Original Research Article

Factors associated with completion of continuum of care for maternal health services in Kaski district, Nepal

Abstract

Background: The term "continuum of care" (CoC) for maternal, newborn, and child health usually refers to the continuity of care throughout the lifecycle of adolescence, pregnancy, childbirth, post-delivery period, and childhood. The objective of the study was to identify the status and factors associated with completion of the continuum of care for maternal health services.

Material and method: A community-based cross-sectional study was conducted among 372 women who have a child in less than one year. The data were collected through a face-to-face interview using pretested and structured Questionnaires. Univarite, bivariate, and multivariable analyses were carried out based on the objective of the study.

Results: The study revealed that about 75% of women completed the continuum of care for maternal health services. Multivariate logistic regression analysis found women who had four or more ANC visits (AOR: 18.00, 95% CI: 7.38-43.93) and advised for PNC checkup (AOR=3.07, 95%CI: 1.49-6.32) were statistically significant with the completion of CoC for maternal health services after adjustment of all covariates.

Conclusion: It is concluded that the majority of the participants had the completion of the continuum of care for maternal health services and an increase in the frequency of ANC visits and advised for PNC checkup during pregnancy has a positive influence in increasing the CoC completion rate.

Keywords: Continuum of Care, Utilization, Maternal Health Services, Nepal

Introduction

The term "continuum of care" (CoC) for maternal, newborn, and child health usually refers to the continuity of care throughout the lifecycle of adolescence, pregnancy, childbirth, post-delivery period, and childhood. It is considered an essential strategy to prevent maternal and child deaths. An effective continuum of care connects essential maternal, newborn, and child health (MNCH) packages^(1,2).

In South Asia, 25% of women received continuum of care in maternal health services citation. Whereas in Sub-Saharan Africa 14% of women were received all services^{(3).}Overall 47.5 % of women had a completed continuum of care in Nepal⁽⁴⁾. The completion of CoC in maternal health servicesworldwide rangesfrom 6.8- 60 %. Higher completion of the continuum of care was reported in Cambodia⁽⁵⁾.Several studies show that completion of CoC wasstudies conducted in Pakistan(27%), Ethiopia (9.1%), Ghana (8%), West Gojjam Zone Ethiopia (9.7%), Gamo Zone Southern Ethiopia (10%), Tanzania (10%), Bangladesh (30.7%), Lao PDR (6.8%), Egyptian (50.4%) and Enemay district northwest Ethiopia(45%) respectively ^{(6-15).}

The study has narrowed down the scope of CoC to the time dimension of continuity of three maternal health care services Antenatal Care (ANC), Skilled Birth Attendant (SBA), and Postnatal Care (PNC) during the period from pregnancy to childbirth to the time after delivery⁽¹⁶⁾. In developing countries, completion of the continuum of care in maternal health services is low⁽¹⁷⁾.

To this date,I did not find any study conducted on primary data of continuum of care on maternal health service. This study will identify the factors associated with the completion of the continuum of care in maternal health care services in the Kaski district. So that study will be beneficial to shape the package of maternal health services in maternal health. This study aimed to determine the status and factors associated with the completion of continuum of care for maternal health.

Materials and Methods:

A community-based cross-sectional study was conducted among women who have a child less than one year in the Kaski district, Nepal in-between February to August 2020. A sample size of 372 was determined based on the sampling formula $n = [z^2pqN /d^2 (N-1) + z^2pq]$ with 95% Confidence interval, 5% margin of error. The estimated live birth of the Kaski district is 12371, and 47.5% prevalence of completion of CoC among women in a study was conducted in Nepal⁽⁴⁾. The total sample size was 372 in this study.

Among a total of 49 wards in one metropolitan and two rural municipalities of Kaski, 12 wards were chosen randomly. Out of the 12 wards, six wards from the metropolitan and six wards from the two rural municipalities were selected randomly and the required sample size was determined based on probability proportional to size (PPS) of the total expected live birth from selected wards similarly Respondents were selected randomly from simple random sampling. Continuum of care for maternal health was a dependent variable which was operationally defined as ANC 4 visit as per protocol, delivery with SBA, one PNC visit within 24hrs. There were 28 independent variables of socio-demographic (age of mother, family type, family size, religion, ethnicity, household head, women education, husband education, women occupation, husband occupation, monthly income wealth quintile, women access to mass media), maternal and obstetric factors (number of childbirth, history of child death, birth order, mode of delivery, place of delivery, desire on pregnancy, knowledge on pregnancy danger sign, had four or more ANC visits, advice for PNC checkup), physical factors /access to health services (place of residence, mode of transportation, time to reach a health facility, distance to a health facility, enrollment in the health insurance scheme, women autonomy in health care).

The data collection tool was prepared in English and then translated into the Nepali language. Data were collected by a face-to-face interview through pretested and structured Questionnaires. To minimize the reporting bias, every participant was informed about the purpose of the study and ensured about maintaining the privacy and confidentiality of obtaining information. Validity was maintained by continuous expert opinion and through extensive literature review. This study was approved by the Public Health Program, School of Health and Allied Sciences, Pokhara University, and Ethical approval were obtained from the Nepal health research council (NHRC). Written approval for conducting the study was taken from local authorities like the Pokhara metropolitan, rural municipality. Informed written consent was obtained from each participant and confidentiality of the received information was maintained.

Collected data were coded and entered in Epi Data and extracted into Statistical Package for Social Science (SPSS) for further analysis. Descriptive statistics were reported as percentages and frequencies. Also, the chi-square test was applied to find out the association between dependent and independent variables, and the odds ratio was obtained by binary logistic regression analysis to show the strength of association. The binary logistic regression model was computed and P-value < 0.05 was considered as significant.

RESULTS

Table 1: Status of Completion of the continuum	of care for	r materna	al health services
(n=372)			

Dependent Variable (CoC)	Frequency (n=372)	Percentage (%)	
4ANC as per protocol	293	78.8	
Delivery by SBA	358	96.2	
PNC visits with in 24hrs	345	92.2	
4ANC as protocol and SBA	289	77.7	
ANC4, SBA, and PNC within 24	279	75.0	
hours of birth (CoC)			

Table1 shows the status of the complete continuum of care in maternal health. The proportion of women who have completed the continuum of care in maternal health were 279(75%).

Variables	Frequency (n)	Percentage (%)
Age of mother (years)		
15-19	30	8.1
20-24	128	34.4
25-29	125	33.6
30-34	67	18.0
35above	22	5.9
(Mean ± SD, Min-Max)	$(25.93 \pm 4.90, 16-40)$	
Family type		
Nuclear family	211	56.7
Jointed family	161	43.3

Table 2: Socio- demographic characteristics of respondents (n=372)

Family size		
<4 member of the family	89	23.9
\geq 4 member of the family	283	76.1
Household head		
Male	281	75.4
Female	91	24.5
Ethnicity		
Dalit	87	23.4
Religious minorities	13	3.5
Advantaged Janajatis	82	22.0
Disadvantage Janajatis	91	24.5
Disadvantaged non Dalit terai group	1	0.3
Brahmin/ Chhetri	98	27.3
Religion		
Hindu	321	86.3
Buddhism	24	6.5
Christian	13	3.8
Muslim	14	3.5
Women education		
No formal education	15	4.0
Basic education (1-8 Class)	106	28.5
Secondary and above	251	67.5
Women occupation		
House wife	318	85.5
Agriculture	5	1.3
Services	22	5.9
daily wage and labor	20	5.4
Own business	7	1.9
Husband education		
No formal education	16	4.3
Basic education (1-8 Class)	86	23.1
Secondary education and above	270	72.6
Husband occupation		
Agriculture	26	7.0
Services	63	16.9
Own business	69	18.5
Abroad work	82	22.0
Daily wage /labor	132	35.5

Household Monthly income		
NRs<30000	162	43.5
NRs ≥30000	210	56.5
(Median, Minimum-Maximum)	(30000,10000-200000)	
Wealth quintile		
Poorest quintile	9	2.4
Second quintile	5	1.3
Middle quintile	55	14.8
Fourth quintile	129	34.7
Richest quintile	174	46.8
Women access to mass media		
Yes	352	94.6
No	20	5.4

Table 2 shows the Socio-demographic information about participants. Out of 372 participants, slightly more than one-third of participants (34.4%) were among the age group of 20-24 years, followed by 25-29 years (33.6%), 30-34 years (18%), and 35 years and above (5.9%) respectively. The mean age of participants was $(25.93 \text{ years} \pm \text{SD4.90})$ years with a minimum age of 17 years and maximum age of 40 years. Whereas, more than half of the participants (56.7%) belonged to the nuclear family. Similarly, the majority of participants (76.1%) had more than four family members and three fourth of the participants (75.4%) had a male as a household head. Likewise, slightly more than one in four participants (27.3%) were Brahmin/ Chhetri followed by disadvantaged janajatis (24.5%), Dalit (23.4%), religious minorities (3.5%), advantage janajatis (22%), and disadvantage non-Dalit terai group (0.3%). also, the majority of participants (86.3%) were Hindu followed by Buddhism (6.5%), Islam (3.8%), and Christian (3.5%). The educational level of participants reveals more than half of the participants (67.5%) had attended secondary and above education followed by basic education (28.5) and (4%) didn't have any formal education. More than two-thirds of the participant's husband (72.6%) had attended secondary and above followed by basic education (23.1%), and no formal education (4.3%) Similarly majority of the participants (85.3%) were housewife followed by involved in own business (5.4%), services (5.9%), daily wage /labor (1.9%), agriculture (1.3%) and student (0.3%). Likewise, their occupation of the husbands was (35.5%) worked as daily wage labor followed by their own business (18.5%), services (16.9%), aboard the work (22%), and agriculture (7%). Moreover, more than half the participants (56.5%) had the monthly household

income been above thirty thousand. Nearly two fourth of participants (46.8%) belong to the richest wealth quintile followed by the fourth quintile (34.7%), middle quintile (14.8%), second quintile (1.3%), and the poorest quintile (2.4%). Similarly, the majority of participants (94.6%) had access to mass media.

Variable Completion of the continuum		Chi-square	df	p-value	
	of care	(CoC)	value		
	Yes	No			
	n (%)	n (%)			
	279 (75.0)	93 (25.0)			
Ethnicity					
Disadvantaged ethnic group	125(68.3)	58(31.7)	8.608	1	0.003*
Advantage ethnic group	154(81.5)	35(18.5)			
Religion					
Hindu	248(77.3)	73(22.7)	6.370	1	0.012*
Non-Hindu	31(60.8)	20(39.2)			
Women education					
No formal education	8 (53.3)	7 (46.7)	11.751	2	0.003*
Basic education	70 (66.0)	36 (34.0)			
Secondary education and	201 (80.1)	50 (19.9)			
above					
Husband occupation					
Informal occupations	164 (68.3)	76 (31.7)	16.032	1	< 0.001*
Formal occupations	115 (87.10	17 (12.9)			
Monthly income					
NRs <30000	109 (67.3)	53 (32.7)	9.112	1	0.003*
NRs ≥30000	170 (81.0)	40 (19.0)			
Wealth index					
Poorest	4 (44.4)	5 (55.6)	22.123	4	< 0.001*
Second	2 (40.0)	3 (60.0)			
Middle	34 (61.8)	21 (38.2)			
Fourth	92 (71.3)	37 (21.7)			
Richest	147 (84.5)	27 (15.5)			
Access to mass media					
No	11 (55.0)	9 (45.0)	4.509	1	0.032*
Yes	268 (76.1)	84 (23.9)			

Table 3: Association of socio-demographic factors with completion of the continuum of care for maternal health (n=372)

*statistically significant at the level of p-value <0.05

Table3 shows the association of socio-demographic factors with the the completion of the continuum of care in maternal health. The result of study showed that ethnicity ($\chi^2 = 8.608$, p-value = 0.003), religion ($\chi^2 = 6.370$, p-value = 0.012), women education ($\chi^2 = 11.751$, p-value = 0.003). Husband occupation ($\chi^2 = 16.032$, p-value <0.001) monthly household income ($\chi^2 = 9.112$, p-value = 0.003), wealth index ($\chi^2 = 22.123$, p-value, <0.001) and access to mass media ($\chi^2 = 4.509$, p- value = 0.032) were significantly associated completion of continuum of care in maternal health services.

Variable	completion of the CoC		Chi-square	df	p-value
	Yes	No	Value		
	n (%)	n (%)			
	279 (75.0)	93 (25.0)			
Know the danger sign during	pregnancy	\cap			
Yes	146 (81.1)	34 (18.9)	6.946	1	0.008*
No	133 (69.30	59 (30.7)			
Had four or more ANC visits					
No	10 (23.3)	34 (77.3)	72.724	1	< 0.001*
Yes	269 (82.0)	59 (18.0)			
Mode of delivery					
Normal	188 (71.20	76 (28.8)	6.958	1	0.008*
C- section	91 (84.3)	17 (15.7)			
Advised for PNC checkup					
Yes	130 (86.7)	20 (13.3)	18.246	1	< 0.001*
No	149 (67.1)	73 (32.9)			
Family support					
Yes	255 (76.5)	78 (23.4)	4.211	1	0.040*
No	24 (61.5)	15 (38.5)			

Table 4:Association of maternal and obstetric factors with completion of the continuum of care in maternal health services. (n=372)

*statistically significant at the level of p-value <0.05

Table 4 shows the association between maternal and obstetric factors and completion of the continuum of care for maternal health services. the result of the study showed that know the danger sign during pregnancy ($\chi^2 = 6.946$,p-value = 0.008), had four or more ANC visits ($\chi^2 = 72.724$, p-value <0.001), mode of delivery ($\chi^2 = 6.958$, p-value = 0.008), advised for PNC

checkup (χ^2 =18.246, p-value <0.001) and family support (χ^2 = 4.211, p-value = 0.040) were significantly associated in Pearson's chi-square test.

Variable	Completion of the CoC		Chi-square	df	p-value
			value		
	Yes	No			
	n (%)	n (%)			
	279 (75.0)	93 (25.0)			
The usual mode of travel					
Walking / by foot	19 (54.3)	16 (45.7)	8.841	1	0.003*
By use of vehicles	260 (77.2)	77 (22.8)			
Distance to the health facility					
<3 km	34 (63.0)	20 (37.0)	4.881	1	0.027*
≥3 km	245 (77.0)	73 (23.0)			
Women's autonomy					
Yes	104 (83.9)	20 (16.1)	7.806	1	0.005*
No	175 (70.6)	73 (29.4)			
Enrollment in health insurand	ce				
Yes	72 (85.7)	12 (14.3)	6.643	1	0.010*
No	207 (71.9)	81 (21.1)			

Table 5: Association of physical factors /access to health services with the completion of continuum of care in maternal health (n=372).

*statistically significant at the level of p-value < 0.05

Table 5 shows the association between physical factors/access to health services and completion of the continuum of care in maternal health services. The result of the study showed that usual mode of travel (χ^2 =8.841, p-value=0.003), distance to health facility (χ^2 =4.881, p-value=0.027), women's autonomy (χ^2 =7.806, p-value=0.005) and enrollment in health insurance scheme (χ^2 =6.643, p-value=0.010) were significantly associated in Pearson's chi squire test.

Table 6:Factors associated with the completion of the continuum of care (CoC) in maternal health services.

Variable	Completion of the CoC in maternal health services					
	Una	Unadjusted odd Ratio Adjusted odd				
	UOR	95%CI	p-Value	AOR	95% CI	p-value
Ethnicity						
Disadvantaged ethnic						
group	Reference					
Advantaged ethnic	2.04	1.26 - 3.30	0.004*	1.22	0.67-2.24	0.504
group						
Religion						
Non-Hindu	Reference					
Hindu	2.19	1.17- 4.07	0.013*	1.72	0.75-3.91	0.197
Women education						
No formal education	Reference					
Basic education	1.70	0.57-5.06	0.340	1.56	0.40-6.06	1.562
Secondary and above	3.51	1.21-10.15	0.020*	1.64	0.42-6.29	0.470
Husband occupation						
Informal occupations	Reference					
Formal occupations	3.13	1.76-5.58	< 0.001*	1.45	0.71-2.98	0.300
Access to mass media						
No	Reference					
Yes	2.61	1.04-6.51	0.040*	1.02	0.29-3.52	0.975
Monthly household inc	come					
NRs <30000	Reference					
NRs ≥30000	2.06	1.28-3.32	0.003*	1.75	0.94-3.27	0.077
Wealth quintile						
Poorest	Reference					
Second	0.83	0.09-7.65	0.873	0.41	0.02-6.72	0.536
Middle	2.02	0.48-8.39	0.332	1.62	0.25-10.26	0.608
Fourth	3.10	0.09-12.22	0.104	1.98	0.32-12.22	0.461
Richest	6.80	1.71-26.98	0.006*	2.51	0.38-16.53	0.338
Know the danger sign o	during pregna	ncy				
No	Reference					
Yes	1.90	1.17-3.08	0.009*	0.94	0.49-1.78	0.849
had four or more ANC	visits					
No	Reference					

Yes	15.50	7.25-33.12	< 0.001*	18.00	7.38-43.93	< 0.001*	
Advised for PNC check-up							
No	Reference						
Yes	3.18	1.84-5.50	< 0.001*	3.07	1.49-6.32	0.002	
Family support							
No	Reference						
Yes	2.04	1.02-4.08	0.043*	1.41	0.56-3.53	0.456	
Mode of delivery							
Normal	Reference						
C- section	2.16	1.20-3.87	0.009*	1.84	0.90-3.74	0.090	
The usual mode of tra	vel						
Walking / by foot	Reference			\sim			
By use of vehicles	2.84	1.39-5.79	0.004*	1.91	0.47-7.75	0.365	
Distance from HF							
<3km	Reference				-		
≥3km	1.97	1.07-3.63	0.029*	1.45	0.43-4.85	0.545	
Women autonomy							
No	Reference						
Yes	2.00	1.24-3.22	0.004*	1.20	0.58-2.49	0.618	
Enrollment in health i	nsurance	\sim					
No	Reference						
Yes	2.34	1.21-4.55	0.012*	1.40	0.59-3.28	0.439	

*statistically significant at the level of p-value < 0.05

DISCUSSION

The result of this study showed that the status of completion of the continuum of care (CoC) for maternal health services among participants was found at 75.0%. However, analysis of NDHS (2016) data regarding CoC in maternal health services among women showed only 47.5% ⁽⁴⁾. The difference in these two studies might be due to differences in the study setting, inclusion criteria. This study is conducted in Pokhara metropolitan and its surrounding rural municipalities. However, later one includes the national representative data obtained for Nepal Demographic Health Survey (2016). Similarly, this study included women having less than one year of the child preceding the survey as study participants. However, in NDHS, 2016 women having less than five years of children were interviewed to gather maternal-child health information. However it was higher than other study conducted by different country like Cambodia, Egyptian, Enemy district, northwest Ethiopia, Bangladesh, South Africa, Pakistan, sub-Saharan country, West Gojjam Zone Ethiopia, Tanzania, Gamo Zone Southern Ethiopia, Ethiopia, Ghana, and Lao PDRRespectively^(5-15,17). The possible reason could be due to variation in study design and variation in the source of data and may be due to regional differences in terms of health services accessibility and socioeconomics.

Bivariate analysis between the dependent and independent variables showed religion, ethnicity, education, occupation, wealth index, access to mass media, health insurance, women autonomy, mode of travel, distance from the health facility, family support, advised for PNC checkup, four or more ANC visits, and mode of delivery, family support was a significant factor for the completion of CoC in maternal health services.

Multivariable analysis between dependent and independent variables showed only two variables (four or more ANC visits and advised for PNC checkup) as significant factors for completion of the continuum of care in maternal health services.

Women who had four or more ANC visits were about eighteen (AOR: 18.00, 95% CI: 7.38-43.93) times more likely to completion of the continuum of care for maternal health services compared to women with less than four ANC visits. The result is similar to a previous study conducted in Nepal and Cambodia were women who had four or more ANC visits were more likely to CoC for maternal health services compared to women with less than 4ANC visits (5,18)It is because when women received four or more ANC visits they become better informed about pregnancy and more likely to recognize the importance of skilled delivery care.

Similarly, another finding is that advised for PNC checkup was about three (AOR=3.07, 95% CI: 1.49-6.32) times more likely to completion of CoC for maternal health services. The possible region might be during the ANC visits of women go to health facility the health personnel should provide adequate advice for a PNC checkup so women should be more aware and received the PNC checkup. There should not find an appropriate literature review for comparison.

The limitation of my study, which includes only one PNC visit and another limitation was recalled bias may have occurred as women had forgotten ANC visit so it should be minimized by seeking their ANC cards if possible.

Conclusion

From the study, it is concluded that a large proportion (75%) of women in the Kaski district were completed the CoC for maternal health services. Multivariable analysis, after adjustment of all covariates, four and more ANC visits, and advice for PNC visits were found significant factors for CoC for maternal health services. It is recommended to the Concerned health facility should provide adequate information on the ANC, institutional delivery, and PNC visits and adequate counseling should be done in each visit.

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