Households' Willingness To Pay And Associated Factors For The Nutrition Services Provided To Pregnant Women At Maternity Waiting Homes In East Wollega, Western Ethiopia

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Research

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Abstract

Background: Maternity waiting home is a housing facility located near qualified medical facilities where a pregnant woman can wait to give birth and provided a nutrition service. In Ethiopia, most (86%) of the maternity waiting homes had no budget allocated from government funds and thus have to rely on communities' contribution. Yet, very few studies have been conducted so far to evaluate the household's willingness to pay for the nutrition service.

Objective: The study aimed to estimate households' maximum willingness to pay and its associated factors for the nutrition service provided to a pregnant woman at a maternity waiting homes in East Wollega Zone of Oromia National regional state, Ethiopia, September 2018.

Methodology: A community based cross sectional study using double bounded dichotomous choice contingent valuation method was used. Sample size was determined by using single population proportion formula. Data entry and analysis were made using Epi-Data version 3.1 and SPSS for Windows version 20 software respectively. Descriptive statistics of frequency, binary and multivariable logistic regression analysis were performed. The associations between explanatory variables and outcome variable were presented by an Adjusted Odd Ratio and confidence interval.

Results: We gathered data from 845 participants (98% response rate). The annual median maximum willingness to pay was 15ETB (US\$0.55) per household. Marital status (AOR=3.533, 95% CI=1.007-12.39) and average monthly income (AOR=3.287, 95%CI=1.194-9.049). Moreover, distance from the health facility (AOR = 3.64, 95%CI = 1.256-10.55) and availability of food (AOR=3.714, 95%CI=1.331-10.364), enough beddings (AOR=5.353, 95%CI=2.207-13.010) and cooking utensils (AOR=4.044, 95%CI=1.353-12.088) at a housing facility were found to be predictors.

Conclusion and Recommendation: Marital status, monthly income, and distance, availability of food, beddings and cooking utensils at housing facilities were found to be factors influencing maximum willingness to pay. Therefore, health facility managers should avail supplies and equipment at a housing facility.

Introduction

Pregnancy is a crucial time to promote healthy behaviors. Inadequate care during this time breaks a critical link in the continuum of care, and affects both women and babies. Good care during this time is important for the health of the mother and the development of the unborn baby. Antenatal care (ANC) and postnatal care (PNC) is a key strategy to improve maternal and infant health(1–3).

The chances of women dying as a result of complications during pregnancy, delivery or the postpartum period remain high in many parts of the world. Lack of access to obstetric services is one of the main causes of the high incidence of maternal and newborn deaths. In many rural, and poor districts of sub-Saharan Africa; maternal mortality is high and utilization of maternal health services is low. A study done

in some parts of Ethiopia showed that maternal mortality and home delivery is still high. Long distances, poor transport facilities and inadequate distribution of health care facilities are responsible for low utilization of health care services in many rural districts in low-income countries (3–5).

Access to comprehensive emergency obstetric care is limited in Ethiopia. Maternity waiting homes are part of the strategies utilized to improve access the hard to reach rural populations. In Ethiopia, the practice of nutrition services provision at maternity waiting home has not been adequately assessed so far. It can be one approach to improve access to comprehensive emergency obstetric care for rural mothers in Ethiopia who are challenged by distance to access services(5–7).

Maternity waiting homes (shelters) are residential facilities located near qualified medical facilities where pregnant woman can wait to give birth. The shelters could play a key role in helping ensure access to comprehensive maternity care, provided communities are willing to help sustain them. The aim of the MWH (Maternal waiting home) is to improve accessibility and thus reduce morbidity and mortality for mother and neonate should complications arise(4, 7).

Active community involvement and quality care within the health care facility are key to the use and sustainability of a MWH. To improve sustainability of these communities owned and managed shelters; Contributions, either in the form of individual donations or an annual community contribution, have potential to support the long-term financial sustainability of the shelters. To be successful, maternity waiting homes should have community involvement and support(8–10).

Financing health care is a sensitive issue that is currently being discussed around the world. The quality of health services provided and increasing in the health care cost is the main concerns related to this. In many developing countries; people are expected to contribute to the cost of health care from their own resources. But, the amount that an individual is willingness to pay may or may not be adequate for the sustainability of a given healthcare and have many influencing factors (11). In developing countries lack of adequate health care budgets is a severe problem. Traditional ways such as raising health care tariffs is not an adequate response to the increasing costs of health care. Lower income groups such as rural residents, unlike medium and higher income groups, may reduce the amount they are willing to pay and are more sensitive to price changes in health care services (7)

Thus advanced ways to raise funds for the provision of health services are often sought. However, a rural households' willingness to pay for health care services and if so, how much and what factors determine their willingness to pay for the sustainability of the health care services are still not well known. The need for, and willingness to pay (WTP) for, health care services varies between areas. Average households' willingness to pay may match or exceed the cost of their health care(8).

In Ethiopia, many MWHs were built with the support of the community, which usually contribute money for the services provided to mothers staying at these waiting homes. Funding is required to lower other barriers to utilization, such as food provision. Most (86%) of the MWHs had no budget allocated from

government funds and there is a shortage of revenue for the long term sustainability of the MWH services (11–13).

Households' contribution is mandatory to improve sustainability of this community- owned and managed shelters; but it is unknown how much they might be willing to contribute and what factors determines their willingness to pay for the services to use community-managed shelters. Determining the recurrent cost for a renovating the shelter to provide food and to assess this cost in relation to willingness to pay is important. There are also women who give birth at home because of lack of affordability for the suggested donation at the maternity waiting home service (4, 6, 9, 11).

In addition studies conducted in different parts of Ethiopia showed that there is a shortage of food availability, kitchen utensils and fuel as well as lack of basic social and healthcare services such as; inadequate beddings, water and sanitary services, lack of visits to mothers staying at a MWH were the factors deterring the use of MWHs were some of the barriers to access and utilization of a MWH (6, 12, 13).

Currently, majority of the maternity waiting homes are located in rural health centers serving about 8–12 pregnant woman at a time and annually each household is expected to voluntarily contribute money to the nutrition service provided to pregnant mothers staying at maternity waiting home. Pregnant woman will come and stay at a MWH one-two weeks before the current amount of price proposed by the government to be paid annually was 10 ETB per household. This is because there is a difference in the amount of money contributed from area to area or region to region. Though the amount of price to be paid was proposed by the government, it was being paid by the households annually. But there were no a settled tariff for how much should households has to contribute in an average for the service as a result; the level of household participation and the revenue generated so far is unsatisfactory. There were a very few study conducted on the households' willingness to pay for this service and factors affecting the households' WTP for the services were not identified.

This study is, therefore, meant to identify critical factors that determine household's MWTP (maximum willingness to pay) for the nutrition service provided to a pregnant woman at a MWH and estimate the maximum amount of households' WTP per year for the nutrition services provided to the pregnant women staying at a MWH. In addition, it is aimed to identify the households' attitude and support towards the nutrition service provided to pregnant women at MWHs.

Methods And Materials

Study area and period

This study was conducted from August 13-September 02/2018 in the East Wollega zone of Oromia Regional State, Ethiopia. Ethiopia is a federation subdivided into ethno-linguistically based on regional states and chartered cities. Regions are each governed by a regional council whose members are directly elected to represent woreda while zones are a second level of subdivision of Ethiopia below regions and

above woredas or districts. Districts or woredas are the third-level administrative divisions of Ethiopia and they are further subdivided into a number of kebeles which are the smallest unit of local government in Ethiopia. There are about 12 regions and more than 68 zones in Ethiopia. The East Wollega Zone is one of the zones in Oromia region and its Town is Nekemte. It is located 333 km from Addis Ababa and has 17 woredas and has a total population of 1,535,415. The zone has 225,599 total numbers of households and it has a total of 59 health centers, 189 primary clinics, and 05 medium clinics. The zone has seventeen (17) rural and forty seven (47) urban drug stores. In Ethiopia, majority of the maternity waiting homes are being built at woreda level and in primary health facilities under the woredas. In the zone eleven woredas have maternity waiting homes, but all the households in the zone pay for the nutrition services provided to the pregnant mothers. The zone has a total of three hundred fifteen (315) kebeles and there are one hundred sixty two (162) kebeles in the nine (9) randomly selected woredas (14).

Study design and source population

Community based cross sectional study design was employed. The study population was all households in Eastern Wollega Zone but household heads that lived in that area for at least one year were included in the study. In addition, a household heads those who have under-five children and whose mothers who have previously history of giving birth at health facility were interviewed. Household heads that was seriously and mentally ill was excluded from the study because it is the responsibility of heads' of the households to pay for the services annually and possibly respond for the questions.

Sample size and Sampling procedures

The sample size was determined by using single population proportion formula. Since no study was conducted on the issue in the study area, the sample size was calculated by assuming the half of the households are willing to pay for the nutrition service provided to a pregnant women ($P = 50\%$) and 95% confidence interval ($Z = 1.96$) with a margin of error ($d = 0.05$) (15).

Therefore, by inserting the values in the following formula: $n = (Z_{\alpha/2})^2 p (1-p) / d^2$; where: $Z_{\alpha/2}$ is a standard score value for 95% confidence level for two sides normal distribution, $P = (50\%)$ whereas d = is margin of error which is equal to 5% and n is the maximum possible sample size. Given these assumptions the sample size was estimated to be **384**. By multiplying it with the design effect of two (2) and adding **10%** for potential non-response, the final sample size became **845**.

Following WHO assessment guideline, out of **seventeen** (17) woredas in the East wollega zone **50 % (9)** of the woredas were selected. Similarly out of three hundred fifteen (**315**) kebeles in the zone **10% (32)** of the kebeles were selected. (16) These **nine** (9) woredas and **thirty two** (**32**) kebeles were selected randomly by using a lottery method. The required numbers of kebeles were proportionately allocated to their respective woredas and the required numbers of households were proportionately allocated to their respective kebeles.

The following formula was used to proportionally allocate the number of kebeles to each woredas as well as households to each kebeles: $n_i = nN_i/N$ where; n_i =the sample size of the i^{th} kebele, n = sample size, N_i =population size of the i^{th} kebele and N = the total population of the catchment area. Finally; the households were randomly selected by a lottery method using the family folder (a registration containing the name of members each household) at the health posts as a sampling frame (Table 1).

Table 1: Sampling procedures of the study areas and the study participants in East wollega Zone, Oromia regional state, Ethiopia, September 2018.

Name of randomly selected woredas	B/Boshe	W/Hagal	W/Tuqa	S/Sire	L/Dulach	J/Arjo	G/Gida	G/Sayo	Diga	Total
Proportionally allocated numbers of kebeles	3	3	3	3	4	4	4	4	4	32
Proportionally allocated numbers of households	65	83	82	132	77	149	105	69	83	845

Data collection tools and techniques

To elicit the respondents' maximum willingness to pay both close ended and open ended double bounded dichotomous (DBDC) contingent valuation techniques were used. Data was collected by using face-to-face interviewer administered questionnaire. Four point likert scale questions were designed to elicit the respondent's attitude towards the problem as well as towards the importance of the service. In addition a dichotomous questions to identify their support towards the nutrition services provided to pregnant women staying at a maternity waiting home and willingness to pay questions to elicit the respondents' stated preference for the improvement of the service (17).

The bidding game was offered for the respondents to know their willingness to pay. Hence, the initial bidding price used was the currently paid price (10ETB) that was proposed by the government to be paid by households for the nutrition services provided to a pregnant woman staying at a maternity waiting home annually. Then 2ETB was used to add and subtract from the initial bidding price depending on respondents' response to the initial bidding price (10ETB). As a result, if the respondents were willing to pay more when asked to pay additional price, 2ETB was added on initial bidding price up to two incremental stages (10ETB, 12ETB, 14ETB) then WTP Max was asked. But if the respondents were not willing to pay the initial bidding price, then 2ETB was used to subtract from the initial bidding price for those who were not willing to pay the initial price up to two detrimental stages(10ETB,8ETB,6ETB) then WTP max was asked.

The bidding game was conducted as follows: First, the price currently proposed by the government (10ETB) was used as initial bidding price. For the respondent who accepted the initial bidding price (willing to pay 10ETB), the bid was raised to 12 ETB by adding 2ETB on the initial bidding price. If he or

she again accepted this amount (12ETB), then the bid was raised to 14 ETB by adding 2ETB on 12ETB and then respondents were asked their willingness to pay this amount of price. At this level the respondent was asked about his/her maximum WTP either if he or she accepted or rejected the 14 ETB bid. In a similar way, if the respondent rejected the starting bid 10 ETB, the bid was lowered to 8 ETB by reducing 2ETB from the initial bidding price. A respondent who accepted this bid was asked about her or his WTP max. But for a respondent, who rejected 8ETB, the bid was lowered to 6 ETB and then the respondent was asked about his or her maximum WTP (Fig: 1).

Study variables

Dependent variable: Amount of willingness to pay

Independent Variables include

- **Socio demographic factors such as:** - Age, Marital status, Sex, Educational status, Occupation, Distance from the health facility, and Family size.
- **Socio economic factors such as:**-Income, Affordability and Decision on money spending.
- **Basic social and healthcare services factors such as:-** service quality provided to a pregnant woman staying at a MWH, Satisfaction gained from the nutrition services provided at a MWH, Privacy at a MWH, Availability of sanitary services, Availability of food, Availability of (water, beddings, cooking facilities, power or electricity), and Lack of visits to mothers at MWH.
- **Influences of other individuals such as;** Effect of peers, cooperation b/n Healthcare providers and pregnant women, and Perception about who should pay for the service

Data were entered using Epi-Data version 3.1 and analyzed using SPSS for windows version 20 software. Frequency distribution of dependent and independent variables were performed. Bivariate analysis was carried out to determine associations of selected variables with dependent variable and p-value of less than or equal to 0.25 was taken as a cutoff point to consider a variable as candidate for the final multiple logistic regression. Independent predictors were determined using adjusted odds ratio with 95% confidence interval in a multiple regression analysis.

Data quality assurance

Due care was made to assure the quality of the data. Training was given for data collectors and supervisors on data collection tools. The tools were translated to local language (Afan Oromo) and were pre-tested. The completeness of the questionnaire at the end of the day was checked by supervisors on field and rechecked by the principal investigator.

Ethical Approval was taken from JU Health Institute, Faculty of Public Health. Responses of respondents' were anonymous and data collectors were informed respondents that they have full right to discontinue or refuse to participate in the study if they were not willing to participate.

Results

Socio demographic characteristics of the respondents

A total of **845** households in the East wollega zone were included in the study of which **830** responded, making the response rate **(98%)**. More than half of the respondents (54.7%) were young female household heads with the mean of the age of 30.58 years ($SD \pm 8.6$). Christianity is the dominant religion in the area (54.5% of the respondents were Protestants, and 33.2% were Orthodox). Furthermore, about 92.7% of them were ethnic Oromos and the remaining (7.3%) were Amharas.

Majority of the participants 83.7% were married and the average households' family size was 5.07($SD \pm 1.95$). This is higher than the national average household size (4.6) and even higher than national rural household size (4.9). Like many rural household heads, majority (38.6%) of the respondents were unable to read and write and the other 37.83% of them has elementary (1–8) school education More than half of the respondents(58.1%) were farmers whereas only 9.64% were government employees. The median monthly income of the respondents was 600 ETB and the mean distance of the health facility from the households was 4.6($SD \pm 2.58$) (Table 2).

Table 2
Socio-demographic characteristic of the respondents in East Wollega Zone, Oromia regional state,
Ethiopia, 2018

Variables	WTP for the nutrition service		Total
	WTP < 10 ETB	WTP > = 10ETB	
Sex			
Male	17(36.2)	359(45.8)	376
Female	30(63.8)	424(54.2)	454
Age			
18–24 years	19(40.4)	159 (20.3)	178
25–34 years	15(31.9)	392 (50.1)	407
35–44 years	4(8.5)	190(24.3)	194
45 years and above	9(19.1)	42 (5.4)	51
Marital status			
Married	34(72.3)	661(84.4)	695
Single	13(27.7)	122(15.6)	135
Ethnicity			
Oromo	43(91.5)	726(92.7)	769
Amhara	4(8.5)	57(7.3)	61
Religion			
Orthodox	17(36.2)	253(32.3)	270
Muslim	9(19.1)	99(12.6)	108
Protestant	21(44.7)	431(55)	452
Educational status			
Illiterate	30(63.8)	290(37)	320
Can read and write	7(14.9)	70(8.9)	77
Elementary (1–8)	9(19.1)	305(39)	314
Secondary(9–12)	0(0)	78(10)	78
College and above	1(2.1)	40(5.1)	41

Note: The classification of the above variables in to different category was adapted from similar studies conducted in the countries(10)

Variables	WTP for the nutrition service		Total
	WTP < 10 ETB	WTP > = 10ETB	
Occupational status			
Farmer	23(48.9)	459(58.6)	482
Student	0(0)	9(1.1)	9
House wife	15(31.9)	116(14.8)	131
Government Employer	2(4.3)	78(10)	80
Merchant	0(0)	79(10.1)	79
Daily laborer	7(14.9)	42(5.4)	49
Average monthly income			
Less than 200 ETB	7(14.9)	92(11.7)	99
200–400 ETB	13(27.7)	149(19)	162
401–692 ETB	18(38.3)	191(24.4)	209
Greater than 692 ETB	9(19.1)	351(44.8)	360
Distance of the HHs from the health facility			
Less than 5KM	40(85.1)	553(70.6)	593
Greater or equal to 5km	7(14.9)	230(29.4)	237
Note: The classification of the above variables in to different category was adapted from similar studies conducted in the countries(10)			

Households' WTP for the nutrition service at MWH

Among 830 respondents, 783 (94.3%) were willing to pay greater or equal to 10 ETB whereas only 47 (5.7%) were willing to pay less than 10 ETB with a minimum of 5ETB and maximum of 8ETB for the nutrition service provided to a pregnant women at MWH.

The average maximum amount of respondents' willingness to pay for the nutrition provided to a pregnant women staying at MWH was found to be **15 ETB (0.55 USD)** per year per household. This is 50% higher than the prevailing price set by the government. The minimum WTP for the service was 5ETB and maximum was 500 ETB. The proportion of respondents who were willing to pay below the median maximum amount (15ETB) was about 45.2%, whereas about the proportion of respondents who were willing to pay above the median maximum amount were 43.1%. About 5.7% of the respondents were willing to pay below 10 ETB while 51.2 % of the respondents were willing to pay between 10 ETB and 15 ETB. (Table 3 and Fig. 2)

The Fig. 2 shows that the large majority of the household heads are willing to pay more than the prevailing price (10br). Only six percent of them were willing to pay less than 10Br. This may be due to the fact that female headed households constitute significant proportion of the respondents. Table 3 summarizes the respondents' maximum willingness to pay for the nutrition service provided to a pregnant woman at MWH per year per household.

Table 3
Summary of annual maximum willingness to pay for the nutrition service
provided to a pregnant women at MWH

Variables	Maximum WTP for the nutrition service		
	Minim (ETB)	Maximum(ETB)	Median (ETB)
Less than 10 ETB	5	8	8
Between 10 and 15 ETB	10	15	10
Above 15 ETB	16	500	20

Determinants of Households willingness to pay for the nutrition service

Logistic regression analysis was used to identify the major explanatory variables of households' the maximum willingness to pay for the nutrition service provided to a pregnant women staying at a MWH. It was revealed that age of the respondent was one major determinant as younger households are more likely to be willing to pay for the nutrition service provided to a pregnant woman at a MWH. For instance, it was noted that the MWTP of a group of respondents who had a mean age of 52.78 years ($SD \pm 8.09$) were nearly 94% lower than the MWTP of a group who had a mean age 28.42 years ($SD \pm 2.56$). On the other hand, respondents who were ever married had higher willingness to pay ($AOR = 3.533$, $95\%CI = 1.007-12.39$) than unmarried counterparts.

Surprisingly, respondents collage and above educated respondents had lower willingness to pay for the nutrition service ($AOR = 0.346$, $95\%CI = 0.14-0.857$) compared to illiterate counterparts. Respondents who were house wife ($AOR = 2.625$, $95\%CI = 1.075-6.413$) and daily laborers ($AOR = 3.593$, $95\%CI = 1.068-12.089$) had higher willingness to pay than farmers. Respondents who had a median monthly income of 1000ETB ($AOR = 3.287$, $95\%CI = 1.194-9.049$) were more likely to have higher WTP for the service as compared respondents who had a median monthly income of 100 ETB.

Respondents who were closer to the health facility (at less than 5km) ($AOR = 3.64$, $95\%CI = 1.256-10.55$) had higher willingness to pay for the nutrition service than those who were living at distant (at greater than 5km) from the health facility. Furthermore, WTP was positively influenced by respondents perception/believe in the availability of quality food ($AOR = 3.714$, $95\%CI = 1.331-10.364$), beddings ($AOR = 5.353$, $95\%CI = 2.207-13.010$) and cooking facilities ($AOR = 4.044$, $95\%CI = 1.353-12.088$) at a MWH.

Respondents had a higher willingness to pay if someone else was paying (AOR = 2.691, 95%CI = 1.204–6.011) and respondents had a higher willingness to pay if they believed that it was not the government's responsibility to pay for the nutrition services provided to a pregnant woman at a maternity waiting home (AOR = 3.643, 95%CI = 1.669–7.948) than others.

Adequacy and fitness of model were checked (*with Naskerkele R square of 45% and Hosmer Lemeshow of p -value > 0.06*). (Table 4)

Table 4
Predictors of WTP for the nutrition provided to a pregnant women at a MWH in East Wollega Zone, Oromia regional state, Ethiopia, September 2018.

Variables	WTP for the nutrition service		OR and 95% CI	
	< 10ETB	>=10ETB	COR(95%CI)	AOR(95%CI)
	n = 47(%)	n = 783(%)		
Age				
18–24 years	19(40.4)	159(20.3)	1	
25–34 years	15(31.9)	392(50.1)	0.558(0.235–1.322)	0.368(0.115–1.74)
35–44 years	4(8.5)	190(24.3)	0.179(0.074–0.433)	0.09 (0.027–0.3)***
45 years and above	9(19.1)	42 (5.4)	0.098(0.029–0.334)	0.06 (0.013–0.25)***
Marital status				
Never married	13(27.7)	122(15.6)	1	
Ever married	34(72.3)	661(84.4)	2.072(1.036–4.039)	3.53 (1.007–12.39)*
Educational status				
Illiterate	30(63.8)	290(37)	1	
Can read and write	7(14.9)	70(8.9)	0.273(0.185–0.623)	0.510(0.167–1.554)
Elementary (1–8)	9(19.1)	305(39)	0.285(0.133–0.611)	0.108(0.004–2.945)
Secondary(9–12)	0(0)	78(10)	0.351(0.132–0.597)	0.284(0.175–1.05)
College and above	1(2.1)	40(5.1)	0.242(0.032–1.82)	0.346 (0.140–0.86)*
Occupational status				
Farmer	23(48.9)	459(58.6)	1	
House wife	15(31.9)	116(14.8)	2.581(1.305–5.102)	2.63(1.08–6.4)*

p*-value < 0.05, **p*-value < 0.001, 1 = reference

Variables		WTP for the nutrition service		OR and 95% CI	
		< 10ETB	>=10ETB	COR(95%CI)	AOR(95%CI)
		n = 47(%)	n = 783(%)		
Daily laborer		7(14.9)	42(5.4)	3.33(1.35–8.21)	3.59 (1.1–12.1)*
Average monthly income					
Less than 200 ETB		7(14.9)	92(11.7)	1	
200–400 ETB		13(27.7)	149(19)	2.967(1.076–8.18)	1.307(0.34–5.020)
401–692 ETB		18(38.3)	191(24.4)	3.403(1.424–8.132)	2.55(0.828–7.863)
Greater than 692 ETB		9(19.1)	351(44.8)	3.675(1.62–8.339)	3.29 (1.194–9.049)*
Distance of the HH from the health facility					
Less than 5KM		40(85.1)	553(70.6)	2.377(1.049–5.383)	3.6 (1.256–10.557)*
Greater or equal to 5 KM		7(14.9)	230(29.4)	1.00	
Availability of food at a MWH	Yes	40(85.1)	533(68.1)	2.68(1.184–6.067)	3.7 (1.331–10.364)*
	No	7(14.9)	250(31.9)	1.00	
Availability of water at a MWH	Yes	41(87.2)	570(72.8)	2.554(1.069–6.101)	1.79(0.551–5.820)
	No	6(12.8)	213(27.2)	1.00	
Availability of beddings at a MWH	Yes	34(72.3)	415(53)	2.319(1.205–4.62)	5.35 (2.21-13)***
	No	13(27.7)	368(47)	1.00	
Availability of cooking facilities at a MWH	Yes	31(66)	433(55.3)	1.566(0.843–2.91)	4.04 (1.4–12.1)*
	No	16(34)	350(44.7)	1	
Effect of peers	Yes	14(29.8)	421(53.8)	1.00	
	No	33(70.2)	362(46.2)	2.741(1.444–5.203)	2.7 (1.204–6.011)*

p*-value < 0.05, **p*-value < 0.001, 1 = reference

Variables		WTP for the nutrition service		OR and 95% CI	
		< 10ETB	>=10ETB	COR(95%CI)	AOR(95%CI)
		n = 47(%)	n = 783(%)		
Affordability	Yes	29(61.7)	287(36.7)	2.784(1.519–5.103)	3.61(0.748–17.382)
	No	18(38.3)	496(63.3)	1.00	
Service quality	Yes	45(95.7)	694(88.6)	2.885(0.688–12.1)	1.1 (0.19–6.112)
	No	2(4.3)	89(11.4)	1.00	
Perceiving as it is the government's responsibility	Yes	17(36.2)	464(59.3)	1.00	
	No	30(83)	319(40.7)	2.567(1.392–4.733)	3.6 (1.7–7.95) ^{***}
Availability of electric power at the MWH	Yes	45(95.7)	667(85.2)	3.913(0.936–16.35)	3.61(0.748–17.382)
	No	2(4.3)	116(14.8)	1.00	
Availability of kitchen at a MWH	Yes	41(87.2)	563(71.9)	2.67(1.118–6.378)	1.25(0.406–3.822)
	No	6(12.8)	220(28.1)	1.00	
Availability of adequate firewood at a MWH	Yes	39(83)	516(65.9)	2.523(1.162–5.475)	2.52(0.933–6.78)
	No	8(17)	267(34.1)	1.00	
<i>*p-value < 0.05, ***p-value < 0.001, 1 = reference</i>					

Discussion

The maximum willingness to pay of households for the nutrition service provided to pregnant women at a MWH was measured using double bounded dichotomous contingent valuation method. The estimated (median) maximum WTP per household was found to be **15 ETB** (~ US\$ **0.55**) per year with a minimum of 5 ETB and maximum of 500 ETB. The figure is higher than the price that the government wants to be paid by the households. On the other hand, the nutrition service program that provided nutrition services to pregnant women at a MWH suffers from shortage of revenue. This study shows that households are willing to pay for the nutrition services, and there is a room for the government to increase the fee charged.

Older household heads were found to have higher willingness to pay for the service than their younger counterparts. This finding is similar with the study conducted in other areas of the countries (6, 19). One possible explanation is that since older female household heads are more likely to give more birth than younger ones and as most of them are living in rural areas, they might have experienced the nutrition service delivery at health facilities which are mostly located in towns. Similarly, in line with the findings of study conducted in other countries (6, 21), it is also found that respondents who were ever married were about **3.5** times more likely to be willing to pay for service than those who were never married. This could also be explained by the maternity experience of married women; i.e., married women are more likely to have previous utilization of nutrition service at MWH and see its benefit than those who were never married.

It is also noted that respondents who were college graduates and above have 65.4% less maximum willingness to pay than respondents who were illiterate. This finding is in line with the study conducted in other parts of Africa and Ethiopia (20). The possible reason might be due to high risk perception among less educated respondents on maternity care services. The perception of educated people on the quality of such services provided to the mass might also influence their willingness to pay.

Income of the respondent was found to be important determinant of WTP for the nutrition service at MWH. Comparison is made between two groups of respondents with median monthly income of 100 ETB and 1000 ETB. It was found that those with median monthly income of 1000 ETB were almost **three** times more likely to be willing to pay above the currently paid price compared to those who had median monthly income of 100ETB. This is in line with economic theory in that the higher the income; the more people are willing to pay for normal goods. It is also consistent with empirical from china and some other parts of Africa(20). Respondents who were closer (at less than 5km) to health facility were **3.6** times more likely to have WTP above the currently paid price than who were far (at greater than 5km) from the health facility. This may imply that those households who are distant from the health facilities seem to have less awareness on the importance of the service. The finding is in line with the study conducted at other parts African countries including Ethiopia (22, 23).

Respondents' perception about the quality of nutrition service (such as food, bed, and cooking facilities) at MWH is also affects the WTP of the households. This study shows that those households who believe that the there is enough food, bed, and cooking facilities at the MWH are more likely to be willing to pay above the currently paid price than others. This is also consistent with the finding of the study conducted in some parts of Africa (24).

Awareness on the ownership of the service/ program is found to have significant impact on WTP for nutrition service at MWH as respondents who believed that providing nutrition service to pregnant at MWH is government's responsibility were more likely to have WTP above the currently paid price than who had higher perceived government's responsibility counterparts (AOR = 3.6, 95%CI = 1.7–7.95). This is consistent with the study conducted on WTP and WTJ for newly proposed SHI in Ethiopia(15). The

possible explanation might be due to the respondents' higher perception towards the maternal care service as it was totally an exempted service.

Limitation of the study

This study is based on the respondents' stated preferences to the services which does not mean the households are committed

Conclusion

The study revealed the possibility of enhancing the revenue needed for the sustainability of nutrition service given to pregnant women at MWH as the average MWTP for the service is higher than the currently applied membership fee. Most households are willing to pay for the service though their MWTP varies. Demographic, socioeconomic, and institution specific factors affect households MWTP. Perception toward the quality of the service also affects the WTP for the service. .

Recommendations

It is evident from the discussion that there is a possibility of raising the membership fee. Thus, Federal ministry of health and policy makers should consider revising the fee so as to sustain the service provision and promote as well strengthen its functioning at all level of the health facility. Health facilities governing bodies should ensure availability of food items, cooking utensils and enough beds at a MWH as these affects households WTP. Furthermore, health extension workers and, community leaders, should mobilize communities in order to strengthen the communities' ownership by engaging in awareness creation activities.

Abbreviations

AOR: Adjusted Odd Ratio, DBDC: Double Bounded Dichotomous, CVM: Contingent Valuation Method, ETB: Ethiopian Birr, FMOH: Federal Ministry of Health, HC: Health Center, HDA: Health Development Army, HEW: Health Extension Workers, HF: Health Facility, HH: Household, JU: Jimma University, MNCH: Maternal Neonatal and child health services, MWH: Maternity Waiting Home, NGO: Non-governmental Organization, OR: Odd Ratio, SD: Standard Deviation, SMAGs: Safe Motherhood Action Groups, SPSS: Statistical Package for the Social Sciences, USD: United States Dollar, WHO: World Health Organisation, WTP: Willingness to Pay

Declarations

Ethical approval

The study was approved by Jimma University ethical review board. Permission to collect data was obtained from east Wollega zone health administration office.

Consent for publication

Not applicable for this research

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of interest

The authors declare that they have no conflicts of interest.

Funding

Not applicable

Consent

A free informed consent written or verbal was obtained from each individual participant at the start of the study.

Author's contribution

Adisu Ewunetu participated and conceptualized the study, collected the data, led the analysis, and wrote the text of the paper, Teferi Daba and Gebeyehu Jeldu advised on the conceptualization of the study, analysis of the data, and presentation of the results. They also, reviewed, and edited the manuscript. All authors read and approved the final version of the manuscript.

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Figures

Figure 1

Sequence of willingness to pay questions depending on respondents' response to each price bid

Figure 2

Percentage of respondents willing to pay a certain range for the nutrition service(Exchange rate: US\$1=27.471 ETB, source (18))