banerjee, T., & Adanu, R. M. K. (2017). Improving health literacy through group antenatal care: A prospective cohort study. *BMC Pregnancy and Childbirth*, 17(1): 228. doi: <https://doi.org/10.1186/s12884-017-1414-5>
- Neupane, B., Rijal, S., GC, S., & Basnet, T. B. (2020). Andersen's model on determining the factors associated with antenatal care services in Nepal: An evidence-based analysis of Nepal demographic and health survey 2016. *BMC Pregnancy and Childbirth*, 20(1): 308. doi: <https://doi.org/10.1186/s12884-020-02976-y>
- Neupane, S., & Nwaru, B. I. (2014). Impact of Prenatal Care Utilization on Infant Care Practices in Nepal: A National Representative Cross-sectional Survey. *European Journal of Pediatrics*, 173(1): 99-109. doi: <http://dx.doi.org/10.1007/s00431-013-2136-y>
- Pandey, S., & Daley, A. (2020). Free delivery care and supply-side incentives in Nepal's poorest districts: The effect on prenatal care and neonatal tetanus vaccinations. *Journal of Development Effectiveness*. doi: <https://doi.org/10.1080/19439342.2020.1853794>
- Parsekar, S. S., Pundir, P., & Bevilacqua, V. (2020). Reproductive, Maternal, Newborn, Child and Adolescent Health and related Behaviour Change Communication strategies in Bangladesh, Nepal and India: A Narrative Review. *Clinical Epidemiology and Global Health*, 8(1): 280-286. doi: <https://doi.org/10.1016/j.cegh.2019.08.014>
- Pasa, R. B., Giri, S., & Nabita, D. (2020). Safe Motherhood Practices in Panch Pokhari Thangpal Rural Municipality, Nepal. *Research Nepal Journal of Development Studies*, 3(2): 93-101. doi: <https://doi.org/10.3126/rnjds.v3i2.34496>
- Pell, C., Meñaca, A., Were, F., AfrahChatio, S., Manda-Taylor, L., ... & Pool, R. (2013). Factors affecting antenatal care attendance: Results from qualitative studies in Ghana, Kenya and Malawi. *PLoS One*, 8(1): e53747. doi: <https://doi.org/10.1371/journal.pone.0053747>
- Pokharel, S. (2019). A review on factor influencing the involvement of male partner in antenatal care in Nepal. *North American Academic Research*, 2(7): 1-10. doi: <https://doi.org/10.5281/zenodo.3265391>

- Pokharel, S. (2020). Major Risk Factors Faced by Women During Pregnancy in Kathmandu Metropolitan City. *Tribhuvan University Journal*, 35(1): 84-96. doi: <https://doi.org/10.3126/tuj.v35i1.35873>
- Roy, S., & Haque, M. A. (2018). Effect of antenatal care and social well-being on early neonatal mortality in Bangladesh. *BMC Pregnancy Childbirth*, 18: 485. doi: <https://doi.org/10.1186/s12884-018-2129-y>
- Sapkota, V. P., Bhusal, U. P., & Acharya, K. (2021). Trends in national and subnational wealth related inequalities in use of maternal health care services in Nepal: An analysis using demographic and health surveys (2001–2016). *BMC Public Health*, 21(8): 1-14. doi: <https://doi.org/10.1186/s12889-020-10066-z>
- Sarfraz, M., Tariq, S., Hamid, S., & Iqbal, N. (2015). Social and Societal Barriers in Utilization of Maternal Health Care Services in Rural Punjab, Pakistan. *Journal of Ayub Medical College, Abbottabad*, 27(4): 843-849. doi: <https://pubmed.ncbi.nlm.nih.gov/27004336/>
- Shitie, A., Assefa, N., Dhressa, M., & Dilnessa, T. (2020). Completion and Factors Associated with Maternity Continuum of Care among Mothers Who Gave Birth in the Last One Year in Enemay District, Northwest Ethiopia. *Journal of Pregnancy*, 2020: 7019676. doi: <https://doi.org/10.1155/2020/7019676>
- Shrestha, B. (2018). Mother's Education and Antenatal Care Visits in Nepal. *Tribhuvan University Journal*, 32(2): 153-164. doi: <https://doi.org/10.3126/tuj.v32i2.24712>
- Simkhada, B., van Teijlingen ER, Porter, M., & Simkhada, P. (2006). Major problems and key issues in Maternal Health in Nepal. *Kathmandu University Medical Journal*, 4(2), 258-263. Retrieved from <https://www.researchgate.net/publication/5249099>
- Tiwari, M. (2021). Cash Transfers and Delivery Care: Evidence from the Safe Delivery Incentive Program in Nepal. Retrieved from https://www.mandatiwari.com/publication/job-market_paper/
- Tsegay, Y., Gebrehiwot, T., Goicolea, I., Edin, K., Lemma, H., & Sebastian, M. S. (2013). Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: A cross-sectional study. *International Journal for Equity in Health*, 12(1): 1-10. doi: <https://doi.org/10.1186/1475-9276-12-30>
- Tsegaye, B., & Ayalew, M. (2020). Prevalence and factors associated with antenatal care utilization in Ethiopia: An evidence from demographic health survey 2016. *BMC Pregnancy and Childbirth*, 20(1): 528. doi: <https://doi.org/10.1186/s12884-020-03236-9>
- WHO. (2009). Women and health: Today's evidence tomorrow's agenda. World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/44168>
- WHO. (2014). WHO policy brief for the implementation of intermittent preventive treatment of malaria in pregnancy using sulfadoxine-pyrimethamine (IPTp-SP). Retrieved from <https://apps.who.int/iris/handle/10665/44168>
- WHO. (2016a). *WHO recommendations on antenatal care for a positive pregnancy experience*. World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/44168>

WHO. (2016b). *World health statistics 2016: Monitoring health for the SDGs, sustainable development goals*. World Health Organization. Retrieved from <https://apps.who.int/iris/handle/10665/44168>

Zhang, R., Chen, Y., Liu, S., Liang, S., Wang, G., Li, Li.,...& Li,Y.(2020). Progress of equalizing basic public health services in Southwest China-health education delivery in primary healthcare sectors. *BMC Health Services Research*, 20(1): 1-13. doi: <https://doi.org/10.1186/s12913-020-05120-w>