

Prevalence and Determinants of Institutional Delivery Service up take among Women in Farta District, Northwest Ethiopia

Tseganesh Gedilu, Desta Debalkie* and Tesfaye Setegn

College of Medicine and Health Sciences, School of Public Health, Bahir Dar University, Ethiopia

*Corresponding author: Desta Debalkie, College of Medicine and Health Sciences, School of Public Health, Bahir Dar University, Ethiopia, Tel: +215910477921; E-mail: destad2a@gmail.com

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Abstract

Background: Although institutional delivery is the corner stone to reduce maternal death and improve child health, institutional delivery in Ethiopia is the lower in the world where only 26% of women attained skilled delivery. This study aimed to identify factors determining the utilization of delivery services among women in Farta District.

Method: A community based cross sectional study design was conducted from March 1-30, 2017. Multistage sampling was used to select women. Data were collected from a sample of 779 women using structured questionnaire, entered in to EPI-info version 7.2, and analysed by SPSS Version 23. Frequencies, percentages and summary statistics were computed to describe the study population. Logistic regression was computed to identify the associated predictors with skilled delivery service utilization. Statistical level of significance was declared at $p < 0.05$.

Results: The prevalence of institutional delivery was 64.4% (95% CI=61, 67.4). A multivariable logistic regression model indicated that family size, availability of transport, planned pregnancy, information about place of delivery, participation of women monthly health conference (PWMHC), information about exempted service, and having antenatal care (ANC) follow up during their last pregnancy were found to be significantly associated with institutional delivery service utilization.

Conclusion: The attendance of women for institutional delivery care is good but below the national plan. Maternal care information, women monthly conference and behavioural change for planning pregnancy should be taken due attention to mobilize mothers towards skilled birth attendance. Allocation of more resource to the program and increasing availability of transportation during labor is also commendable. Improving mother's ANC follow up attendance in resource limited regions is warmly suggested.

Keywords: Utilization; Institutional delivery service; Pregnancy; Women; Factors; Northwest

Abbreviations CI: Confidence Interval; ANC: Ante Natal Care; PWMHC: Participation of Women Monthly Health Conference; MMR: Maternal Mortality Rate; EDHS: Ethiopian Demographic and Health Survey; SPSS: Statistical Package for Social Science; SD: Standard Deviation; TBAs: Traditional Birth Attendants; AOR: Adjusted Odds Ratio; COR: Crude Odd Ratio

Background

Globally, 303,000 mothers died of complications of pregnancy and child birth [1]. In 2015, maternal death related to delivery accounted to 830 per day [2]. Approximately, 99% of the estimated global maternal deaths occurred in developing countries. The Sub-Saharan Africa alone accounting for roughly 66%. The overall maternal mortality rate (MMR) in developing regions was found to be 239 which are roughly 20 times higher than that of developed regions. In Ethiopia, MMR was estimated to be 412/100,000 live births [3].

A woman's death affects the survival of her infants, family's well-being and society as a whole. When a woman died off, her family is less able to care for itself, and forfeits any paid or unpaid wages. Her death

increased the chances of her family facing poverty and malnutrition [4].

Maternal deaths are caused by direct and indirect causes. From the total maternal mortality, direct obstetrics particularly haemorrhage (27%), hypertensive diseases of pregnancy (14%) and sepsis (11%) continue to be the leading causes of maternal deaths. This was as a result of poor utilization of institutional delivery and high practice of home delivery. However, around 16-33% of all maternal deaths can be averted through primary and secondary prevention of complications during labor and delivery [5].

Though global institutional delivery service has been seen an improvement from the 1990s coverage, there are still greater disparities across the regions. Worldwide about 81% and 61% of skilled birth attendants were found in the urban and rural respectively. Whereas, in Sub Saharan countries, the resource limited, an approximate of 75% of urban and 40% of the rural births taken place at health facilities [6]. In Ethiopia, institutional delivery service is found to be the lowest in the world. Nearly 75% of them had taken place at home without the assistance of skilled personnel. Only a significant amount of deliveries (79%) were attained in urban facilities and the rural were in the lowest percentages (21%) [3].

Cognizant of low institutional delivery, the government of Ethiopia has been striving to increase skilled birth attendance. In this regard the government has been implementing different structural and functional innovative schemes at district and grassroots level in order to escalate the number of mother giving birth in health facilities. Among the interventions made are promoting women to be enrolled in the women development army (for behaviour change communication among women), providing ambulances to health facilities (for transportation during labor), mobilizing the community to have traditional ambulance “kareza” in areas where there is no ambulance vehicles for transportation, preparing maternal waiting homes inside health facilities and letting the mother practice cultural domains (coffee, tea and porridge ceremony) in the premises of health facilities during labor [7]. Moreover, the government of Ethiopia provides services to pregnancy and pregnancy related problems free of charge that makes every pregnant woman can get the service freely.

In spite of this amount of efforts has been made, institutional delivery service utilization remains very low nationally. The reality might be due to the fact that lack of evidences which are able to identify the possible drawbacks in the implementation of those efforts to increase institutional delivery. This study aimed to identify barriers for attending skilled birth attendants in order to develop a comprehensive and multidisciplinary approach to expand institution delivery services in resource limited settings. We also aimed to estimate the proportion of institutional service delivery up take in Farta district South, North West Ethiopia.

Methods

Study design and study setting

A community based cross-sectional study design was implemented in Farta district, Northwest Ethiopia from March 1-30, 2017. Farta district is found in South Gondar Zone. The district has 43 kebeles (smallest administrative unit), 10 health centers, two treatment centers and 54 health posts. A total 56,579 women in the reproductive age (15-49 years) found in the area [8]. The estimated annual deliveries during 2016 were 7537 [9].

Sample size determination

Sample size was calculated using single population proportion formula based on the following assumptions: 61.2% proportion of skilled delivery [10], 5% degree of precision, design effect of 2, 95% level of confidence and non-response rate of 10%. The estimated total sample size was 802.

Sampling procedures and technique

Multistage sampling was employed to select 10 Kebeles. After grouping Kebeles into strata, one from urban and nine kebeles from rural were identified by simple random sampling technique. Women who gave birth during the last 12 months at any of those ten Kebeles were recruited. We took up proportional allocation of study participants to each Kebele per size. Systematic random sampling with sampling interval of two was used to pick respondents.

Operational definitions

Institutional delivery: is any delivery assisted by skilled birth attendants in the health facility excluding health post in the context of indigenous practice, measured by a Yes and No questions.

Decision making power: is the ability of the woman to decide her place of delivery without any influence.

Data collection and analysis

Structured questionnaires were adapted [11] according to the objective of the study, translated into Amharic followed by back translation and pretested to check for accuracy of the tool. A house to house survey was under taken from mothers who gave birth in the last 12 months.

Face to face interview was administered using Amharic version structured questionnaire. Ten data collectors and 2 supervisors were recruited and trained to conduct data collection. The variables considered during data collection were socio-economic and demographic variables (age, education, residence, occupation, monthly income and expenditure), obstetric factors (use of ANC, parity, plan to deliver at health facility level, information about place of delivery, information about danger signs of pregnancy, and planned pregnancy) etc. The data were entered into EPI info version 7 database and then transferred to SPSS version 20 statistical package for analysis (SPSS). Frequencies, proportion and summary statistics were used to describe the study population in relation to relevant variables. The results were presented in the form of tables. Both bivariable and multivariable logistic regression was used to identify associated factors with the outcomes of interest. The degree of association between independent and dependent variables was assessed by using adjusted odds ratio (AOR) with 95% confidence interval. Those variables with p-value of less than 0.05 in the multivariable analysis were considered as statistical significant.

Ethical considerations

The study was approved by Ethical Review Committee of Amhara regional health bureau after supportive letter has been taken from Bahir Dar University. Permissions were obtained from Zonal and district health department. Both verbal and written consent was obtained from each respondent. Each study participants was informed about the purpose and anticipated benefits of the research project. They were also knowledgeable on their full right to refuse, withdraw or partially reject part or all of their part in the study. Privacy and confidentiality was guaranteed throughout the study.

Results

Socio-demographic variables and proportions of institutional delivery

Out of the 802 eligible study subjects, 779 consented to be enrolled into the study. The response rate was 97.1% and the mean age was 30.2 (SD= ± 6) years. The majority of mothers who gave birth in last year (88.7%) were from rural areas. Fifty nine percent 464 (59.6%) of them did not have formal education. The mean family size was estimated to be five (SD= ± 2). The percentage of urban mothers who gave birth in one year in the health institution was 51(58%) (Table 1).

Variable	Institutional delivery		Total (%)
	Yes (%)	No (%)	
Residence			
Urban	51 (58)	37 (42)	88 (11)
Rural	451 (65)	240 (35)	691 (89)
Age (year)			
15-19	18 (4)	5 (2)	23 (3)
20-24	97 (19)	21 (7.5)	118 (15)
25-29	152 (30)	46 (16.5)	198 (25)
30-34	132 (27)	83 (30)	215 (28)
>35	103 (20)	122 (44)	225 (29)
Educational status			
No formal education	259 (52)	205 (74)	464 (60)
Elementary	157 (31)	54 (19.4)	211 (27)
Secondary and above	86 (17)	18 (6.6)	104 (13)
Husband education			
No formal education	234 (49)	191 (74.3)	425
Elementary	146 (30)	47 (18.3)	193
Secondary and above	101 (21)	19 (7.4)	120
Occupation			
House wife	359 (52)	334 (48)	693 (87)
Others*	79 (92)	7 (8)	86 (13)
Husband's occupation			
Farmer	384 (54.6)	277 (45.4)	611 (83)
Others*	97 (82)	30 (18)	127 (17)
Family size			
<5	344 (76)	109 (24)	453 (58)
>5	158 (48)	168 (52)	326 (42)

Table 1: Socio-demographic characteristics of women who gave birth in the last 1 year, Farta district, Northwest, 2017 (n=779); *Governmental employee, private employee, farmers, merchants, students, daily laborers

Obstetric and maternal related characteristics of the respondents

Adolescent pregnancy before the age of 20 years was vastly prevailing (72.4%) in the district. Majority of women (67.6%) who gave birth in the last one year were married before their 18 years of age. Around seventy five (74.8%) percentage of women attained ANC for their last pregnancy. Only 38.9% of those who attend ANC had visited ANC 4 and above and majority of them (84.2%) were informed about health facility delivery service during their ANC follow-up. About

78.9% of mothers had planned pregnancies. Out of the total respondents, (78.2%) gave births between one and four in their reproductive life time. Majority of them (53.6%) did not have any formal-education. The proportion of pregnant women who gave birth in one year in health facility was 64.4% (95% CI: 61.0, 67.4) (Table 2).

Variables	Frequency	Percentage
Age at first marriage		
<18 years	512	67.6
>18 years	245	32.4
Age at first pregnancy (years)		
<20years	564	72.4
>20	215	27.6
Parity		
1-4	609	78.2
>5	170	21.8
History of abortion (life time)		
No	726	93.2
Yes	53	6.8
Was last pregnancy planned		
Yes	615	78.9
No	164	21.1
ANC during last pregnancy		
Yes	583	74.8
No	196	25.2
Number of ANC visits		
<4	356	61.1
>4	227	38.9
Counselling on danger signs during ANC visits		
Yes	496	63.7
No	283	36.3
Informed about place of delivery during ANC visits		
Yes	491	84.2
No	92	15.8
Place of delivery		
Home	277	35.6
Health facility	502	64.4
Availability of transport		
Yes	399	51.2

No	380	48.8
Type of transport available		
Ambulance vehicle	260	65.2
Traditional ambulance	129	32.3
Public transport	10	2.5
Information about exempted service		
Yes	558	71.6
No	221	28.4

Table 2: Obstetrics related characteristics of respondents, Farta district, North West Ethiopia 2017 (n=779).

Institutional delivery related innovative practice, decision making and service utilization

Around 66.1% of respondents participated in PWMHC and more than half of them (84.3%) gave birth of their last child at health facility. The participation of pregnant women in developmental army accounted to 491 (63%). Of mothers participated in developmental army, 381 (77.6%) were delivered at health facility. Majority of women (80.2%) who had information about the presence of maternal waiting home attained skilled birth attendants. More than half of women (62.5%) had been discussed about their place of delivery with their husband. The majority of decisions (92.9%) to have birth at health institutions were made by both mother and husband. Only 33% of mothers alone made final decision for where to deliver. Around 84.9% of them chosen health institution for delivery (Table 3).

Variable	Place of delivery		
	Health facility	Home	Total
	No (%)	No (%)	No (%)
Participation in pregnant women monthly health conference			
Yes	434 (84.3)	81 (15.7)	515 (66.1)
No	68 (25.8)	196 (74.2)	264 (33.9)
Participation in women developmental army			
Yes	381 (77.6)	110 (22.4)	491 (63)
No	121 (42)	167 (58)	288 (37)
Information about the presence of maternal waiting home at health facilities			
Yes	451 (80.2)	111 (19.8)	562 (72)
No	51 (23.5)	166 (76.5)	217 (28)
Information about the presence of porridge and coffee ceremony			
Yes	439 (77.8)	125 (22.2)	564 (72.4)
No	63 (29.3)	152 (70.7)	215 (27.6)

Discussion with partner about place of delivery			
Yes	392 (85)	69 (15)	461 (62.5)
No	89 (32.1)	188 (67.9)	277 (37.5)
Final decision maker on place of delivery			
Mother her self	129 (84.9)	23 (15.1)	152 (33)
Husband	38 (83)	8 (17)	46 (10)
Mother and husband jointly	169 (92.9)	13 (7.1)	182 (39.5)
Other family members	56 (69)	25 (31)	81 (17.5)

Table 3: Innovative practice, decision making power and place of delivery in Farta District, North West Ethiopia, 2017 (n=779).

Self-reported reasons of mother's for home and health facility delivery

The most frequent reason that mothers were not attending facility to have birth was due to the assistance they got from trained traditional birth attendants (TBAs) (54.5%), perceived comfort of home delivery (58.8%) followed by previous practice (37.5%). Other reasons included getting close guidance and attention from families (36%), perceived disliking of services provided in health facilities (30%) and poor welcoming approaches of delivery professionals. Reasons for attending institutional delivery were perceived quality of services (77.5%), information exposure about facility delivery (58.4%), possibility of having ritual practices like porridge and coffee ceremony (17.7%) and bad experiences of delivering at home (17.5%) (Table 4).

Variables	Frequency	Percentage
Assistance during home delivery		
Trained TBAs	151	54.5
Untrained TBAs	86	31
No one	6	2.2
Family members or relatives	34	12.3
Reason for home delivery		
I feel more comfortable in giving birth at home	163	58.8
Close attention from my families and relatives	100	36
It is my usual practice	104	37.5
I don't like the services provided in health facilities	83	30
I have bad experience in giving birth at health facility	20	7.2
Un well coming approach of healthcare workers	58	20.9
The health facility is too far from my house (>30 min)	9	3.2
Labor was urgent to reach to health facility	38	13.7
Influenced by my husband not to go to health facility	23	8.3
Other family members prefer to deliver at home	22	7.9

Reasons for health facility delivery		
To get better service	389	77.5
Bad experience from past experiences	88	17.5
I was informed to deliver in health facility	298	59.4
The facility was closer to my home (<30 min)	29	5.8
Presence of maternal waiting home at the facility	60	12
Possibility of having ritual practices like porridge and coffee ceremony	89	17.7
Birth outcome of last birth		
Alive	770	98.8
Still birth	9	1.2

Table 4: Self-reported reasons of mothers for home and facility delivery, Farta district, Northwest Ethiopia, 2017 (n=779).

Bi-variable analysis of factors associated with institutional delivery service utilization

The bi-variable logistic regression model revealed that skilled birth attendance had significant association with the availability of transport, family size, planned pregnancy, ANC visit, information about place of delivery, participation on pregnant women monthly health conference, information about exempted service of maternal health service, educational status, age at first pregnancy, information about danger sign and maternal waiting home. However skilled birth delivery service utilization had no significant association with residence (Table 5).

Multivariable analysis of factors independently associated with institutional delivery service utilization

After controlling for possible confounders using a multivariable logistic regression model, women with transport access were more likely to deliver at health facility than their counter parts (AOR=3.1; 95% CI: 1.71, 5.55). Mothers' family size less than five were more likely to give birth at health facility than those who had five or more children (AOR=2.5; 95% CI: 1.15, 5.23). Mothers who planned pregnancy were more likely to deliver at health facility compared to who did not plan pregnancy (AOR=3.4; 95% CI: 1.53, 7.50). Mothers who had followed ANC were more likely to have birth at health facility compared to their counter parts (AOR=2.4; 95% CI: 1.21, 4.90). As compared to those who have no information about place of delivery, women who have an information about where to deliver were more likely having birth at health facility (AOR=9.3; 95% CI: 4.26, 20.55). Women who attend pregnant women monthly health conference were more likely to deliver at health facility than those who have no exposure to conference (AOR=6.6; 95% CI: 3.22, 13.42). Mothers having information about pregnancy exemption were more likely to deliver at health facility than their counter parts (AOR=7; 95% CI: 3.24, 14.5) (Table 5).

Variable	Institutional delivery		Crude Odds Ratio [COR (95% CI)]	Adjusted Odds Ratio [AOR (95% CI)]
	Yes	No		

Residence				
Urban	51	37	1	
Rural	451	240	1.4 (0.87, 2.14)	0.69 (0.12, 2.8)
Educational status of respondents				
No formal education	259	205	1	
Elementary	157	54	2.3 (1.6, 3.30)*	2.5 (0.9, 7.05)
Secondary and above	86	18	3.8 (2.2, 6.5)*	2.8 (0.6, 12.75)
Husband's occupation				
Farmer	384	227	1	
Others***	97	30	1.9 (1.2, 2.97)*	1.3 (0.27, 6.2)
Family size				
<5	344	109	3.4 (2.5, 4.6)*	2.5 (1.15, 5.23)*
>5	158	168	1	
Age at first pregnancy				
<20	350	214	1	
>= 20	152	63	1.5 (1.05, 2.07)*	0.8 (0.3, 1.95)
Was last pregnancy planned				
Yes	457	158	7.7 (5.19, 11.3)**	3.4 (1.53, 7.5)**
No	45	119	1	
ANC visit during last pregnancy				
Yes	433	150	5.3 (3.76, 7.5)*	2.4 (1.2, 4.9)*
No	69	127	1	
Information about danger signs				
Yes	383	113	4.7 (3.4, 6.4)*	2.6 (0.97, 6.7)
No	119	164	1	
Information about place of delivery				
Yes	413	78	19.1 (10.9, 33.1)*	9.3 (4.3, 20.6)*
No	20	72	1	
Availability of transport during labor				
Yes	336	166	6.9 (4.9, 9.6)*	3.1 (1.7, 5.6)**
No	63	214	1	
Information about exempted service				
Yes	461	97	20.9 (13.9, 31.2)*	7.0 (3.24, 14.5)**

No	41	180	1		
Participating in pregnant women monthly health conference					
Yes	434	81	15.4 (10.7, 22.2)*	6.6 (3.22, 13.4)**	
No	68	196	1		
Information about maternal waiting home					
Yes	451	111	13.2 (9.1, 19.3)*	1.7 (0.55, 5.4)	
No	51	166	1		
Information about coffee and porridge ceremony					
Yes	439	125	8.5 (5.9, 12.1)*	0.6 (0.19, 1.8)	
No	63	152	1		

Table 5: Factors associated with institutional delivery service utilization in Farta district, South-Gondar zone, North West Ethiopia, 2017 (n=779).

Discussion

Having safe and skilled delivery is one of the corner stone able to reduce maternal death and improve child health. In this study, the prevalence of institutional delivery service utilization was 64.4%. It was consistent with other studies conducted in Ghana (63.3%) [11] and Goba (61.2%) [9], but; higher than the studies in Nepal (55%) [12], Tanzania (56%) [13], Banja (15.7%) [14], Sidama (4.9%) [15], Dangila (18.3%) [16] and Ethiopian demographic and health survey (EDHS) 2016 (26%) [3]. The possible explanation for the discrepancy could be the due commitment shown by the government to improve institutional delivery service utilization is high: assigning midwives in every health center and making the facility accessible to where mothers live. Maternal health is one of the health extension packages given attention as a strategy in the millennium development goals. In addition, it was lower than a study conducted in Arba Minch (73.2%) [17] and Debre Berhan (80.2%) [18]. This could be the fact that differences of educational status and population composition where majority (88.7%) of the study participants in the current study was rural women whose educational background was either no or primary level that made mothers less aware about institutional delivery.

The probability of having birth in health facilities was influenced by a number of predictors. Among them women's socio-demographic variables, obstetrics and maternal factors, health facility related factors, and adoptions of innovative interventions are the most important one.

In our study, one of the most vital determinants of skilled delivery was the accessibility of transport. Mothers with sufficient transport access had strong odds of having birth with the help of skilled health professional compared to their counter parts, similar to other studies [19,20]. The availability of free transport like ambulance from the government during labor might increase the confidence of women to give birth at health facility. However, the variable nature of where mothers live (urban versus rural) is not significantly associated with institutional delivery service meaning physical accessibility with

minimal cost of transportation did not come up with improved delivery care utilization.

Similar to our findings, the number of children a mother had was significantly associated with institutional delivery service utilization in studies conducted in Lemu district [21] and Kenya [19] which could probably women with larger number of household members would be busy and have no extra time to go to health facility for ANC services and other maternal care.

Preconception about health and healthcare before and between pregnancies is the hidden milestones for mothers should consider increasing the likelihood of getting a healthy child. Planned pregnancy is likely seeking professional care and increased mothers facility attendance for delivery to have better maternal and child health. In support of the aforementioned outcome, planned pregnancy is associated with institutional delivery service utilization. Those who plan to have a child were more likely to utilize institutional delivery than their counter parts. This was in line with study conducted in Wolaita-Dawuro [21] and Hadiya [22].

ANC is one of the strategies given due attention to improve health of pregnant women. It is an opportunity to provide appropriate information for the mothers about where to deliver and to decide the right place of delivery. Similar to previous literatures [17,23], women who had ANC follow up during their last pregnancy were more likely to deliver at health facility than those who had no ANC follow up.

Information about place of delivery was found to be a prominent factor of institutional delivery. In the study, we found that women who have information about place of delivery were more likely to deliver at health facility than their counter parts. This was in line with a study conducted in Cheha [24] that counselling at ANC about where to deliver was probably increasing mothers attendance for skilled delivery.

In Ethiopia with the aim of community participation, women are arranged in to women developmental army providing great responsibility to engage in maternal and child health alongside with health extension workers [25]. Womens' group intervention is a community based initiative through which rural women form groups and meet regularly discussing on maternal health issues to come up with locally available solutions. It is one of the promising community interventions for maternal health in rural areas with low access to health [26]. Mothers monthly held conference and group are both cost-effective and a realistic way of reducing maternal deaths and improve birth outcomes rapidly on a large scale. A systematic review conducted witnessed that community mobilization had strong association with facility based deliveries [27,28]. This was strongly supported by our results that women who engage in monthly held group discussion on maternal health were more likely to deliver at health facility than those who did do not involved in the group. The government of Ethiopia has strived to improve institutional delivery and tried to introduce interventions that hasten skilled delivery like adaptation of cultural practices at facility level, making maternal care free of charge, availing maternal waiting home at health facility, and facilitation of transportation for pregnant women during labor. These interventions were largely explained by the findings of this study. Women who have information about exempted maternal health care service provided at health facility were more likely to attain skilled professionals as compared to the counter parts. This was similarly reported by a study conducted in South Omo and Addis Ababa that women preferred health facility since the service is provided free of charge [29,30]. If the

service is free of charge, both the poor and the rich will access the service equally and women will develop confidence to go to health facility for delivery. This study was not carried out without any limitations. Even if we tried to minimize introduction of bias, there might be recall bias since women who gave birth within one year duration might fail to recall ever thing. In addition, in cross-sectional study; factors do not establish temporal relationship.

Conclusion

Institutional delivery service utilization is relatively low as compared to the national plan. Maternal care information, women monthly conference and behavioural change for planning pregnancy should be taken due attention to mobilize mothers towards skilled birth attendance. Allocation of more resource to sustain the program and increasing availability of transportation during labor is also commendable. Improving mother's ANC follow up attendance in resource limited regions is warmly suggested. Women's engagement in monthly held maternal discussion should be promoted further since it is cost-effective and a realistic way of reducing maternal deaths and improving birth outcomes rapidly.

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Ethics Approval and Consent to Participate

All study procedures were approved by University of Gondar, institute of public health Institutional Review Board (IRB).

Availability of Data and Material

All data and materials are available related to this article for future review on request.

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