

Health System Responsiveness and Its Associated Factors Among Outpatients in Primary Health Care Facilities, Asagirt District, NorthShewa Zone, Ethiopia, 2021: Cross Sectional Study Design

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1 **Health system responsiveness and its associated factors among**
2 **outpatients in primary health care facilities, Asagirt District, North**
3 **Shewa Zone, Ethiopia, 2021: Cross sectional study design**

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18 **Abstract**

19 **Background:** Health system responsiveness is defined as the outcome of designing health facility
20 relationships in such a way that they are familiar and respond appropriately to patients' universally
21 legitimate expectations. Even though different strategies have been implemented to measure
22 responsiveness, only scanty evidence exists in Sub-Saharan Africa. In Ethiopia information about
23 the level of health system responsiveness among outpatients is scant. Assessing responsiveness
24 could help facilities in improving service delivery based on patient expectations.

25 **Objective:** The study aimed to assess health system responsiveness and associated factors among
26 outpatients in primary health care facilities, Asagirt District, North Shewa Zone, Ethiopia, 2021.

27 **Methods:** Facility-based cross-sectional quantitative study was implemented between 30th March
28 and April 30/2021. A systematic random sampling technique was employed to select 423
29 participants, and interviewer-administered data were collected using a structured and pretested
30 questionnaires. Both bivariable and multivariable logistic regressions were employed to identify
31 factors that have an association with health system responsiveness. Adjusted Odds Ratio with their
32 corresponding 95% CI was used to declare factors associated with health system responsiveness.
33 A p-value less than 0.05 was used to declare statistical significance in this study.

34 **Results:** The overall health system responsiveness was 66.2% (95% CI: 61.4% - 70.7%).
35 Confidentiality and dignity domains were the highest responsiveness score. Health system
36 responsiveness was higher among satisfied outpatients (AOR: 9.9, 95% CI: 5.11-19.46), utilized
37 private clinics (AOR: 8.8, 95% CI: 4.32-18.25), and no transport cost (AOR: 1.7, 95% CI: 1.03-
38 2.92) in the study setting.

39 **Conclusion:** Overall health system responsiveness was higher as compared to other case-specific
40 study in Ethiopia. The domains of Autonomy, Waiting time, Basic amenities, and Choice were
41 identified as vital areas needing the effort to raise responsiveness of health care service in the
42 District. HSR was higher in private than public healthcare facilities, among satisfied clients and
43 those who didn't pay for transport on their way to the health facility than their counterparts. Thus,
44 enhancing patient satisfaction, using input from service users, Collaboration, and experience
45 exchange between public and private facilities will be important interventions to improve HSR.

46 **Keywords:** Health system responsiveness, Outpatients, Asagirt, Ethiopia

47 **Background**

48 All health systems are expected to achieve the goals of good health, responsiveness to the
49 expectations of the population, and fairness of financial contribution [1-4]. From these goals;
50 health system responsiveness (HSR) is defined by the World Health Organization (WHO) as “how
51 well the health system meets the legitimate expectations of the population for the non-health
52 enhancing aspects of the health system” [5]. Health systems can be evaluated as a whole in any
53 type of interaction by summarizing into responsiveness [6, 7]. The concept entails the experience
54 of people's fundamental interaction and different factors shaping their interaction with the health
55 system. This intern can help to anticipate and adapt to the existing and future health needs for a
56 better health outcome [1, 5, 8]. To provide appropriate and efficient care delivery, more responsive
57 and updated health systems with giving attention to intrinsic values and safeguarding of the rights
58 of patients are needed [2, 4, 9-12]. However, the burden of diseases and conflicts in low and
59 middle-income countries threatening the capacity of health systems to respond to the population
60 they serve [13-15]. But the fulfillment of patient expectations is more important than other factors
61 for a better health outcome [16]. If health system responsiveness has improved other associated
62 health outcomes improved as well [7].

63 Responsiveness has been operationalized into eight domains as respect for the dignity of persons;
64 autonomy to participate in health-related decisions; confidentiality; prompt attention; adequate
65 quality of care; communication; access to social support networks; and choice of health care
66 providers [1, 2, 8, 17].

67 Despite challenges for measuring responsiveness, additional refinement of strategy and consistent
68 monitoring are needed to achieve its goal [5, 14, 18]. Notably, those low and middle-income
69 countries are needed to give attention to equity health access at local and global aspects [19-21].
70 Studying health system responsiveness is needed to improve patient experiences and their
71 satisfaction in the sphere of non-medical aspects [22-25]. A patient-centered and acceptable quality
72 across the continuum of care is essential through considering social norms, relationships, values,
73 and trust within societies [26]. The measurement of health system responsiveness also will help to
74 identify the level of performance health facilities [1].

75 For a better and comprehensive understanding of non-health enhancing aspects of health systems,
76 measuring health care responsiveness is necessary [1, 14]. This is because the fulfillment of
77 patients' expectation is more important than other factors for a better health outcome [16].

78 Factors like Community-related factors, socio-economic factors, and environmental-related
79 factors affect the responsiveness of health care systems during the current epidemic crisis [27].
80 These create gaps in the responsiveness performance to meet the expectation of the clients
81 regarding how they should be treated and the convenience of the environment in which they are
82 treated [28]. Equity with good interaction targeting all sections of the society in a health facility is
83 very important to improve health care utilization [23, 29]. Generally, to improve responsiveness,
84 it needs performance evaluation and higher spending level from a policy perspective in low-
85 income settings [4, 29]. Although WHO has a strong commitment to the implementation of the
86 strategy for evaluating responsiveness, the measurement is still challenging [5]. Due to little
87 evidence on the responsiveness of the health system in the primary health care settings [30], there
88 is a need to interview patients to know their experiences with the health system [31]. However,
89 little is known in African countries [29, 32, 33] particularly, in Ethiopia, there is no systematically
90 organized study addressing health system responsiveness in a domain-based manner. It is,
91 therefore, essential to explore information on responsiveness to improve and progress towards
92 universal health coverage(UHC) [14]. Therefore, this study was aimed to fill this research gap by
93 assessing health system responsiveness, and associated factors among outpatients from primary
94 health facilities.

95 **MAIN TEXT**

96 **Methods**

97 **Study settings**

98 The study was conducted in Asagirt District, North Shewa Zone, Ethiopia. The District is 125.5
99 Kilometers (Km) far from Addis Ababa, the capital city of Ethiopia. It has 15 kebeles (the lowest
100 administrative unit). Asagirt District is located in North Shewa Zone, Amhara National Regional
101 State of the eastern edge of Ethiopia. The 2020 projected population of the District was 57,320.
102 Of whom 30,240 were males. The District has a total of 20 functional health facilities: 3 public
103 health centers, 2 primary private clinics, and 15 health posts (community-level health facilities
104 providing basic preventive and medical care). In 2021 a total of 52 health professionals and 23
105 health extension workers were served the District. According to the District health managers’
106 report, there was an average of one thousand seven hundred (1700) patients visiting health centers
107 and private clinics within a month.

108 **Study design and Period**

109 A facility-based cross-sectional quantitative study design was conducted to assess health system
110 responsiveness among outpatients from 30th March to April 30 /2021.

111 **Population**

112 All outpatients who received health care services in primary health care facilities residing in
113 Asagirt District constitute the source population of this study. Patients who received health care
114 services as an outpatient in the selected primary health care facilities were included in the study.
115 Whereas patients whose age below 18 years, and all outpatients who were utilized health posts
116 were excluded from this study.

117 **Sampling and Sample size**

118 The sample size for health system responsiveness was determined by using single population
119 proportion formula [34]. With an assumption of a 50.0% probability of the responsiveness of
120 patients (there is no local data available on the subject for outpatient and to get maximum sample
121 size), 95% of confidence level ($Z_{\alpha/2} = 1.96$), Margin of error=5%. The calculation indicated the
122 sample size of 384.16. After adding a 10 % non-response rate the total sample size was estimated
123 to be 423 clients. Computed as $n = \frac{(Z_{\alpha/2})^2 P (1-P)}{d^2}$

124 d^2

125 $n = \frac{(1.96)^2 \cdot 0.5 \cdot (1-0.5)}{(0.05)^2} = 384.16$

126 $(0.05)^2$

127 $n = 384.16 + 38.416 = 423$

128 **Sampling technique and procedure**

129 Firstly, the sample size was proportionally allocated to each facility. To select the calculated
130 sample size, a systematic random sampling technique from all five primary health care facilities
131 was employed (there are five primary health care facilities in the District excluding health posts).
132 Then at every K^{th} interval ($K = N/n$) where N = total clients who was received health care services
133 within the study period n = required sample size, thus $K=1700/423=4$. Then, the first patient was
134 randomly identified from 4 by lottery method, and then every 4th patient was taken into the study
135 till the required number of study participants for each facility in the outpatient department was
136 reached (fig.1).

137 **Variables and measurement**

138 Health system responsiveness of outpatient service was the dependent variable. It was measured
139 the quality and interaction of the non-clinical aspects of health care provision (patients' opinions
140 and experiences about health care services they received). The index was customized from WHO
141 multi-country studies and from the report of Ethiopia's health sector transformation plan (HSTP
142 II) [4, 7, 35, 36]. The 28 items were divided among 7 domains as communication (4),
143 Confidentiality (3), Quality of basic amenities (5), Dignity (4), Choice (3), Prompt attention (5),
144 Autonomy (4). The eighth domain (access to social support network) was not assessed since it is
145 used for assessing inpatients (hospitalization) only [11, 31]. All the 28 items were computed and
146 then it was dichotomized as “acceptable” and “unacceptable” by the demarcation threshold
147 formula as: $\frac{\text{Total highest score} - \text{Total lowest score}}{2} + \text{total lowest score}$ [37-39]. Accordingly,
148 those who scored 73 and above HSR was considered as “Acceptable” and below considered as
149 “Unacceptable”.

150 Likewise, all the seven domains were added separately and grouped as good and poor by the above
151 formula [37-39]. Above the cut-off point to determine “Good” performance, while including cutoff
152 point and below scores were considered as “Poor” for each domain independently.

153 **Perceived satisfaction of clients:** Patient satisfaction was measured by using 5 questions on a
154 five-point Likert scale with five response categories (1 ‘very dissatisfied’ to 5 ‘very satisfied’),
155 and finally it was grouped by using the demarcation threshold formula [38, 39]. And those who
156 scored 15 and above were considered as “Satisfied” whereas below 15 was considered as
157 “Dissatisfied”.

158 **Perceived quality of care score:** assessed by 12 questions of the clients’ perception about the
159 services they offered, professionalism of provider as well as, the patient values and interests in the
160 services. Then it was dichotomized into “high” for those who scored above 37 and “low” for those
161 who scored 37 and less [37].

162 **Out of pocket payment;** was assessed by Yes/ No question [23].

163 **PHQ-9 :** was assessed by 9 depression questions to assess whether the patient has depression or
164 not ranging from 1 ‘always’ to 4 ‘not at all’ after which it was dichotomized as “poor” and “good”
165 with a cutoff point of 23 [40].

166 **Data collection tools and procedure**

167 Closed-ended interview questionnaires adapted from WHO health system responsiveness and
168 questionnaires developed from reviewing different related literatures, were used for data
169 collection. The questionnaire was prepared in English first, then translated to Amharic (local
170 language), and then retranslated back to the English language to check its consistency. The
171 reliability of the tools was checked by Cronbach’s alpha reliability test. Accordingly, values for
172 PHQ-9 (0.87), for satisfaction (0.89), for perceived quality of health care (0.96), and average
173 Cronbach’s alpha for all domains was 0.92, all showed high reliability above the required cut-off
174 0.70. The questionnaire mainly includes socio-demographic assessment, health facility-related,
175 WHO responsiveness assessment questionnaires, perception on quality of care, and health
176 insurance membership. The data collectors went and collected the data from participants’ after
177 they have received the services on their way to the home (exit interview). The data were collected
178 daily. A data collector has approached by introducing him/her self and interviewed the selected
179 respondent after informed consent was obtained.

Data quality assurance

180
181 Before the data collection, one-day training was given for all data collectors and supervisors by
182 the principal investigator about the mechanism of data collection to have a similar understanding.
183 Five B.Sc. Health Officers for data collectors and two supervisors of the same field who were
184 working out of study areas participated in the data collection process. The training process focused
185 mainly on the objective of the study, how to ask and fill the questionnaires, selection criteria of
186 patients and how to approach the respondents without introducing biases. Additionally, the facility
187 workers were not allowed either to see or hear the patients' response. During the data collection,
188 data collectors were assigned for the supervisor for better monitoring. Before starting the actual
189 data collection, the data collectors had practiced in the field and the questionnaires were pretested
190 on 21 (5%) patients in the nearby District (Angolela and Tera District). The data collectors and the
191 principal investigator had assessed the clarity and completeness of the questionnaires. Findings
192 and experiences from the pretest were utilized in modifying the data collection tool. When there
193 was any problem during the data collection process, the investigator had discussed it with the
194 supervisor and a solution was given on a daily bases.

Data processing and analysis

195
196 Once the collected data were checked for completeness then the data were entered into the Epi-
197 data version 4.6 Software Package. Then it was exported to Stata version 14 statistical software
198 packages for cleaning, coding, and analysis. A two-stage data analysis (descriptive and inferential)
199 was conducted. The descriptive statistics were described using frequency, percentage, mean and
200 standard deviation and presented by a figure, table, and text. All continuous independent variables
201 were categorized. Normality tests such as kurtosis and skewness were employed to identify which
202 summary measure is appropriate to use. Multicollinearity among independent variables were
203 checked using variance inflation factor (VIF) and was found no multicollinearity (mean value =
204 1.13). Both bi-variable and multi-variable logistic regressions were employed. All explanatory
205 variables in binary logistic regression with a p-value of 0.25 and below were considered candidate
206 variables for multivariable logistic regression analysis to control confounding factors. In the final
207 model, Adjusted Odds Ratio (AOR) with their corresponding 95% confidence intervals (CI) was

208 used to declare factors associated with health system responsiveness. A p-value less than 0.05 was
209 used to declare statistical significance in this study.

Results

210 Socio-demographic characteristics of the study participants

211 A total of 417 outpatients were participated in the study, giving a 98.6% response rate. The median
212 age of the study participants was 33 years with an interquartile range of 25-49 years. And 40.8%
213 were aged between 18-29 years. More than two-thirds (69.6%) of the patients were from rural
214 residency. Of the study participants, 92.8% were Orthodox Christian followers (Table 1).

215 Table 1 : Socio-demographic characteristics of outpatients in Asagirt District primary health care
216 facilities, North Shewa Zone, Ethiopia, 2021 (n=417)

Variables	Frequencies (n)	Percentage (%)
Sex		
Male	226	54.2
Female	191	45.8
Age in years		
18-29	170	40.8
30-39	89	21.3
40-49	54	13.0
50 and above	104	24.9
Residence		
Rural	288	69.6
Urban	129	30.4
Religion		
Orthodox	387	92.8
Muslim	30	7.2
Occupational status		

Farmer	254	60.9
Government employee	53	12.7
Merchant	45	10.8
Others *	65	15.6
Current marital status		
Married	255	61.1
Not married**	162	38.9
Educational status		
Unable to read and write	70	16.8
Able to read and write	105	25.2
Primary (grade 1-8)	135	32.4
High school and above	107	25.6
Household monthly income(ETB)***		
>650	138	33.1
<=650	268	64.3
Unknown	11	2.6

217 **Notes:** *=student, private employee, daily laborer **=single, divorced, windowed ***=Ethiopian
218 Birr (currency)

219 **Health service accessibility-related characteristics**

220 Nearly sixty eight percent of the participants utilized public health care facilities. More than half
221 (56.1%) had traveled one hour and below to reach the health facility (Table 2).

222 **Patient-related characteristics**

223 Most (81.3%) of the respondents were good perceived satisfaction. Regarding patient health
224 quality (PHQ-9) more than three-fourth (84.6%) had good perceived patient health quality (Table
225 3).

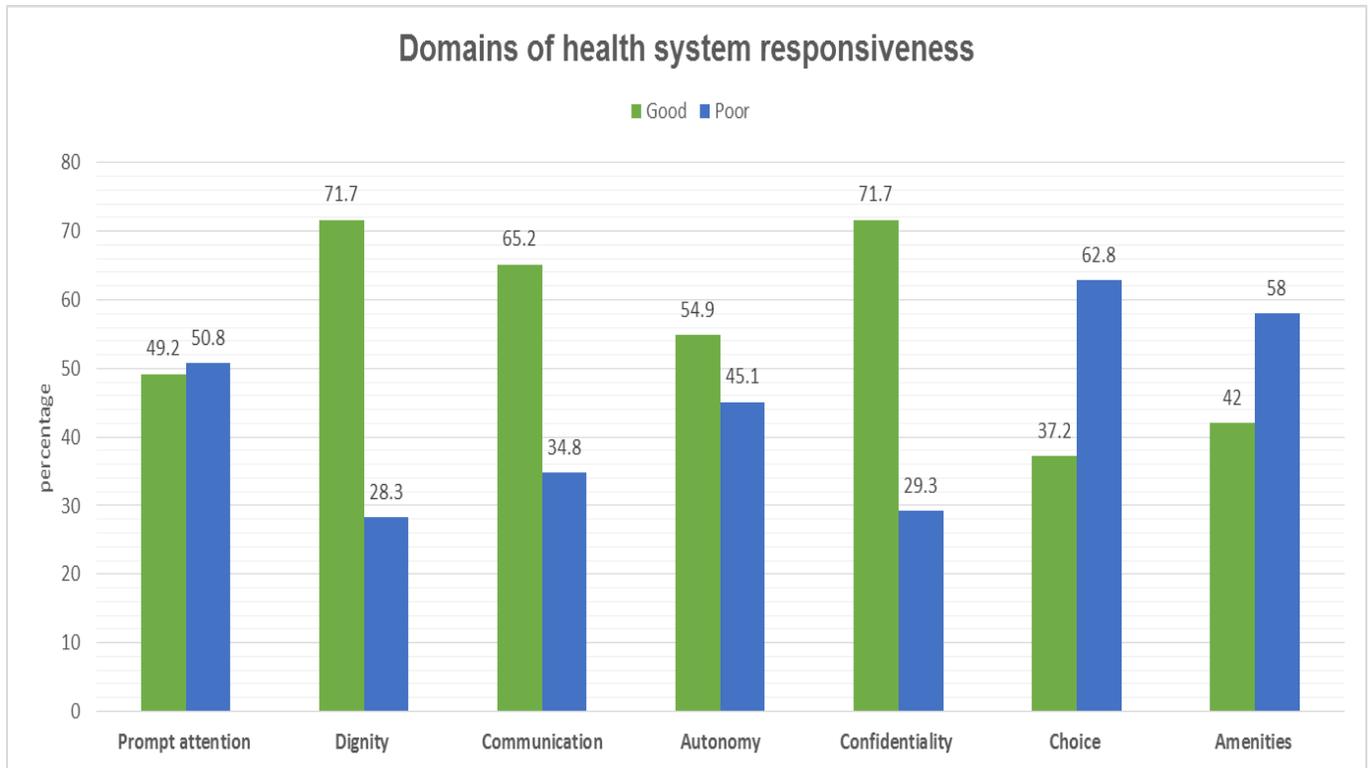
226 **Performance of health system responsiveness of respondents**

227 The performance of health system responsiveness was 66.2% (95% CI: 61.4% - 70.7%)

228 **Domains of health system responsiveness**

229 The domains of confidentiality and dignity were around 72% good performance. On the other
230 hand, Choice was the least (37.2%) score on the good category of performance (Fig. 2).

231



232 Figure 2: Health system responsiveness among outpatients who received health care services in
233 primary health care facilities, Asagirt District, North Shewa Zone, Ethiopia, 2021(n=417)

234 **Factors associated with health system responsiveness**

235 Binary logistic regression was employed to evaluate the association between different
236 sociodemographic, health facility related, and patient related variables with health system
237 responsiveness. Variables that were found with a p-value < 0.25 in bivariable logistic regression
238 such as age, occupation, educational status, type of facility, out of pocket payment for transport,
239 perceived satisfaction about health care, and perceived quality of health were found to be a
240 candidate for multivariable logistic regression. Model fitness was tested with Hosmer and
241 Lemeshow Goodness of Fit test (p = 0.52). In the final multivariable logistic regression analysis;

242 type of health facility, OOP payment for transport, and patient satisfaction were significantly
243 associated with HSR.

244 Health system responsiveness among private health care facility users were 8.8 times higher when
245 compared with those who utilized public health facility (AOR: 8.8, 95% CI, 4.32– 18.25).
246 Participants who had not paid out of pocket for transport to reach health facility were 1.7 times
247 higher health system responsiveness than their counterparts (AOR: 1.7, 95% CI, 1.03 – 2.92). The
248 likelihood of health system responsiveness among satisfied patients were nearly 10 times higher
249 when compared with patients having poor satisfaction (AOR: 9.9, 95% CI, 5.11-19.46) (Table 4)

250 **Discussions**

251 The study examined the health system responsiveness and associated factors among outpatients of
252 primary health care utilization at Asagirt District, North Shewa Zone, Ethiopia. The overall HSR
253 in the area was 66.2% (95% CI: 61.4%-70.7%). This finding is consistent with a study conducted
254 in Wolaita zone, Ethiopia 68.3% [28]. However, the result was higher than the Federal Ministry
255 of Health (FMOH) report (52.0 %) in service responsiveness normalized score [14]. The possible
256 explanation for this difference might be in the result from the Health Minister was only an average
257 report. Similarly, the result was higher than a study conducted in Shewarobit, Ethiopia (55.3%)
258 [37]. This could be differences in the study participants, in this study we investigated HSR among
259 all outpatients in the District from each primary health care facility in the District, however, in
260 Shewarobit the study was conducted on case-specific responsiveness among HIV positive
261 individuals. Additionally, the observed better responsiveness might be a result of the government's
262 ongoing efforts to improve service delivery. On the contrary, the finding was lower than a study
263 conducted in Brazil (80%) [11]. This is possibly due to the differences in health care availability
264 and accessibility where they are better than sub-Saharan Africa. Sociocultural and economic
265 disparities also the possible likelihood for these differences. Probably also the difference in study
266 population wherein Brazil it was conducted among older adults.

267 The performance of the responsiveness of health care utilization has differed across each domain.
268 The finding is supported by studies conducted in Iran, Brazil, and Ethiopia [11, 41, 42]. Of the
269 seven domains Confidentiality (71.7%) and Dignity (respect) (71.7%) were performed better. This
270 is in line with two studies conducted in Iran [41, 42]. Similarly, in Tanzania confidentiality (86.7%)
271 and dignity (81.4%) were the highest scores from the domain of responsiveness [23]. This might

272 be the users of health care services expect a high level of privacy and safeguard of their personal
273 information by health professionals [43].

274 From the finding of this research, choice (37%) was found to be the lowest good performance. The
275 finding of this study was in line with a study conducted in Iran which was (35.8%) [41]. However
276 slightly better than studies conducted in Brazil in which choice was scored as 24.4% [11]. The
277 possible explanation for this difference might be explained as the study period such that the study
278 conducted in Brazil was seven years back.

279 Despite the highest performance scores on confidentiality (71.7%), Dignity (71.7%),
280 communication (65.2%), our result revealed a concern by clients regarding; prompt attention
281 (waiting time) (49.2%), basic amenities (42%) and Choice (37%). These were similar to other
282 African countries of South Africa, Nigeria, and Tanzania [31-33] where prompt attention and
283 quality of basic amenities were poorly performed. Thus, the result indicated demand and supply
284 investments and the physical structure of the units proportional to the District population.

285 From the finding of this study, HSR did not significantly associated with the socio-demographic
286 backgrounds of the study participants. This is in line with two other case specific studies conducted
287 on HIV/AIDS in Ethiopia [23, 28]. Suggesting that HSR does not differ by socio-demographic
288 background. This might require further exploration. On the contrary, a study in Nigeria [43] found
289 that gender, educational status, and income were significantly associated with HSR. Similar to this
290 in Tanzania [32] older age, sex, and being married were associated negatively whereas, high
291 income and educational status were significantly associated with positive responsiveness.
292 Elsewhere studies in German [44], Thailand [24], and India [17] age was significantly associated
293 with health system responsiveness.

294 Health system responsiveness depends on financial aspects [45]. WHO suggested that travel time
295 was a major contributor to poor responsiveness [15]. Supporting to this idea our study showed that
296 the odds of HSR among participants with no out of pocket payment for transport to reach the health
297 facility was 1.7 times higher than its counterparts. This could probably because the rating of HSR
298 might be influenced by the expectations against relative total worth of expense in obtaining needed
299 health care. As improvement in financial fairness health facilities could rate more responsive [28]

300

301 From the finding of this study, it has clearly shown that the likelihood of HSR among participants
302 who were utilized private health facilities were nearly 9 times higher compared to public health
303 facility utilizers. Similar to this, findings from the African countries' of Ghana [46] and South
304 Africa [31] suggested that the overall responsiveness of public health services was lower compared
305 to private services. The possible reason for the highest responsiveness in private facilities might
306 be due to differences in good patient-physician interaction. Thus, private facilities have the aim to
307 maximize their profit to achieve this objective, they are more responsive to attract clients.

308 When clients were dissatisfied with health outcomes, responsiveness mean sum scores will become
309 low [6, 47]. In agreement with this idea, this study observed that clients who had good satisfaction
310 with the health care offered had higher HSR in relation to poorly satisfied individuals. Elsewhere
311 studies in Ghana, Ethiopia [28, 29, 37] also indicated that the more satisfaction the higher the
312 responsiveness. Additionally, the world health organization also suggested that except
313 confidentiality all the domains of health system responsiveness were positively and significantly
314 related to satisfaction [48]. Perhaps because as patients satisfied with a non-medical aspects of
315 care, associated with better compliance and understanding of all the interactions of results. To
316 achieve a higher level of welfare on non-health enhancing aspects of care, a greater health system
317 responsiveness is needed.

318 **Strength and Limitations**

319 There might not be recall bias since the data were collected immediately after they get health care
320 services on their way to home.

- 321• The data were collected only from the patient perspective or did not include the providers'
322 perspective
- 323• If the research was performed with a mixed approach, it could be better.
- 324• We also acknowledge the response bias because of the self-reported data to minimize it short and
325 interval questionnaires were employed.
- 326• Because of the cross-sectional nature causal relationships between satisfaction, facility type and
327 payment for transport with health system responsiveness cannot be established.

328 **Conclusion**

329 This study contributes to health system responsiveness research in Ethiopia among outpatients at
330 primary health care facilities. Even though relatively higher health system responsiveness than
331 case specific study in Ethiopia, the result showed that only confidentiality and dignity domains
332 found the highest score. Overall, HSR was higher in private than public healthcare facilities,
333 additionally satisfied clients and those who didn't pay for transport on their way to the health
334 facility were better responsive than their counterparts. The domain of Autonomy, Waiting time,
335 Basic amenities, Choice were identified as failed to meet the legitimate expectation of the clients
336 regarding the non-health aspects of medical care. They need effort to raise responsiveness of health
337 care service in the District. In addition to this, enhancing patient satisfaction, using input from
338 service users, sharing experience and working with collaboration from private clinics and giving
339 attention to distant coming patients will be important interventions to improve HSR.

340 **Abbreviations**

341 AOR: Adjusted Odds Ratio; CBHI: Community Based Health Insurance; CI: Confidence
342 Intervals; COR: Crude Odds Ratio; FMOH: Federal Ministry of Health; HIS: Health Insurance
343 Scheme; HSR: Health System Responsiveness; MCSS: Multi-Country Survey Study; NHIS:
344 National Health Insurance Scheme; OR: Odds Ratio; PHQ: Patient Health Quality; SHI: Social
345 Health Insurance; UHC: Universal Health Coverage; VIF: Variance Inflation Factor; WHO: World
346 Health Organization

347 **Declarations**

348 **Ethics approval and consent to participate**

349 Ethical clearance was obtained from the Institutional Review Board (IRB) of the University of
350 Gondar, College of Medicine and Health Sciences, Institute of Public Health (Ref. No:
351 IPH/1408/2013). Similarly, a support letter was obtained from the District Administration Health
352 Office to carry out data collection. After a brief explanation of the objectives and purpose of the
353 study, informed consent was obtained from each study participant. Participants were informed that
354 participation was voluntary and they have the right to stop their participation at any time. The
355 name of respondents were not be recorded on the questionnaires and confidentiality was assured

356 by using codes instead of any personal identifiers. The study was done according to Helsinki
357 declaration.

358 **Consent for publication**

359 Not applicable

360 **Availability of data and materials**

361 The data set is available on a reasonable request on the corresponding author.

362 **Competing interests**

363 The authors declare that they have no competing interests.

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365 The University of Gondar sponsored this study. However, it has no role in the decision to publish,
366 manuscript preparation, and publication.

367 **Authors' contributions**

368 All authors contributed to the preparation of the manuscript. WD conceived and designed the
369 research and performed the analysis then CTT, AA were advisors in the proposal and thesis
370 writing. WD, DB, and DZ prepared the draft manuscript, then CTT, AA, LY revised the final drafts
371 of the paper. All authors read and approved the final manuscript for publication.

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507

508 **List of tables**

509 Table 2: Health facility accessibility related characteristics of the study participants in Asagirt
510 District, primary health care facilities, North Shewa Zone, Ethiopia, 2021 (n=417)

Variables	Frequencies (n)	Percentage (%)
Time to reach the health facility on foot		
=< 1hour	234	56.1

>1 hour	183	43.9
Type of health facility		
Public	282	67.6
Private	135	32.4
Visited traditional healer		
Yes	185	44.4
No	232	55.6
OOP payment for transport*		
Yes	205	49.2
No	212	50.8

511 **Note:** *= out of pocket

512 Table 3: Patient related characteristics of the study participants in Asagirt District, primary health
513 care facilities, North Shewa Zone, Ethiopia, 2021 (n=417)

Variables	Frequency (n)	Percentage (%)
Perceived satisfaction		
Satisfied	339	81.3
Dissatisfied	78	18.7
Perceived health care		
High	338	81
Low	79	19
PHQ9*		
Good	353	84.6
Poor	64	15.4

514 **Note:** *= patient health quality

515 Table 4: Bivariable and multivariable analysis of potential factors associated with HSR of
516 outpatients in primary health care facilities, Asagirt District, North Shewa zone, Ethiopia,
517 2021(n=417)

Variables	Health system responsiveness		COR (95% CI)	AOR (95% CI)
	Unaccep table	Acceptable		
Age in years				
18-29	52	118	1	1
30-39	39	50	0.56 (0.33-0.96)	0.92 (0.47– 1.80)
40-49	19	35	0.81 (0.43-1.55)	1.00 (0.45-2.0)
50 and above	31	73	1.04 (0.61-1.77)	1.64 (0.82-3.29)
Occupational status				
Farmer	56	101	1	1
House wife	35	62	0.98(0.58-1.66)	0.98(0.51-1.87)
Employed	30	88	1.63(0.96-2.76)	1.03(0.46-2.32)
Merchant	20	25	0.69(0.35-1.36)	0.77(0.33-1.79)
Educational status				
Unable to read and write	25	45	1	1
Able to read and write	36	69	1.06 (0.57-2.00)	0.85 (0.39-1.82)
Primary (Grade 1-8)	58	77	0.74 (0.41-1.34)	0.51 (0.24-1.05)
High school and above	22	85	2.15 (1.09-4.22)	1.21 (0.44-3.31)
Type of health Facility				
Public	129	153	1	1
Private	12	123	8.64 (4.57-16.35)	8.88 (4.32-18.25)***
Out of pocket expense for transport				
Yes	85	120	1	1

No	56	156	1.97 (1.31-2.98)	1.74 (1.03-2.92)**
Patient health quality				
Good	113	240	1.65(0.96-2.84)	0.80(0.39-1.62)
Poor	28	36	1	1
Patient satisfaction				
Dissatisfied	61	17	1	1
Satisfied	80	259	11.62 (6.42-21.02)	9.98(5.11-19.46)***

518 Notes: * significant at $P < 0.05$ ** significant at $P < 0.01$ *** significant at $P < 0.001$

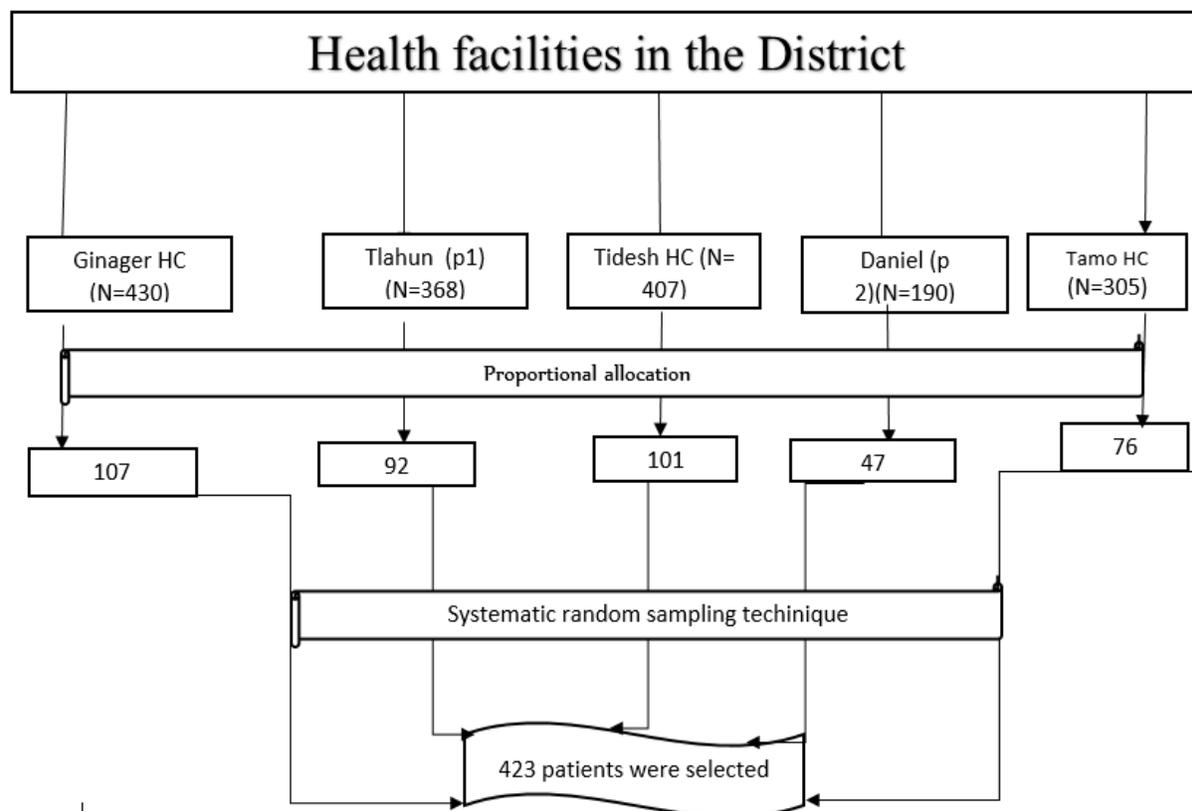
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521

Sampling procedure



522

523 Key: HC, health center: P1, Private clinic1: p2, private clinic2

524 Figure 1: Schematic presentation of the sampling procedure to select 423 outpatients from primary
525 health care facilities at Asagirt District, North Shewa Zone, Ethiopia, 2021.