

Complementary Feeding and Associated Factors Among Mothers Having Children 6-23 Months in Yaya Gulale District, Oromia, Ethiopia from June 15 to June 30/2019

Godana Arero (✉ godanag769@gmail.com)

Adama Science and Technology University

Mesay Zewdie

Adama Science and Technology University School of Agriculture

Research

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Abstract

Background

Complementary feeding is the provision of nutrient containing foods or liquids other than breast milk that includes both solid foods and semisolid foods. There is limit study conducted in this area, so to know existing gap the topic was selected.

Objective

To study complementary feeding and associated factors among mothers who had children 6–23 months in Yaya Gulele district, Oromia, Ethiopia, 2019.

Method

A cross-sectional study design was conducted among 558 mothers who had children with 6–23 months of age. Simple random sampling was used to select the required sample size. Pretest was conducted on 5% sample size. Data were cleared using Epi-Info version 7 & analyzed by SPSS version 20. Result was presented by using percent, frequency, tables and graphs. Crude & adjusted odds ratio were done along with 95% CI and level of statistical significance was declared at p-value < 0.05.

Result

A total 558 individuals were participated in study with 98.2% response rate. Level of knowledge on complementary feeding was (79.57%). Maternal educations: primary, secondary and above (AOR = 3.59,95%CI:1.264–8.93, AOR = 3.109,95%CI:1.12–8.62), antennal care status: 1–2 visit,3 & above (AOR = 2.4,95%CI:1.13–5.3, AOR = 4.78,95%CI:2.197–10.42) respectively, place of delivery (AOR = 8.5,95%CI:4.41–16.50), post-natal care:1,2 and above visit (AOR = 2.6,95%CI:1.12–6.49,AOR = 3.6,95%CI:1.72–7.74); watching TV (AOR = 3.19, 95%CI:1.1–9.45) and listening radio (AOR = 2.32,95%CI:1.17–4.57) were independent predictor of level of good maternal knowledge on complementary feeding.

Conclusion and recommendation:

Educating the mothers through mass media and house to house by health extension workers is recommended to enhance knowledge of complementary feeding.

Background:

Complementary feeding is defined as the provision of nutrient containing foods or liquids other than breast milk that includes both solid foods and semisolid foods. The transition from exclusive breastfeeding to family foods, referred to as complementary feeding, typically covers the period from 6 to 18-24 months of age, and is a very vulnerable period(1, 2). The first 1000 days (from conception to 24

months of life) are the critical window of opportunity for improving child nutrition. Exclusive breast feeding for the first six months and continued breastfeeding with adequate complementary feeding can prevent 13% and 6% of the annual under-five mortality respectively. Exclusive breast feeding and complementary feeding are put at the first and third rank respectively out of 15 preventive child survival intervention strategies. Even though all these potential benefits, only about two-fifths and two-thirds of infants worldwide are exclusively breastfed and introduced to solid foods in a timely manner respectively(2-4). The second half of an infant's first year is found to be a vulnerable time as breast milk alone is no longer sufficient to meet his/her nutritional requirements. Inadequate food intake together with high rates of infectious diseases, are the proximate causes of under-nutrition during the first two years of life(5). Under-nutrition accounts for 45% of under-five mortality in developing countries, amounting to more than 3.1 million deaths each year. It prevents children from reaching full growth and development potential. In addition to this, it results in irreversible long-term effects in later life due to lack of knowledge and incorrect practice of CF(9). Currently, poor IYCF practice and low knowledge on CF is identified as a significant contributor to under-nutrition worldwide(10) and study conducted in India had showed that, 16% were not started on complementary feeding at all, and only 17.5% received complementary feeding from 6 months. Of those who were started complementary feeding. Only 3.5% mothers started complementary feeding at proper time, with adequate quantity and proper consistency and only 8% of mothers had proper knowledge on complementary feeding(11).

In Konaseema region, only 42.0 % of mothers had the knowledge that complementary feeding should be started at 6 months and 4.2 % had no idea about complementary feeding(12).

Among the top 10 countries with highest under-five mortality, 5 of them are from Africa. Similarly, 23 out of 40 countries with child stunting prevalence of 40% or more are in Africa due to lack of knowledge and inappropriate practice(5). Almost half (45%) of all children's deaths are associated with malnutrition, while children in sub-Saharan Africa are more than 14 times likely to die before the age of 5 than children in developed regions(8). Under-nutrition causes stunting, underweight and wasting due to insufficient knowledge and inappropriate CF. In Nigeria, the 2013 DHS reported that 50% of infants are given complementary food too early due to lack of knowledge about CF (13) and study conducted in Logas state revealed that, only 14.9% of the respondents had good knowledge of complementary feeding(14) In Ethiopia, study done in Bahardar city revealed that, only 28.7% of mothers had sufficient knowledge about CF(16) and also maternal knowledge on CF was 10.6%, 40%, 50.6%, 51%, 53.8% and 62.8% in Gorche district, Horo Guduru, Damot Waydie, Northwest Ethiopia, Adea woreda and Northern Ethiopia respectively(25-30). Inappropriate complementary feeding practices due to lack of knowledge, remain as major public health problem in many developing countries where many children are victim of the malpractice(2). Less than one-third of 6-23 months old children met the minimum criteria for dietary diversity, and only 50% received the minimum number of meals. When these indicators combined, called as the minimum acceptable diet, only 21% of children aged 6-23 months met the minimum criteria(3). Inappropriate complementary feeding continue to make children to be vulnerable to irreversible outcomes of stunting, poor cognitive development and significantly increased risk of infectious diseases In Ethiopia, many studies witnessed that complementary feeding is usually initiated late and the feeding

is notably dependent on monotonous cereal based foods and only about half of children receive complementary foods at 6-9 months of age and only 4% of children ages 6-23 months are feed appropriately based on WHO recommended IYCF and only 40% were initiate complementary feeding timely while 60% of mothers were not timely initiated(15). There are limited studies on knowledge about complementary feeding. The findings of this study will be useful for the health planning and policy to improve CF knowledge.

Conceptual Framework for maternal knowledge on CF. Developed by investigator, 2019

Methods:

The purpose of study was to investigate status of complementary feeding and its associated factors among mothers who had children 6-23 months in the Yiya Gulele District from June 15 – June 30/2019. Community based cross-sectional study design was conducted. The source population was all mothers who had child aged 6-23 months living in Yaya Gulale district. Study population was all mothers who had child aged 6-23 months living in selected kebeles. Study subjects were those mother who child had aged 6-23 months and give full information for research team. Inclusion criteria was all mothers who had child aged 6-23 months and resident of district more than 1 year and exclusion criteria was mothers who were seriously sick, mental health problem or difficult to give an information to research team.

Sampling Procedure: All Kebeles were stratified into rural and urban because of the presence of difference among study participants based on their residence (1 urban and 17 rural kebeles). In the first stage, one urban kebeles and six kebeles (30%) from the rural kebeles was selected by using simple random sampling (lottery) methods. The sample sizes were distributed to each selected kebeles proportional to household size of the kebeles. Sampling frame was prepared depending on health post family folder and the interval was determined by the division of total household with mother who had child aged 6-23 months to required sample, which results in an interval of three household. Then systematic sampling was used to select study subject from the random start and mothers with child aged 6-23 months in the selected household was selected and interviewed. For eligible participant who was not found at home, the interviewers revisited the household two times at different time intervals and when interviewers failed to get the eligible participant, the household was registered as non-response.

Schematic presentation of sampling procedure, maternal knowledge on complementary feeding and associated Factors in Yaya Gulale district, Oromia, Ethiopia, 2019:

Sample Size Determination:

The sample size is determined by using single population proportion formula.

$$n = \frac{(Z_{1/2})^2 p(1-p)}{d^2}$$

Based on the following assumptions: 95% confidence level, prevalence of expected knowledge on CF was 87% from study conducted in Abyi-Adi town, 5% margin of error, 10% non-respondent rate.

n= sample size

z = critical value = 1.96 for 95% CI

p = prevalence of expected knowledge on CF d = precision (marginal of error) b/n the sample and the proportion 4% =0.04

$$n = ((1.96 \times 1.96) \times 0.87 (0.13) / (0.04 \times 0.04)), n = 273$$

Considering non-response rate 10%

As the target population is less than 10,000 (i.e. 3253, we need to apply correction formula)

[Please see the supplementary files section to view the formula.]

Where, nf = required sample size when target population is < 10,000

$$N = \text{Population target (3253)}$$

Therefore, n = 273

$$1 + \frac{273}{3253}$$

$$= \frac{3253 + 273}{3253}$$

$$= 252$$

For possible non-response during the survey the final sample size is increase by 10% to n = 252+252*10% which was 252+25 = 277, using design effect= 2, nf= 277*2=554

Sample size calculation by using stat calc for second objective for the study that will be conducted in Yaya Gulale district, Ethiopia from June 15 - June 30/2019:

Objective	Assumption						Reference
	Variable	Exposed	Unexposed	Power	AOR	Sample size	
	Maternal educational status	83.6	67.1	80	2.5	488	Y.Mulugeta,2017
	Urban settlement	44.3	27.4	80	2.11	568	Duna Ayana et al,2017
	History of PNC	30.2	13.4	80	2.8	432	Ergib Mekbib et al,2014
	Maternal educational status	95	83.2	80	3.84	506	Ergib Mekbib et al,2014
	History of ANC	80.1	62.6	80	2.4	418	Y.Mulugeta,2017

Generally, sample sizes were calculated for the first and the second objectives and the largest sample size was found to be 568 from the second objective.

Data Collection Procedure: Data was collected using structured questionnaire using face to face interview. Pretested was conducted before main study commence taking 5% of sample to validate questionnaire. The questionnaire was developed from previous literatures and then modified to the study objectives. Questionnaires were translated in to local language (Afan Oromo).

Data Quality Control: Data collectors and supervisors were taken training for one day on how to select study participants and other technical procedures. Pretesting was conducted to ensure questionnaires were ethical acceptable by taking 5% of from the total sample size prior to data collection. The collected data was rechecked for completeness and consistency by supervisors and principal investigators before transferring in to computer software. Principal investigator was supervise daily to check the completeness of the questionnaire and consistency of related data as well as double data entry was employed to verify whether the data was properly entered.

Study Variables: Dependent Variable was complementary feeding. Independent Variables were socio-demographic characteristics of the mothers such as mothers' age, educational status,

occupation, husband educational status, husband occupation and family size. Health Care service such as ANC, Place of delivery and PNC and Source of Information

Data Analysis and Management:

Data was checked for incompleteness, inconsistency, edited, coded. Then data was entered by using EP Info software version 7 for cleanness and analyzed by using SPSS software version 20. Model goodness of fit was checked by Hosmer-Lemeshow goodness of fit. Descriptive statistics were used to describe status of complementary feeding by measuring mothers knowledge using Likert scale questionnaire. Mothers' knowledge on Complementary Feeding was measured based on a two scales ('1', '0'). A score of '1' was good knowledge while '0' score was poor knowledge on subject matter. Then, when the mothers were answer more than 50% above, it decided that she has good knowledge. When she answered less than 50% she had poor knowledge (19). Binary logistic regression was used to compute association of the dependent variable with independent variables using 95%CI taking adjusted odd ratio and p-value <0.05 as statistically significant. Variables with p-value less than 0.25 in the binary logistic regression analysis were entered to multiple logistic regressions to control confounders.

Results:

Five hundred fifty eight (558) mothers were participated in study with response rate 98.23%. Mean age of study participants were (29.31±4.63) years old. For detail socio-demographic and socio-economic characteristics look table 1 and 2 respectively.

[Please see the supplementary files section to view Table 1.]

Table 2: Socio-Economic Characteristic of study participant
(n=558).

		Frequencies	Percent
Educational status(558)	No education	328	58.8
	Primary	111	19.9
	Secondary & +	119	21.3
Occupation(558)	House wife	373	66.8
	Farmers	10	1.8
	Merchant	96	17.2
	Employee	14	2.5
	Daily labor	30	5.4
	Private	35	6.5
Income ETB(558)	≤500	81	14.5
	501-1000	228	40.9
	≥1001	249	44.6
Residence(558)	Urban	44	7.9
	Rural	514	92.1
Family Size	<3	273	48.9
	three to 5	243	45.3
	>5	43	7.5

Maternal Knowledge on complementary feeding:

Four hundred fifty two (79.57%) of respondents had knowledge about Complementary Feeding, 46 (82.8%) had knowledgeable on age to start Complementary Feeding. Four hundred eighty Two 482(86.4%) respondents had knowledge about use of Complementary Feeding.

Table 3: Maternal knowledge on Complementary Feeding

Variables	Categories	Frequencies	Percent
Definition of Complementary Feeding	Good	452	81
	Poor	106	19
Age to start Complementary Feeding	Good	462	82.8
	Poor	96	17.2
Use of the Complementary Feeding	Good	462	82.8
	Poor	76	13.6
Risk of starting Complementary Feeding early	Good	412	73.8
	Poor	146	26.2
Risk of starting CF late (after 6 or >8month)	Good	367	65.8
	Poor	191	34.2
Overall level of maternal knowledge	Good	396	71
	Poor	162	29

Table 3: Maternal knowledge on dietary intake

Variables	Categories	Frequencies	Percent
Ratio of cereal flour to legume flour	Good	335	60
	Poor	223	40
Porridge thickness for child age 6-23 months	Good	375	67.2
	Poor	183	32.8
Frequency of meal per day for 6-11 months	Good	440	78.9
	Poor	118	21.1
Frequency of meal per day for 12-23 months	Good	412	73.8
	Poor	146	26.2
Recommended feed per day for 6-11 months	Good	477	85.5
	Poor	81	14.5
Recommended feed per day for 12-23 months	Good	430	77.1
	Poor	128	22.9
Recommended age to start usual family diet	Good	261	46.8
	Poor	297	53.2
Recommended food groups included in child meal	Good	373	66.8
	Poor	185	33.2
Number of meal offered when child become ill	Good	281	50.4
	Poor	277	49.6

Factors associated with maternal knowledge on complementary feeding:

Table 6 shows detail of the self-explanatory regarding bivariate and multi-variate logistic regression analysis and the potential variables that significantly associated with good and poor maternal knowledge on complementary

Table 6: Bivariate & Multivariate Logistic Regression on Complementary Feeding (n=568).

Variables	Categories		COR(95%CI)	AOR (95%CI)
Educational status	Good	Poor		
No education	178	390	15.87(6.788-37.109)	3.359(1.264-8.930)*
Primary	562	6	14.74(6.29-34.53)	3.109(1.121-8.622)*
Secondary &+	562	6	1	1
Occupational status				
House wife	263	305	1	
Merchant	80	488	2.09(1.017-3.73)	
Farmer	5	563	0.41(0.12-1.47)	
Gov't employee	9	559	1.04(0.32-3.40)	
Daily Labour	10	558	0.20(0.09-0.46)	
Private Employee	28	540	1.67(0.71-3.94)	
Watching TV				
Yes	316	252	1	1
No	80	488	5.606(2.0529-12.427)	3.194(1.080-9.447)*
Listening Radio				
Yes	316	252	1	1
No	79	489	6.57(4.11-10.52)	2.31(1.176-4.57)*
Antenatal Care Visit				
No visit	32	536	39.24(21.96-70.11)	4.78(2.19-10.42)***
1 to 2 visit	99	469	11.24(6.372-19.82)	2.45(1.13-5.30)*
3 & + visit	265	303		1
Place of delivery				
Home	28	540	36.37(21.65-61.11)	8.54(4.42-16.50)***
Health Facility	368	200	1	1
Birth attendant By				
Traditional birth	27	541	36.65(21.07-61.77)	
Health professionals	369	199	1	1
Postnatal Care				
No Visit	27	541	38.95(22.32-67.97)	3.65(1.72-7.74)**
1 visit	63	505	12.83(6.66-24.72)	2.68(1.10-6.49)*
2 & + visit	306	262	1	1

Key: *P<0.05, **P<0.01, ***P<0.001, Method = Backward Stepwise (Likelihood Ratio),

1=Reference, COR=crude odds ratio, AOR=Adjusted odds ratio, CI=Confidence interval

Discussion:

The results of this study reveal that, level of maternal knowledge on complementary feeding in the study area is (79.5%). This finding is lower as compared with a community based cross sectional study done in 2014, Abyi-Adi Town, in Ethiopia which was 87 % (41). This difference could be due to the urban residence of the Abyi-Adi Town access to information. Another possible explanation for the difference is that current study respondents' illiterate rate were (58.8%) which is higher than study conducted in Abyi-Adi Town (27.6%). Similarly study conducted in Pakistan showed that mothers who had a good knowledge regarding complementary feeding were (84%) (42) as compare with current study findings which reveals lower knowledge (79.5%). The difference might be because of difference in health service infrastructure set-up and health professional sufficiency. Recent study also shows lower knowledge as compare with study done in shashamene which showed (81.1%) (43) and report from Kosova (88.4%) (44). This variation might be due to difference in socioeconomic and cultural difference. However, current study findings is higher than a studies done in Fitch Town central Ethiopia (61.5%) (45), Bahir Dar City (28.7%) (46), Horo Guduru wollega, western Ethiopia 40%(30) and Bibir Town, Southern Ethiopia 68.3% (47). The differences might be because of the health infrastructure, ecological set-up and service deliveries, and also the current findings reveal higher knowledge than study conducted in Ahmedabad Town, India (29.33%) (48), Enugu state, Nigeria 68.7%(49), Logas state, Nigeria 14.9%(50). This difference may be due to socioeconomic and some cultural factors. This study reveals that, mothers who attended to primary, secondary and above education level are 3.35 time and 3.1 times more likely knowledgeable than those mothers who had no education respectively. It was similar with findings from Logas state, Nigeria, Horo Guduru Wollega, Bangladesh, Harar, Abyi-Adi town, Pakistan, Fitch town and Slum of Bahir Dar city (14,30,31,32,41,42,45,46). This might be because of educated mothers would have more knowledge about complementary feeding, better understanding of information they gate from health workers and health extension workers. Furthermore, education might enhance the status of mother and enable them to develop greater confidence and capacity to make decisions about their child feeding. At the same time, educated mother may be influenced by media advertising of complementary feeding.

Current study reveals that mothers who have one to two, three and above antenatal care follow up are 2.5 and 4.8 times more likely knowledge on complementary feeding than those mothers who have no antenatal care follow up. The current finding is also similar with studies conducted in Nepal, India, Fitch town, Slum of Bahir Dar city and Sodo Town, Southern Nation and Nationality Ethiopia (32,35,45,46,51) respectively, where mothers who attend antenatal follow-up were more likely to have good knowledge than those who were no attending. This might be due an information and counseling that the mothers received from health workers and Health extension workers during their antenatal care visits were consistency. Further, results of present study reveals, mothers who have gave birth at health facilities are 8.5 times more likely to have good knowledge than mothers those who did not gave birth at health facilities. This result is consistent with study conducted in Harar, Sodo town and Mekelle town (33,51,52). This might be due to information given by health workers about complementary feeding helps to boost more maternal awareness. This study revealed that, mothers who have one, two and above, postinatal care visit are 2.6 and 3.6 times more likely to have good knowledge than those mothers who have no

post-natal follow up respectively. This result is similar to studies conducted in Harar, Benishangul Gumuz and Soro district(33,34,37) respectively where mothers who had one, two and above postnatal visit were more likely to have good knowledge than those mothers who had not postnatal care. This might be due to an information and counseling that the mothers received from health workers and Health extension workers during their PNC follow up. This study depicted that, mothers who used to watch TV are 3.2 times more likely to have good knowledge than those mothers who did not watching TV. This result is consistent with study from Nepal, India and Slum of Bahir Dar city(32,35,46),respectively where mothers who were watching TV have good knowledge than those mothers who did not watching TV and also mothers who listening to radio were 2.3 times more likely to have good knowledge than those who did not listening to radio. This is similar with study done in India and Slum of Bahir Dar city(35,46) where mothers who were listening to radio have good knowledge than those mothers who did not listening to radio. This might be due to information gathered from radio and TV increase maternal awareness.

Conclusions:

Educating the mothers through mass media and house to house by health extension workers is recommended to enhance knowledge of complementary feeding.

Abbreviations

CF: Complementary Feeding; DD: Dietary Diversity; IYCF: Infant and Young Child Feeding; HWS: Health Workers; IRB: International Review Board; PI: Principal Investigator; PNC: Postnatal Care; UNICEF: United Nation Children Fund; WHO: World Health Organization

Declarations

Ethics approval and consent to participate:

Ethical approval was obtained from Adama Hospital Medical Collage intuitional review board (IRB). Zonal health department was write supportive letter to the District, permission was obtained from Yaya Gulele District and informed permission was obtained from each study subject prior to the interview after the necessary explanation about the purpose, benefits and risks of the study and also their right on decision of participating in the study. The assurance of confidentiality was performed by omitting name of the study participants from the questionnaire and also the analysis was not for individual it is for groups.

Consent for publication: As there are no identifiable details on individual participants reported in the manuscript, consent to publish is not required.

Availability of data and materials: The datasets examined during the current study are available from the both authors corresponding and second authors on sensible inquiry.

Competing interests: As the authors we did not have any competing interest.

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Authors' contributions: We are proposed and ran study design, data collection, performed data analysis and recruited the manuscript. Third persons had been analytically revised and finalized entire document with imperative contributions. Finally, we both authors have read and approved the final version of the manuscript.

Authors' information: Dr Godana Arero (MPH in General Public Health, PhD in Nutritional Science) and working at Adama Hospital Medical College as Assistant Professor of Nutrition, researcher, consultant and Head Public Health Department. Mr. Mesay Zewdie (BSC in Public Health) working at North Shoa Zone, Yaya Gulele District Health Office, Oromia, Ethiopia.

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Figures

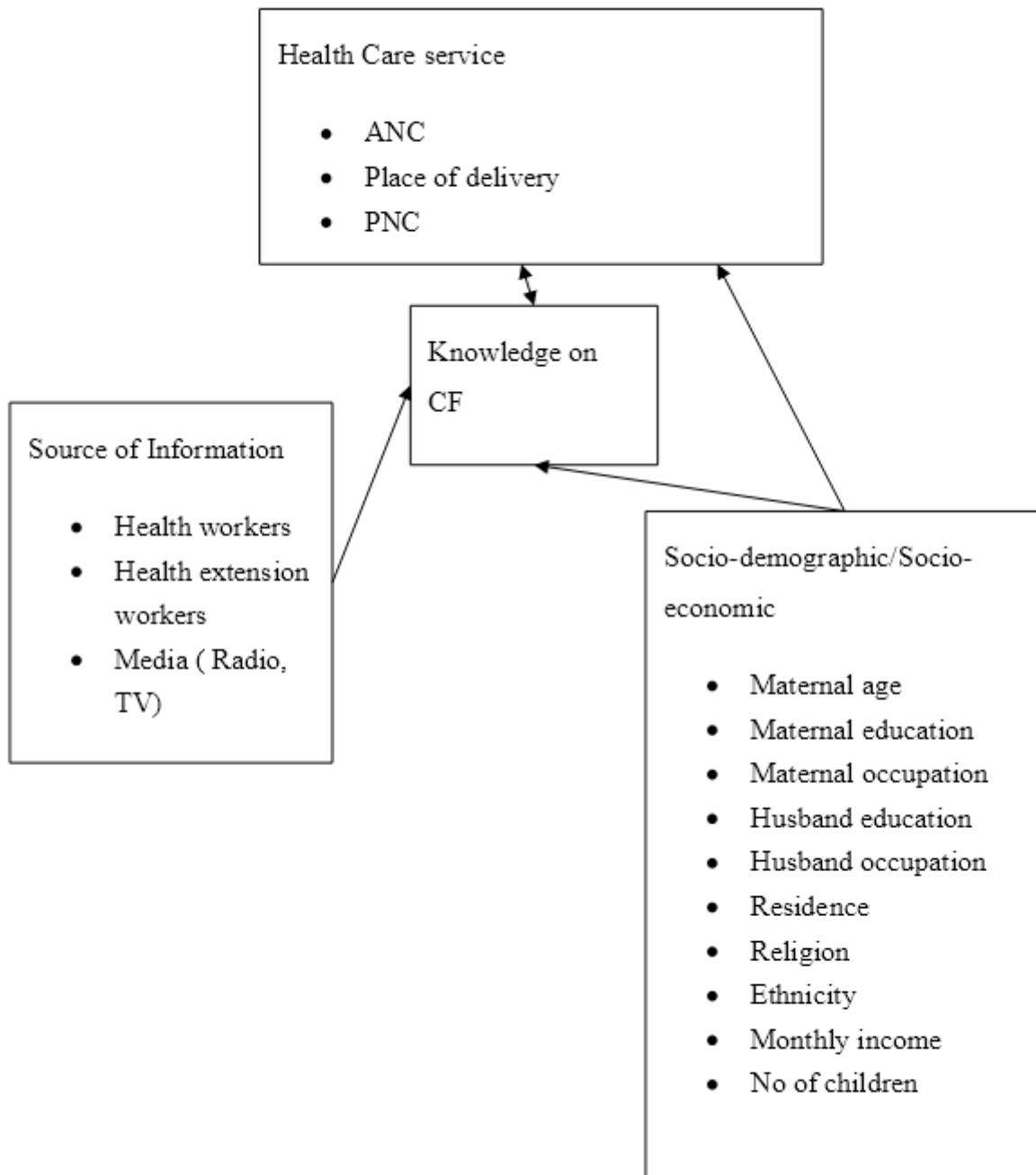


Figure 1

Conceptual Framework for maternal knowledge on CF. Developed by investigator, 2019

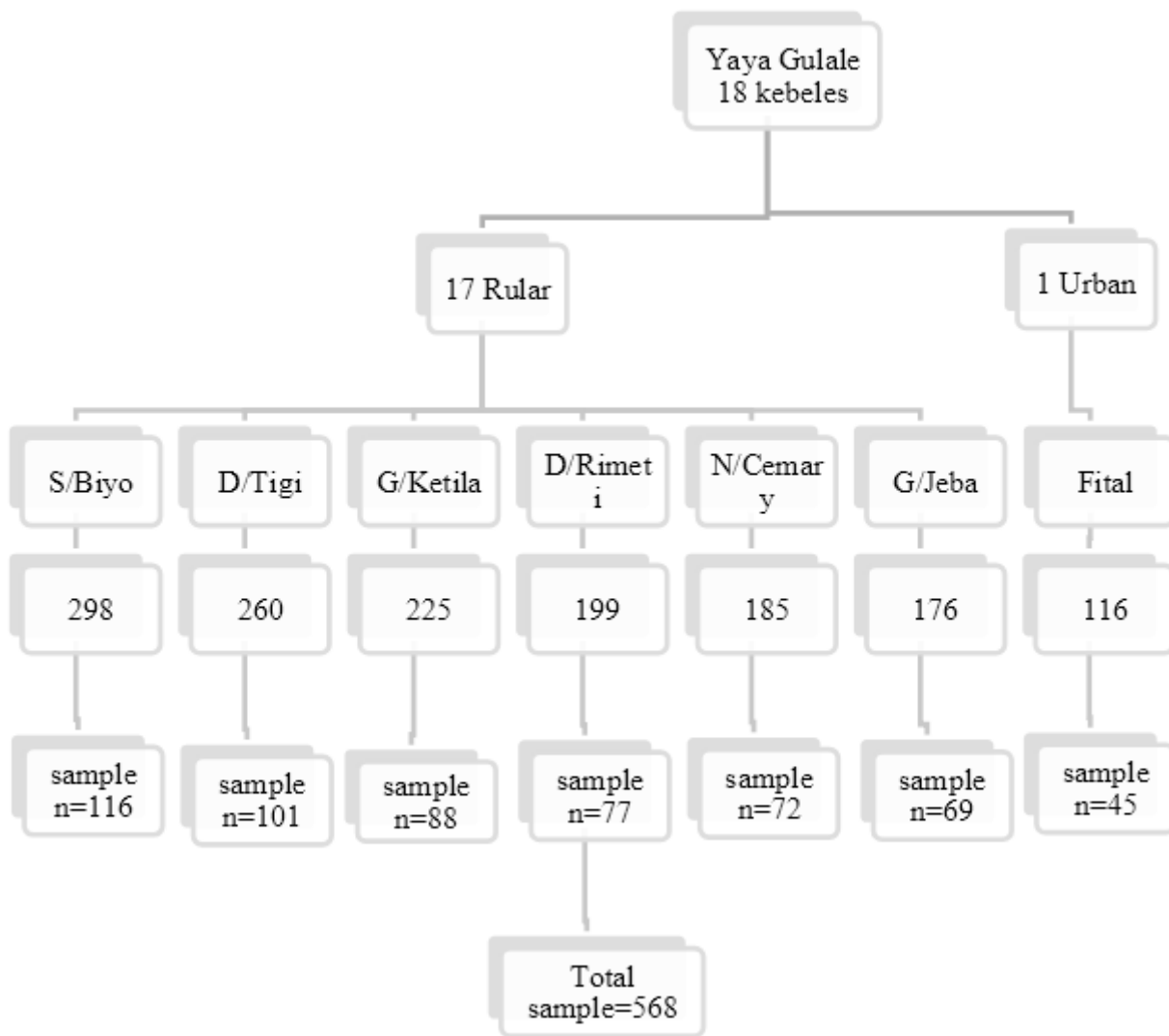


Figure 2

Schematic presentation of sampling procedure, maternal knowledge on complementary feeding and associated Factors in Yaya Gulale district, Oromia, Ethiopia, 2019

Supplementary Files

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