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BMC Pregnancy and Childbirth

A facility-based study of women' satisfaction and perceived quality of reproductive and maternal health services in the Kenya output-based approach voucher program --Manuscript Draft--

Manuscript Number:	PRCH-D-16-00525R7	
Full Title:	A facility-based study of women' satisfaction and perceived quality of reproductive and maternal health services in the Kenya output-based approach voucher program	
Article Type:	Research article	
Section/Category:	Pregnancy and childbirth in low and middle income countries	
Funding Information:	Kreditanstalt für Wiederaufbau (KfW) (Development of the Health Sector, Health Financing Support and Output Based Approach, Phase III, BMZ-No. KENYA 2010 65853)	Dr Urbanus Kioko
Abstract:	<p>Background</p> <p>This is a facility-based study designed to assess perceived quality of care and satisfaction of reproductive health services under the output-based approach (OBA) services in Kenya from clients' perspective.</p> <p>Method</p> <p>An exit interview was conducted on 254 clients in public health facilities, non-governmental organizations, faith-based organizations and private facilities in Kitui, Kilifi, Kiambu, and Kisumu counties as well as in the Korogocho and Viwandani slums in Nairobi, Kenya using a 23-item scale questionnaire on quality of reproductive health services. Descriptive analysis, exploratory factor analysis, reliability test, and subgroup analysis using linear regression were performed.</p> <p>Results</p> <p>Clients generally had a positive view on staff conduct and healthcare delivery but were neutral on hospital physical facilities, resources, and access to healthcare services. There was a high overall level of satisfaction among the clients with quick service, good handling of complications, and clean hospital stated as some of the reasons that enhanced satisfaction. The County of residence was shown to impact the perception of quality greatly with other social demographic characteristics showing low impact.</p> <p>Conclusion</p> <p>Majority of the women perceived the quality of OBA services to be high and were happy with the way healthcare providers were handling birth related complications. The conduct and practice of healthcare workers is an important determinant of client's perception of quality of reproductive and maternal health services. Findings can be used by health care managers as a guide to evaluate different areas of healthcare delivery and to improve resources and physical facilities that are crucial in elevating clients' level of satisfaction.</p> <p>Key Words: Quality perception, Satisfaction, Output Based Approach, Vouchers, reproductive health</p>	
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Response to Reviewers:	<p>1. Authors It is noted that authors Nicholas Muraguri and Charles Nzioka, listed in the original manuscript, have been removed in the final draft - please provide an Authorship Change Form and send it by email to the Editorial office to be approved by the Editor. The form can be found here: https://www.biomedcentral.com/getpublished/editorial-policies#authorship.</p> <p>We have done this and sent the signed and approved form via mail</p> <p>2. Consent to Participate Thank you for providing a section in your declarations for Ethics Approval and Consent to Participate in this study. In this section, please state the reason(s) why verbal, rather than written, consent was obtained from participants. Please also state how verbal consent was recorded, and whether the ethics committee that approved this study also approved this mode of consent.</p> <p>We have provided this information on lines 193-198 and repeated the same in line 398-403 under Consent to participate in this study</p> <p>3. Funding Thank you for stating that the funding bodies had no role in the writing or submission of this manuscript. In the funding section, please also state the role of the funding body in the design of the study and collection, analysis, and interpretation of data for this study.</p> <p>We have provided this information on lines 417-419</p> <p>4. Authors' Contributions Thank you for providing a statement on authors' contributions in your Declarations section. Please provide more information for all authors except BO and UK. Contribution to data entry/analysis or revision of the manuscript, alone, does not usually justify authorship. Please ensure that all authors have read and approved the final version of the manuscript, and include a statement to this effect (as currently found in the manuscript).</p> <p>We have provided this information on lines 421-425</p> <p>5. Submission Files Thank you for providing a response letter to the reviewers; as this document is no</p>

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The reasons for the overlap is that some of the work cited evaluated the same OBA program and even some of the authors participated in the work hence we referenced them. However, we have paraphrased the written highlighted sections in lines 79-92, 106-109, and 112-119.

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1 **A facility-based study of women' satisfaction and perceived quality of reproductive and**
2 **maternal health services in the Kenya output-based approach voucher program**

3

4 **Authors**

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27 **ABSTRACT**

28 **Background**

29 This is a facility-based study designed to assess perceived quality of care and satisfaction of
30 reproductive health services under the output-based approach (OBA) services in Kenya from
31 clients' perspective.

32 **Method**

33 An exit interview was conducted on 254 clients in public health facilities, non-governmental
34 organizations, faith-based organizations and private facilities in Kitui, Kilifi, Kiambu, and
35 Kisumu counties as well as in the Korogocho and Viwandani slums in Nairobi, Kenya using a
36 23-item scale questionnaire on quality of reproductive health services. Descriptive analysis,
37 exploratory factor analysis, reliability test, and subgroup analysis using linear regression were
38 performed.

39 **Results**

40 Clients generally had a positive view on staff conduct and healthcare delivery but were neutral
41 on hospital physical facilities, resources, and access to healthcare services. There was a high
42 overall level of satisfaction among the clients with quick service, good handling of
43 complications, and clean hospital stated as some of the reasons that enhanced satisfaction. The
44 County of residence was shown to impact the perception of quality greatly with other social
45 demographic characteristics showing low impact.

46 **Conclusion**

47 Majority of the women perceived the quality of OBA services to be high and were happy with
48 the way healthcare providers were handling birth related complications. The conduct and
49 practice of healthcare workers is an important determinant of client's perception of quality of

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50 reproductive and maternal health services. Findings can be used by health care managers as a
51 guide to evaluate different areas of healthcare delivery and to improve resources and physical
52 facilities that are crucial in elevating clients' level of satisfaction.

53 **Key Words:** Quality perception, Satisfaction, Output Based Approach, Vouchers, reproductive
54 health

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56 **BACKGROUND**

57 Improving maternal and child health are critical priorities in enhancing the agenda of quality of
58 healthcare to some of the most vulnerable groups [1-4]. Despite substantial progress and
59 different strategies that have been implemented by different countries, decline in maternal and
60 child mortality remains inadequate [5-7]. Maternal and child mortality is largely preventable
61 with current technology and it is unjustly and inequitably borne by low and middle income
62 countries with poorly resourced health systems [8]. Findings from the Kenya Demographic
63 Health Survey (2014) confirm that more effort is still needed towards reducing child mortality
64 and improving maternal health despite the progress that has been made [9].
65 The quality of healthcare services plays an important role in enhancing healthcare service
66 delivery in low income countries [10]. Poor quality of healthcare may lead to under-utilization of
67 services; and evidence shows that pregnant women are more likely to deliver in health facilities
68 if they are content with the care that they receive at the service delivery points [11, 12]. A study
69 conducted in rural Zimbabwe found that poor quality of services and negative attitudes of health
70 care workers hinder pregnant women from utilizing these services [13]. Where poor women have
71 access to what they perceive as high quality health care services, they increasingly seek
72 reproductive health care services and delivery in health facilities [14].

73 **Overview of the Output Based Approach reproductive health program**

74 Evidence from various studies has shown that there are significant direct and indirect cost
75 barriers in seeking reproductive and maternal health services, including treatment of
76 complications [8]. Furthermore, high expenditures arising from birth related complications
77 hinder many poor mothers from accessing health care and may push households further into
78 poverty [15].

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79 Two governments, Kenya and Germany, came together in 2005 to jointly support reproductive
80 health through the Output Based Approach (OBA) Program. The purpose of the program is to
81 expand utilization of selected reproductive health services among women aged 15-49 years
82 (reproductive age). The program targets mothers who are economically disadvantaged and living
83 in the counties of Kisumu, Kitui, Kiambu, and Kilifi, in addition to those who are in Korogocho
84 and Viwandani, which are informal settlements in the county of Nairobi. The reproductive
85 services offered include: safe motherhood (SMH) which comprise antenatal care (ANC)
86 attendance, caesarian section and vaginal delivery, birth related complication and post-natal care
87 up-to six weeks after delivery. Additionally, the program supports long-term family planning
88 (LTFP) methods such as intra-uterine contraceptive device (IUCD), implants, and tubal ligation.
89 Equally, the program offers counselling, medical examination, and treatment to vulnerable
90 mothers who encounter sexual gender-based violence as has been shown by other authors [16,
91 17].
92 OBA aims to support the impoverished population through subsidized health services [17]. The
93 program pays service providers on the basis of agreed outputs with pre-defined results, e.g.
94 facility-based deliveries and antenatal care visits attended, rather than financing the inputs [15].
95 Under the OBA model, vouchers for safe motherhood (SMH) and long-term family planning
96 (LTFP) services are sold at highly subsidized prices to prospective women (100 Kenya shillings
97 for both Family planning and the safe motherhood in Kilifi County and 200 Kenya Shillings for
98 safe motherhood and 100 Kenya Shillings for family planning in other counties – 1 USD (\$) is
99 approximately 100 Kenya shillings). For each voucher presented to accredited health facilities
100 (including private providers, government facilities, non-governmental organizations - NGOs, and
101 faith-based organizations - FBOs), services are provided and facilities reimbursed at a fixed rate

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102 [8, 15, 16, 18, 19]. Facilities are expected to use the reimbursed funds to improve infrastructure,
103 purchase some medical and non-medical supplies, and provide incentives to facility staff among
104 other things. The program directly finances the beneficiaries with highly subsidized vouchers,
105 and funding is reimbursed directly to accredited health facilities.

106 Donabedian theory evaluates three categories of quality of care: structure, which include inputs
107 such as equipment and personnel, process which focusses on the activities carried out by the
108 personnel, and outcomes which focuses on improved patient health such as good recovery,
109 survival, and client satisfaction [20-22]. While the program has been in existence since 2005,
110 little research has been done on aspects of patient perception of quality of reproductive
111 healthcare. For instance, one study on quality of the safe motherhood voucher schemes showed
112 enhanced quality of post birth care and a likelihood of superior quality of care for clients who
113 opted to participate in the voucher scheme for longer [23]. The study evaluated only the postnatal
114 aspect of care and did not touch on quality issues in overall totality. Hence, there is a paucity of
115 data on quality of reproductive care, satisfaction with OBA services, and the impact of such
116 programs. Therefore, this study evaluated perceived quality and satisfaction of the services under
117 the OBA voucher program in Kenya from a woman's perspective. Additionally, we evaluated
118 predictors of the factors that are related to perceived quality of reproductive care in OBA
119 facilities.

120 **METHODS**

121 **Study area**

122 The study was conducted in Kitui, Kilifi, Kiambu, and Kisumu counties as well as in the
123 Korogocho and Viwandani slums in Nairobi which are the OBA program sites. The services in
124 OBA sites are provided by public, NGOs, FBOs, and private service providers. All participating

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125 sites were offering SMH services (ANC, Delivery, treatment of delivery complications, and post-natal care up to 2 weeks), LTFP methods, and a small number was providing SGBV services.

127 **Study design and tool**

128 This was a cross-sectional study conducted in OBA sites using a semi-structured interview guide
129 administered through face-to-face in-depth exit interviews. Participants receiving OBA services
130 were asked to describe their perceptions of the quality of services and reasons for satisfaction
131 with the quality of services they had received in their current and previous visits. Perception was
132 measured using a questionnaire that was developed on the basis of literature review and suited for
133 a healthcare setting [10, 24]. The questionnaire consisted of a large number of items that were
134 found to be imperative in measuring quality of and satisfaction with care. Women were
135 specifically asked how they perceived the care they received during SMH visits, LTFP visits, and
136 SGBV visits. Besides, they were also asked about the information they received, the conduct of
137 the healthcare professionals, and adequacy of resources and services. The items were re-grouped
138 into 23 items measuring perception. There were two additional questions; one, on whether the
139 women were completely satisfied with the services and two, on the reasons for satisfaction or
140 dissatisfaction. Perceived quality of services was rated on a five point Likert Scale 1 being “
141 Completely Disagree”, 2 “Disagree”, 3 “Agree”, 4 “Completely Agree”, and 5 “Do Not Know”.

142 **Sampling design**

143 In selecting participants, a multistage sampling technique was used to select the facilities
144 offering OBA services. First, all OBA facilities were classified according to type of ownership-
145 public and private and grouped according to County. Classification has been described elsewhere
146 [16]. Within each County, a representative sample of facilities both public, NGOs, FBOs and
147 private facilities was randomly selected. In the second stage, a conservative sample size was

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148 calculated to be 313 respondents. In order to determine the sample size the formula developed by
149 Cochran [25] for proportion that are larger: $n = \frac{z^2 pq}{d^2}$, where n =was the number of clients/
150 respondents, z= is the critical value for standard normal distribution for the 95% confidence
151 interval around the true population (1.96), p= estimated proportion utilising OBA services
152 (which was based on the proportion of women of reproductive age living below the poverty line
153 in Kitui, Kiambu, Nairobi, Kisumu and Kilifi estimated at 28.56% [26]), q= represented 100-p,
154 and d= was the degree of accuracy (5%). The number of clients were equally divided amongst
155 the chosen facilities (5 clients). A simple random technique was used to select the OBA clients
156 who sought SMH, LTFP, and SGBV care at the time of the study. To randomly select the
157 participants at the facility, the researchers used Stat Trek Random numbers generators which
158 have been applied in other cross sectional studies [27]. The method uses statistical algorithm to
159 give random numbers and instructions on how to use it ([http://stattrek.com/statistics/random-](http://stattrek.com/statistics/random-number-generator.aspx)
160 [number-generator.aspx](http://stattrek.com/statistics/random-number-generator.aspx)). The researchers hit a calculate button and the number generator gave a
161 random number table with five numbers between 1 and 20. Subsequently, the interviewers then
162 interviewed the participants presented by these numbers on a single basis until the sample size
163 was obtained. After data collection, the questionnaires were then returned to the central OBA
164 program management offices in Nairobi after which they were checked for completeness before
165 inclusion into the database. Only fully completed questionnaires with all essential details were
166 included in the analysis and "do not know" response in the questionnaire was treated as a neutral
167 term for ease of interpretation.

Data analysis

169 The data were analysed using Statistical Packages for Social Scientists (SPSS) version 18.
170 Descriptive statistical analysis was carried out to describe the respondents' social demographic

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171 characteristics and the time taken to reach the facility either by bus or by foot. Additionally,
172 descriptive statistical analysis was conducted on the women' perceptions of OBA services. Data
173 were then subjected to exploratory factor analysis (EFA) of the 23 items to break down the items
174 into homogenous sub-scales coherent with the quality dimentions as proposed by Donabedian
175 [20]. Principal component analysis with orthogonal varimax rotation was conducted. In addition,
176 the Kaiser-Meyer-Olkin measure (KMO) was done to evaluate the sufficiency of data for EFA and
177 Bartlett's test of sphericity to evaluate the degree of patterned relationship between the
178 items. Additionally, reliability analysis was performed to test the reliability of the scale and
179 internal consistencies of extracted factors; whereby Cronbach's alpha coefficient was calculated.
180 The multivariate response model was used to study whether level of education, ante-natal clinic
181 visit, marital status, age, and County of residence were predictors of the factors related to
182 perceived quality of reproductive care (Table 1). The questions on overall satisfaction and reasons
183 for satisfaction were analysed using Microsoft excel 2010 and Pareto chart [28] was obtained for
184 the level of satisfaction.

185 **Table 1: Definition and measurement of variables used in multi linear regression model**

Variable definition	Measurement
Outcome variable	
Factors related to perceived quality of reproductive care	Staff conduct and practice, Healthcare delivery, Physical facilities, adequacy of resources, Accessibility of care, Perceived quality (Total Score)
Independent variables	
Level of education	1= No education, 2=Primary level, 3=Secondary level, 4=Tertiary level
Attendance to ANC clinic	1=Two or less, 2=Three times or more
Marital Status	1= Never Married, 2=Married, 3=Separated/Divorced, 4= Other
Age	1=24 and below, 2=25-34 years, 3=35-44 years, 4= 45 years and above
County of residence	1= Nairobi, 2=Kiambu, 3=Kilifi, 4=Kisumu, 5=Kitui

Ethical Approval

The authorization to carry out the study was obtained from the Ministry of Health-Kenya as part of routine monitoring of the process (Development of the Health Sector, Health Financing Support and Output Based Approach, Phase III, BMZ-No. KENYA 2010 65853) of the OBA services. The proposal was approved by the health research unit of the Ministry of Health Kenya (MOH/HRD/1/ (32)). Additionally, permission was obtained from the county headquarters and hospital administrators to proceed with the study. Verbal informed consent for the study was obtained from every woman who agreed to participate. The interviewers explained the purpose of the study to the mothers in their local dialect (language) and asked them whether they were willing to participate. For those who agreed, the interviewer indicated a unique patient identifier and the date of the interview on the front page of the questionnaire before proceeding with the interview and data were only used for the study.

RESULTS

200 The study was conducted in 65 OBA accredited facilities (18 FBOs, 2 NGOs, 18 private, and 27
 201 public) in Kiambu, Nairobi, Kilifi, Kisumu, and Kitui (Table 2).

202 **Table 2: Number of facilities where interviews were conducted**

	FBO	NGO	Private	Public	totals
Kiambu	3	0	3	3	9
Nairobi	1	1	1	1	4
Kilifi	2	0	3	8	13
Kisumu	5	1	5	6	17
Kitui	7	0	6	9	22
Total	18	2	18	27	65

204 **Socio-demographic data of the respondents**

205 Out of a sample of 313 respondents, 254 were included for analysis making the response rate
 206 81.2%. Fifty nine questionnaires that had no imperative details on the independent variables
 207 (levels of education, attendance to ANC clinic, marital status, and age) and where more than two
 208 attributes of quality were missing, were excluded from the analysis. The details were considered
 209 important to avoid bias in the multivariate response model and exploratory factor analysis as was
 210 shown in other studies [10, 29]. There were 198 women with Safe Motherhood (SMH) contacts,
 211 55 with Long Term Family Planning (LTFP) contacts, and one with a Sexually Gender Based
 212 Violence (SGBV) contact. All respondents were female, most of them married (83.1%) with
 213 primary level of education (57.9%). Majority of the respondents were in the age group of 24 and
 214 below (53.9%) followed by those in the age group 25-34 years old (38.6%) (Table 3) below.
 215 Mean age of the respondents was 24.67 years old (SD 6.127), and mean time taken to get to the
 216 facilities by foot and bus was 93.95 minutes (SD 304.877) and 36.83 minutes (SD 43.993)

217 respectively. Additionally, majority of the women had attended ANC clinics “three times or
 218 more” (76%).

219 **Table 3: Socio demographic characteristics of the respondents**

Variable	Frequency (%)		
Age	24 and below	137(53.9)	
	25-34	98(38.6)	
	35-44	19(7.5)	
	45+	0(0)	
Marital status	Single	32(12.6)	
	Married	211(83.1)	
	Separated/ Divorced	11(4.3)	
	Other	0(0)	
Number of ANC visits attended	Two or less	61 (24)	
	Three times or more	193 (76)	
Education	No Education	16(6.3)	
	Primary	147(57.9)	
	Secondary	68(26.8)	
	Tertiary	23 (9.1)	
	Age	Time by Foot in minutes	Time by vehicle in minutes
Mean	24.67	93.95	36.83
Median	24	30	30
Std. Deviation	6.127	304.877	43.993
Range	43	4320	300

221 **Women’ perception of services provided**

222 The overall mean score for women’ perception of quality of services was 3.43 (SD 0.629) (Table
 223 4), implying that the majority perceived the quality of OBA services to be high. Specifically,
 224 women were happy with the way healthcare providers were handling birth related complications.
 225 Furthermore, women highly rated staff as “compassionate”, “respectful”, “able to prescribe drugs
 226 that are needed”, and “able to examine post-partum women well.” However, the adequacy of the

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4 227 number of facility staff was rated fairly low implying that some facilities did not have enough
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10 229 **Table 4: Mean scores of perceived quality of care in the OBA sites**

Attributes	Mean	SD
Number of Staff in the facility is adequate	3.10	0.826
Waiting rooms, examination rooms, and other rooms are adequate	3.24	0.757
Clean water for clients is adequate	3.31	0.777
Hand washing facilities for clients is adequate	3.33	0.691
Bathing facilities for clients is adequate	3.42	0.878
Toilet facilities for clients is adequate	3.28	0.785
Environment of the facility is clean	3.35	0.629
Equipment is well suited for detecting medical problem	3.46	0.722
Complications handled satisfactorily	3.62	0.623
There is enough privacy while handling cases	3.32	0.653
You received enough information for the services to help you make decisions	3.44	0.586
Staff examine post-partum women well	3.55	0.607
Staff prescribe drugs that are needed	3.55	0.566
There is adequate supply of drugs in facility	3.37	0.688
Patient can easily obtain drugs from the facility	3.43	1.345
Information provided on danger sign adequate	3.30	0.705
Staff have adequate knowledge of dealing with FP, Deliveries, CS, SGBV cases	3.54	0.581
Staff very capable of finding what is wrong with patients	3.53	0.553
Staff are OPEN	3.51	0.595
Staff are Compassionate	3.56	0.557
Staff are Respectful	3.56	0.586
Staff have adequate devotion to clients	3.51	0.575
Staff are Honest	3.54	0.627
Overall mean for the 23 attributes	3.43	0.629

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57 231 **Factor analysis results**

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232 Principal component analysis with orthogonal varimax rotation was conducted where the Kaiser-
233 Meyer-Olkin measure (KMO) was 0.893 well above 0.5 suggested by Kaiser, 1974 [30] as
234 shown in Table 5 indicating that the data was sufficient for exploratory factor analysis (EFA).
235 The Bartlett's test of sphericity $X^2(276) = 2866.439, P < 0.001$ (Table 5) showed that there was
236 some degree of patterned relationship between the items. Items that had measures of variance
237 (eigenvalues) equal to or greater than 1, with factor loading above 0.4, and factors that had three
238 or more items were retained and used for EFA [29]. EFA used five factors which accounted for
239 61.5% of variance explained by the data after extraction. These were used in defining five sub-
240 scales (Table 5). All five factors were included in the analysis because each had more than three
241 variables as suggested by Hair et al., [29]. The five factors were labeled as follows: F1- "Staff
242 conduct and practice" which had five variables (Staff are compassionate, staff are respectful,
243 staff are devoted to clients, staff are open, staff are honest) and explained most of the variance;
244 F2- "Healthcare delivery" which had seven variables (Staff very capable of diagnosing patient's
245 illness , complications handled satisfactorily, staff examined post-partum women well, client
246 received adequate information for the services to help making informed decisions, equipment is
247 well suited for detecting medical problems, staff prescribed drugs that are needed, and staff have
248 adequate knowledge in dealing with family planning issues, vaginal deliveries, caesarean
249 deliveries, sexual and gender based violence cases); F3-"physical facilities" which had five
250 variables (Clean water is adequate, there is enough privacy while handling cases, toilet facilities
251 are adequate, hand washing facilities are adequate, environment of the facility is clean); F4-"
252 adequacy of resources" which had three variables (Information provided on danger signs is
253 adequate, bathing facilities for clients is adequate, number of Staff in the facility is adequate);
254 and F5- "Accessibility of care" which had three variables (Patient can easily obtain drugs from

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255 the facility, there is adequate supply of drugs in facility, waiting rooms, examination rooms, and
256 other rooms are adequate). Most of the factor loading were greater than 0.4 and the
257 communalities ranged from 0.815 to 0.499 showing that the factor solution had identified the
258 variance associated with each factor.

259 **Table 5: Factor analysis result of OBA clients' perceptions (n=254)**

		Rotated Component Matrix					Communalities after extraction
		Factors					
		F1	F2	F3	F4	F5	
11	Staff are Compassionate	0.865					0.815
12	Staff are Respectful	0.861					0.808
13	Staff have adequate devotion to clients	0.790					0.723
14	Staff are OPEN	0.756					0.668
15	Staff are Honest	0.668					0.559
16	Staff have adequate knowledge of dealing with FP, Deliveries, CS, SGBV cases		0.753				0.679
17	Staff very capable of finding what is wrong with patients		0.691				0.688
18	Complications handled satisfactorily		0.656				0.537
19	Staff examine post-partum women well		0.619				0.531
20	You received enough information for the services to help you make decisions		0.558				0.605
21	Equipment is well suited for detecting medical problem		0.540		0.469		0.528
22	Staff prescribe drugs that are needed		0.501				0.528
23	Clean water for clients is adequate			0.746			0.589
24	There is enough privacy while handling cases			0.656			0.663
25	Toilet facilities for clients is adequate			0.635	0.402		0.643
26	Hand washing facilities for clients is adequate			0.613			0.548
27	Environment of the facility is clean	0.438		0.610			0.699
28	Information provided on danger sign adequate				0.696		0.524
29	Bathing facilities for clients is adequate				0.580		0.510
30	Number of Staff in the facility is adequate		0.444		0.573		0.567
31	Patient can easily obtain drugs from the facility					0.799	0.655
32	There is adequate supply of drugs in facility					0.469	0.570
33	Waiting rooms, examination rooms, and other rooms are adequate					0.447	0.499
34	Eigenvalue	8.502	1.929	1.507	1.121	1.077	14.136
35	% of variance explained by the factor after extraction	18.12	14.94	12.34	9.42	6.64	61.46
Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization.							
36	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.						0.893
37	Bartlett's Test of Sphericity	Approx. Chi-Square					2866.439
38		Df					276
39		Sig.					.000

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261 **Reliability analysis results**

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262 The reliability (internal consistency) of the sub-scales exhibited by Cronbach’s alpha ranged
263 from 0.525 for F5 (showing low internal consistence) to 0.904 for the total score (indicating high
264 internal consistence) (Additional file 1: Table S1 shows this in more details). The slightly lower
265 scores for F4 and F5 can be explained by the small number of items in the group and has been
266 explained by writers such as Haddad et al, [24]. Means of all five factors were fairly above 3 and
267 they were fairly equal to median scores showing that there was no skewed distribution on the
268 perception of the women.

269 **Socio-demographic predictors of quality of reproductive health services**

270 Regression analyses were performed with the different sub-scales and the total score for
271 perceived quality of OBA services as outcome variables (**Error! Reference source not found.**).
272 The B values (beta) were interpreted directly as shown in Additional file 2: Table S2 and
273 Additional file 3: Table S3. The results of the regression analyses indicate that marital status and
274 the number of Ante Natal clinic (ANC) visits play insignificant roles in determining the
275 perception of quality of OBA services within different factors except for the overall perceived
276 quality of reproductive health care (Additional file 2: Table S2 and Additional file 3: Table S3).
277 However, counties (areas of residence) are a significant determinant of the level of perception of
278 quality. For instance, four factors (staff conduct and practice, physical facilities, adequacy of
279 resources, accessibility of care) and the total score are perceived poorly by women in Nairobi,
280 Kitui, Kilifi, and Kisumu as compared to Kiambu County (reference category).

281 The results showed that staff conduct and practice is perceived poorly by those aged 15-25 years
282 as compared to those aged 25-34; and perceived poorly by those with primary education as
283 compared to those with secondary education. Healthcare delivery is judged poorly by those with
284 tertiary education as compared to women with primary education, and poorly by those aged 15-

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285 24 compared to those aged 25-34 years old. Additionally, physical facilities are perceived
286 positively by those without education or with secondary education as compared to primary
287 education. Those without education perceive adequacy of resources more favorably than those
288 with primary education. Accessibility of care is judged negatively by individuals aged 15-24 and
289 34-44 years as compared to individuals aged 25-34 years old. Overall, the quality of OBA
290 services was judged higher by both those without education and with secondary education
291 compared to those with primary education, and those who have attended two or less ANC visits
292 compared to those who attended three times or more.

293 The variance explained by various factors (R^2) is higher than 10% for staff conduct and practice,
294 healthcare delivery, physical facilities, and adequacy of resources. In general, this shows that
295 only for perceived staff conduct and practice and for perceived adequacy of resources, a
296 substantial part of the variance is explained by socio-demographic factors.

297 **Overall level of satisfaction**

298 All clients were asked whether they were completely satisfied with the services provided at the
299 OBA sites. Ironically, 88.9% of the clients revealed they were satisfied despite the challenges
300 with the issues that have been addressed above (Additional file 4: Figure S1). Satisfaction was
301 presented using Pareto chart shown in Additional file 4: Figure S1 where reasons cited for
302 satisfaction included courteousness by the staff and little waiting time to be seen by medical
303 staff. Other reasons included welcoming and friendly staff (10%), free service (8.5%), and
304 quality service (5.5%). On the other hand, two clients were dissatisfied with the service because
305 of lack of transport to the facility while one client was dissatisfied because of long waiting time
306 before being attended to by the staff (Figure 1 and Figure 2).

307 **Insert figure 1 and figure 2**

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308 **DISCUSSION**

309 Our results show that F1- “staff conduct and practice” was judged relatively high. This shows
310 that components of staff conduct and practice which are honesty, compassion, respect, openness,
311 and devotion to work of healthcare workers provided a significant influence on the perceived
312 quality of reproductive health services. Our findings are congruent with results from a study in
313 Malawi which showed that women were overall satisfied with the level of maternal care at the
314 facilities because they were respected, welcomed and listened to [31]. Our results also support
315 the findings of a cross sectional study in Ghana of mothers who delivered vaginally in two public
316 hospitals and revealed that they were treated with respect [32]. Additionally, the study is
317 consistent with a study in Nicaragua where user satisfaction with vouchers was highly correlated
318 to satisfaction with clinic reception and clarity of doctor’s explanations [33]. From the findings,
319 we elucidate that women tend to associate the attitude of healthcare workers with the quality of
320 care.

321 The quality of F2- “Healthcare delivery” was rated as relatively good. For instance, the
322 respondents were happy with the competence of staff in the facilities who were capable of
323 handling complications and giving enough information. This is analogous to a study in Malawi
324 with respect to handling complications [35]. The findings were different from a study in Mulago,
325 Uganda where only 38% of the mothers revealed that they had received adequate information on
326 the symptoms and expected health problems [34]. However, in Serbia, mothers were content
327 with the information given regarding their rights during and after delivery by the midwives
328 which partly support our findings [35]. Additionally, women perceived that staff had adequate
329 knowledge in dealing with SMH, LTFM, SGBV issues. These findings suggest that strong focus
330 on the quality of care has contributed to increased service delivery in OBA sites.

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331 Women judged F3 - “physical facilities”, F4 - “adequacy of resources”, and F5 - “Accessibility
332 of care” as relatively moderate. Most women perceived that clean drinking water, availability of
333 bathing facilities especially after delivery, and privacy when being examined, were essential
334 components of a good healthcare facility. In essence, toilet and hand washing facilities enhanced
335 the level of perceived quality of care. Moreover, within OBA sites, perceived quality of care was
336 linked to adequate number of staff and the supply of drugs. Findings were comparable to a study
337 in India, which indicated that women were happy with the readiness of primary drugs
338 particularly during complications and availability of health workers [36]. Drugs are important
339 determinants of quality of care and the absence of drugs could lead to impaired perception of the
340 quality of services [10].

341 Our findings also reveal that women are content with majority of quality aspects despite the
342 number of healthcare workers being low. This can probably be explained by the few number of
343 health workers going way above their abilities and the workload to ensure that the mothers
344 receive the services they need. Women seem to be aware of the shortage of workers, but
345 appreciate the services they provide.

346 An important finding from this study was that the majority of respondents were young people of
347 24 years and below who made at least three ANC visits, which is comparable with the Kenya
348 Demographic Health Survey (KDHS) 2014 results [9]. However, women needed relatively long
349 hours to reach OBA facilities which was comparable to other studies [15, 19, 36] and greatly
350 influenced women’ perception of the quality of care.

351 The study has revealed that area of residence played a key role in determining the level of
352 perception of quality of care of OBA services as compared to other socio-demographic
353 characteristics. However, the study identified some impact of ANC visit numbers, level of

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354 education, and age on the perception of quality which is in congruent with results from other
355 sub-Saharan African studies [32, 37].

356 **Study limitations**

357 In studies involving perception of quality and satisfaction with the level of care, there is a
358 propensity to provide favorable answers to the questions [24]. Thus, in as much as the study is
359 relevant, it should be used with caution. Besides, generalizing it to other countries is not
360 warranted. Secondly, the sampling design provided enough users of OBA services to examine
361 the research question; however, in some remotely located facilities, we did not find the
362 designated number of women because they experienced difficulty in accessing the facilities.
363 Thirdly, women were interviewed within the vicinity of the clinic or hospital and this may have
364 influenced the way they answered the questions.

365 **Recommendations**

- 366 a. Health care managers can use our findings as a guide to evaluate different areas of
367 healthcare delivery; thereby, improving resources and physical facilities that are crucial in
368 elevating women' level of satisfaction with the quality of care. Moreover, healthcare
369 workers can use the study as a guide to enhance accessibility of care so that improved levels
370 of satisfaction can be obtained.
- 371 b. It is imperative for future programs to inculcate transport vouchers to reduce time to get to
372 the facilities, as it is a potential determinant of perception of quality.
- 373 c. For the program management unit (PMU), the index for perceived quality and women'
374 satisfaction should be incorporated into practice using the results from this study. While
375 different facilities reacted differently to reimbursements and incentives, some facilities
376 improved their structures and were able to attract more women who are more satisfied.

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377 Therefore, it is imperative to introduce mechanisms in the voucher strategies that can
378 capture perceived quality and satisfaction routinely. The 23 item questions that have been
379 translated into five factors shows the key areas that the PMU need to improve.

380 **CONCLUSION**

381 Conduct and practice of healthcare workers is an important determinant of women’s perception
382 of quality. Women take keen interest in evaluating staff attitudes. Healthcare workers within
383 different areas of residence need to implement different strategies unique to the area that will
384 pull and improve levels of satisfaction and perception of the quality of healthcare.
385 Women were overall satisfied with the way they were being handled at the OBA facilities. A
386 future study could also assess whether healthcare providers’ perception of care is different from
387 users’ perception. Policy makers should respect women’ quality perceptions within OBA
388 services and work towards improving quality of care and enhancing utilization.

389 **List of abbreviations**

390 KDHS: Kenya Demographic Health Survey; OBA: Output Based Approach; MDGs: Millennium
391 Development Goals; SMH: Safe Motherhood; LTFP: Long-Term Family Planning Methods;
392 SGBV: Sexual Gender Based Violence; NGOs: Non-Governmental Organisations; FBOs: Faith
393 Based Organisations.

394 **DECLARATION**

395 **Ethics approval and Consent to participate**

396 The study was approved by the health research unit of the Ministry of Health Kenya
397 (MOH/HRD/1/ (32)). Additionally, permission was obtained from the county headquarters and
398 hospital administrators to proceed with the study. Verbal informed consent for the study was
399 obtained from every woman that agreed to participate as approved by the ethics committee. The

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400 interviewers explained the purpose of the study to the mothers in their local dialect (language)
401 and asked them whether they were willing to participate. For those who agreed, the interviewer
402 indicated a unique patient identifier and the date of the interview on the front page of the
403 questionnaire before proceeding with the interview and data were only used for the study.

404 **Consent to publish**

405 Not applicable.

406 **Availability of data and material**

407 Data for this report are under the primary jurisdiction of the Ministry of Health in Kenya.
408 Enquiries about using the data can be made to the head of the Program Management Unit for the
409 OBA study.

410 **Competing interests**

411 The authors declare that they had no competing interests when conducting the research.

412 **Funding**

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414 the Ministry of Health – Kenya as part of the OBA program adopted as a flagship program under
415 the National Vision 2030 (Development of the Health Sector, Health Financing Support and
416 Output Based Approach, Phase III, BMZ-No. KENYA 2010 65853).

417 The funders had no role in the design of the study, analysis, interpretation of the data, and
418 drafting or submitting this manuscript.

419 **Authors Contribution**

420 BO and UK were involved in the conception and design, data analysis and interpretation, drafted
421 the manuscript and are accountable for all aspects of the work. SK, CO, and SOM were
422 responsible for data curation, formal analysis, and methodology. SMK, ST, NM, SG, BB, MR,

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423 JK and CN participated in the formulation of the methodology, investigation and revision of the
424 manuscript. All the authors read and approved the final manuscript.

425 **Acknowledgement**

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Figures

Figure 1: Reasons for satisfaction with the OBA services

Figure 2: Reasons for dissatisfaction with the OBA services

Additional files

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530 **Additional file 1: Table S1: Reliability analysis of Factors and total score**

531 **Additional file 2: Table S2: Factors related to perceived quality: Multivariate response**
532 **model for F1, F2, and F3**

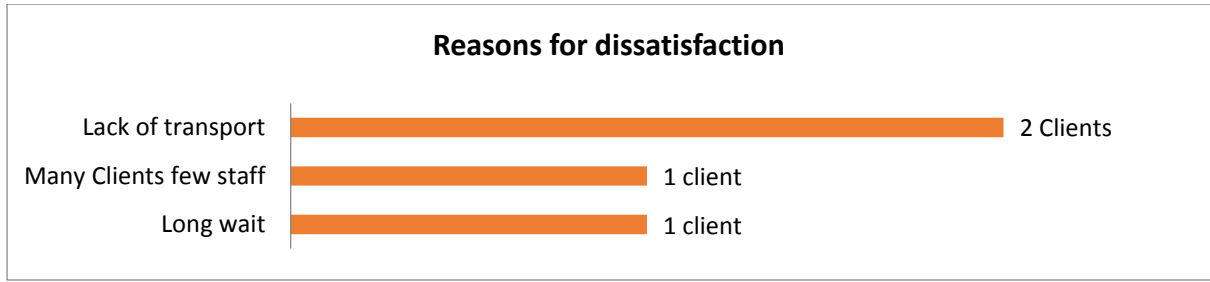
533 **Additional file 3: Table S3: Factors related to perceived quality: Multivariate response**
534 **model for F4, F5, and Total Score**

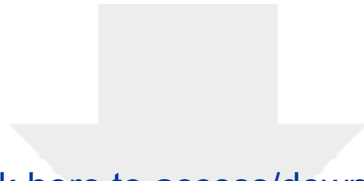
535 **Additional file 4: Figure S1: Pareto chart for the level of satisfaction of clients with the**
536 **OBA services**

537 **Additional file 5: Data collection tool for RH-OBA clients**

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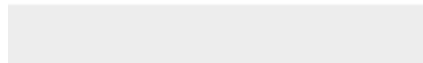





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Supplementary Material

Reliability analysis of Factors and total score.docx





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Factors related to perceived quality _F1, F2, and
F3.docx



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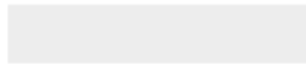
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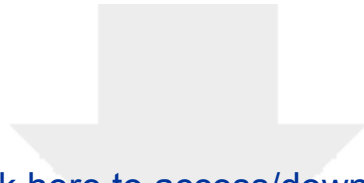


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Supplementary Material

Pareto chart for the level of satisfaction of clients.docx





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Supplementary Material

Data collection tool for RH-OBA clients.pdf

