

1 Contraceptive use among reproductive-age females with disabilities in central Sidama
2 National Regional State, Ethiopia: a multilevel analysis

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27 **Abstract**

28 **Background:** Contraceptive use is an important and cost-effective intervention to prevent
29 unwanted pregnancies. People with disabilities face discrimination when it comes to using
30 contraception, and are double burdened by unwanted pregnancies. However, the status of
31 contraceptive use and associated factors among reproductive-aged females with disabilities
32 was not determined adequately in Ethiopia.

33 **Objective:** This study aimed to assess contraceptive use and associated factors among
34 reproductive-age females with disabilities in Dale and Wonsho districts and Yirgalem city
35 administration of central Sidama National Regional State, Ethiopia.

36 **Methods:** A community-based cross-sectional study was conducted among randomly selected
37 620 reproductive-age females with disabilities living in the selected districts from June 20 to
38 July 15, 2022. The data were collected through face-to-face interviewing techniques using a
39 structured questionnaire. A multilevel logistic regression analysis model was employed to
40 analyze the data. The adjusted odds ratio (AOR) with a 95% confidence interval (CI) was used
41 to report the measures of associations.

42 **Results:** In this study, 27.3 % (95% CI: 23.8 %, 31.0 %) of the reproductive-age females with
43 disabilities were current contraceptive users. Regarding the methods, 82 (48.5%) of the
44 reproductive-age females with disabilities used implants. After adjusting for potential
45 confounding variables, having good knowledge about contraceptives (AOR=9.03; 95% CI:
46 4.39, 18.6), transport accessibility to health facilities (AOR=2.28; 95% CI: 1.32, 3.94), being
47 an adult (25 to 34 years old) (AOR=3.04; 95% CI: 1.53, 6.04), having a hearing disability
48 (AOR = 0.38; 95% CI: 0.18, 0.79), paralysis of the extremities (AOR = 0.06; 95% CI: 0.03,
49 0.12) and wheel-chaired disability (AOR = 0.10; 95% CI: 0.05, 0.22) were factors associated
50 with contraceptive use.

51 **Conclusion:** Contraceptive use among reproductive-age females with disabilities is low.
52 Transport accessibility, contraceptive knowledge, being in the age groups of 25 to 34 years and
53 the types of disability determine their contraceptive use. Therefore, designing appropriate
54 strategies to provide contraceptive education and information and arranging transportation
55 (ambulance) is important to enhance contraceptive use.

56 **Keywords:** Disability; Contraceptive; Use; Prevalence; Associated factors; Ethiopia,
57 Multilevel analysis

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59 **Introduction**

60 More than one billion people in the world are expected to have disabilities. The majority of
61 them are from developing countries (Zziwa Swaibu, Babikako Harriet et al. 2019). People with
62 disabilities are the most discriminated against and marginalized group in many countries,
63 particularly in developing countries, including Ethiopia (MacKay Don 2006, Hosseinpoor,
64 Stewart Williams et al. 2013).

65 Contraceptive methods are chemicals, drugs, and surgical procedures used to prevent unwanted
66 pregnancy (Jain and Muralidhar 2011). Although people with disabilities have a reproductive
67 right to access and use contraception, coverage of contraceptive use in developing countries,
68 including Ethiopia, is low when compared to developed countries. This is evidenced by the fact
69 that 70.1% (Haynes, Boulet et al. 2018) of disabled women in the United States of America,
70 67.4% (Aslan, Yilmaz et al. 2021) in Turkey, 34% (Olajide, Omisore et al. 2014) in Nigeria,
71 26.9% (Trani, Browne et al. 2011) in Sierra Leone, 26.1% (Ayiga and Kigozi 2016) in Uganda,
72 17% (Kumi-Kyereme 2021) in Ghana, 16% (Odhiambo 2012) in Kenya, and 18% (Beyene,
73 Munea et al. 2019) to 34% (Yesgat, Gebremeskel et al. 2020) in Ethiopia have access to
74 contraceptives.

75 In Ethiopia, various factors associated with contraceptive use among females with disabilities
76 were identified. Of the reported factors, marital status, age, types of disabilities, knowledge
77 and attitude towards family planning methods, the presence of nearby health facilities
78 providing family planning services, keeping confidentiality and privacy in the health facility,
79 having a good self-perception, and educational and economic status were the most common
80 (Tsegay, Gebremariam et al. 2017, Beyene, Munea et al. 2019, Yimer Awol Seid 2019,
81 Mekonnen Alemayehu Gonie, Bayleyegn Alebachew Demelash et al. 2020, Yesgat,
82 Gebremeskel et al. 2020).

83 In Ethiopia, few studies were conducted to determine the prevalence of contraceptive use and
84 associated factors among reproductive-age females with disabilities from 2013 to 2019
85 (Tsegay, Gebremariam et al. 2017, Beyene, Munea et al. 2019, Yimer Awol Seid 2019,
86 Mekonnen Alemayehu Gonic, Bayleyegn Alebachew Demelash et al. 2020, Yesgat,
87 Gebremeskel et al. 2020). These studies considered only urban female residents, deaf and blind
88 females, and females enrolled in supporting organizations and considered only individual-level
89 factors. Contraceptive coverage in these populations is also inconsistent, ranging from 18%
90 (Beyene, Munea et al. 2019) to 34% (Yesgat, Gebremeskel et al. 2020).

91 Therefore, this study aimed to determine the prevalence of contraceptive use and its associated
92 factors among reproductive-age females with disabilities by considering rural and urban
93 residency, all types of disability (except mental disability), and individual and community-level
94 factors.

95 **Methods and materials**

96 **Study design and setting**

97 A community-based cross-sectional study was conducted from June 20 to July 15, 2022, to
98 determine the prevalence and factors associated with contraceptive use among reproductive-
99 age females with disabilities in Sidama National Regional State, Ethiopia. The study was
100 conducted in the Dale and Wonsho districts and in the Yirgalem city administration. According
101 to the Sidama National Regional State Report (2021), the total population of Dale and Wonsho
102 districts and Yirgalem city administration was 469,455 (Sidama Region Health Bureau 2021,
103 Sidama Region Health Bureau 2022). The two districts are the health and demographic
104 surveillance sites of Hawassa University. Both districts are known for their coffee production
105 and highly dense populations. In the districts and city administration, there are 56 rural and 10
106 urban kebeles (the lowest political administrative units in Ethiopia). The districts and city
107 administration have one hospital, 16 health centers, and 54 health posts.

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110 **Population**

111 Reproductive-age females with disabilities in Dale and Wonsho districts, and Yirgalem city
112 administration in Sidama National Regional State were the source population. Reproductive-
113 age females with disabilities who lived in the selected kebeles for at least six months were the
114 study population except those who have dual disabilities (i.e. cannot see and hear) and are
115 seriously ill during the data collection time.

116 **Sample size and sampling procedure**

117 The sample size for the first objective (prevalence) was determined by using Epi Info version
118 7 software with the assumptions of a 95% confidence interval with 33.7% contraceptive use
119 among reproductive-age women with disability (Yibeltal Mesfin Yesgat, Feleke Gebremeskel
120 et al. 2020), a level of significance (α) of 0.05, a 5% margin of error ($d = 0.05$), and a design
121 effect of 1.64. The sample size for factors associated with contraceptive use was also computed
122 using Epi-Info version 7 with the assumptions of a two-sided confidence level of 95%, a power
123 of 80, a ratio of (unexposed: exposed), and a percent outcome in the unexposed group versus
124 percent outcome in the exposed group. Accordingly, the maximum (530) sample size was
125 determined by marital status (Beyene, Munea et al. 2019). The sample size from the prevalence
126 of 563 was larger than the associated factors' maximum sample size of 530. After adjusting for
127 an anticipated 10% nonresponse rate, the final sample size was 620.

128 The sample size was proportionally allocated to the 30 selected kebeles (20 rural and 10 urban)
129 based on the number of reproductive-age females with disabilities. Before conducting this
130 study, a house-to-house census was done to determine the number and identify reproductive-
131 age females with disabilities in each kebele. Reproductive-age females with disabilities were
132 registered during the census using the tracing form. The registration form was used to select
133 study participants using a simple random sampling technique.

134 **Variables**

135 The outcome variable was contraceptive use. Whereas, the independent variables were marital
136 status, age, types of disability, educational status, knowledge about family planning, income,
137 self-perception, attitude toward family planning, health care providers' attitudes, the presence
138 of family planning provision at a nearby health facility, and the keeping of confidentiality and
139 privacy by the health facility

Commented [SSKP1]: How the Kebeles were selected?
Probability or Non-probability sampling?

140 **Data collection procedures and quality assurance**

141 The questionnaires (data collection tools) were developed by reviewing different existing
142 literature, like EDHS 2016 (Central Statistical Agency (CSA) [Ethiopia] and ICF 2016,
143 Mekonnen Alemayehu Gonic, Bayleyegn Alebachew Demelash et al. 2020, Yesgat,
144 Gebremeskel et al. 2020), which consists of personal and socio-demographic characteristics
145 and contraceptive use-related issues. After developing and pretesting the data collection tool,
146 six data collectors and one supervisor who are fluent speakers of Sidamu Afoo and who have
147 data collection experience were employed. The data were collected through face-to-face
148 interviewing techniques using structured questionnaires. Two of the data collectors were
149 proficient in sign language and collected the data from reproductive-age females with hearing
150 disabilities. The interview was conducted in a place where confidentiality and privacy are
151 assured. To assure the quality of the data collection, a three-day data collector training was
152 given. The data collection tool was first prepared in English and then translated into Afoo-
153 Sidamu, a local language, and then back to English to check the consistency. The trained data
154 collectors did a pre-test on 31 (5%) reproductive-age females with disabilities in *Lokie kebele*
155 Hawassa city to check the tools, and corrections were made based on the feedback. The
156 principal investigator (PI) monitors and controls the overall process of data collection and
157 makes appropriate corrections for any issues raised during data collection. The PI also checked
158 the completeness of the questionnaires daily.

159 **Data management and analysis**

160 The Kobo Collect version 2021.3.4 application was used to collect the data. Following
161 collection, the data were imported into Stata version 16 for analysis using the "SSC install
162 kobo2stata" command. The cleaning and organizing of the data were done in Stata. The types
163 of variables were clarified, and the distribution was checked by running the frequency for
164 categorical data and mean \pm SD (standard deviation) for continuous variables. A multilevel
165 logistic regression analysis model was used to account for the kebele level. Before using the

166 multilevel logistic analysis model, we checked the intraclass correlation coefficient (ICC) level
167 with the chi-square significance level to determine whether using the multilevel logistic
168 analysis model is justifiable. The ICC=0.12 and its chi-square (P 0.001) significance level
169 showed that using a multilevel analysis model is reasonable. Then, bi-variable multilevel
170 logistic regression was done to identify eligible variables (P-value<0.20) for multivariable
171 multilevel logistic regression analysis. The multivariable multilevel logistic regression was
172 performed to check the presence of an association between level one or level two variables and
173 contraceptive use. To determine whether a significant association existed and its strength,
174 variables with adjusted odds ratios with a 95% confidence interval and P-value <0.05 were
175 considered.

176 **Ethical considerations**

177 The ethical clearance was gained from the Institutional Review Board at the College of
178 Medicine and Health Sciences of Hawassa University with approval number of Ref.No:
179 IRB/143/14. After approval, a support letter was written to Sidama National Regional Public
180 Health Institute. Then, obtaining the support letter from Sidama National Regional Public
181 Health Institute, the permission and cooperation letter was given to the woreda health offices.
182 Finally, the woreda health offices wrote a permission letter to selected kebeles to cooperate and
183 give consent to conduct the study. Written consent was gained from the study participants to
184 collect the data. There is no risk in participating in this survey. People with disabilities having
185 different health problems were linked to nearby health facilities for possible support and
186 follow-up.

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196 **Results**

197 **Socio-demographic characteristics of study participants**

198 A total of 620 reproductive-age females with disabilities were included in this study. The mean
199 (SD) age of the study participants was 28.12 (8.54) years. Of the study participants, 55.32% had
200 no formal education (illiterate) and almost all (98.90%) were not employed. Most (83.71%) of the
201 reproductive-age females with disabilities had no occupation, and 54.20% were married (Table 1).

202 **Contraceptive knowledge and attitude**

203 Among the study participants, 382 (61.6%) had good knowledge about contraceptives.
204 Regarding attitude, 303 (48.9%) of reproductive-age females with disabilities had a positive
205 attitude towards contraceptive use.

206 **Contraceptive use prevalence**

207 In this study, the overall prevalence of current contraceptive use among reproductive-age
208 females with disabilities was 27.3% (95% CI: 23.8, 31.0), of which 19.19% (95% CI: 16.17,
209 22.52) were from rural residents and 8.06 (95% CI: 6.04, 10.49) were from urban residents.
210 From the overall contraceptive use, 20.3% (95% CI: 17.2, 23.7) were married and 7% (95%
211 CI: .5.06, 9.22) were unmarried.

212 **Types of contraceptive methods used**

213 Of the contraceptive method users, 82 (48.5%) of the reproductive-age females with disabilities
214 used implants, followed by injectable (36%), oral contraceptive pills (12%), and intrauterine
215 contraceptive devices and condoms (4%).

216 **Reasons for not using contraceptives and their plan to use in the future**

217 This study tried to identify the possible reasons for not using contraceptives among the 451
218 non-users of the contraceptive reproductive age females with disabilities. Of the respondents,
219 the majority 161(36%) did not use it due to a lack of information about contraceptives (Figure
220 1). Regarding their future plan of contraceptive use, 147 (32.59%) had the plan to use, 209
221 (46.34%) had no plan to use, and 95 (21.06%) were not sure about their future plan.

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Commented [SSKP2]: Keep absolute numbers as well. It will add to the understanding of the reader

225 **Factors associated with contraceptive use**

226 **Random effect model**

227 In the zero model (model I), 12 % of the variability in contraceptive use was at the community
228 level (kebele level). This may be attributable to other unobserved community factors
229 (ICC=0.12), which were supported by the chi-square ($P<0.001$). This finding also showed that
230 using a multilevel analysis model is reasonable.

231 **Fixed effect model**

232 In the bivariable logistic regression, marital status, education, occupation, self-perception, age,
233 transport accessibility, contraceptive knowledge, types of disability, and residence were
234 significantly associated with contraceptive use, but in the multivariable multilevel logistic
235 regression analysis (after adjusting for the possible confounders), contraceptive knowledge,
236 transport accessibility to the health facility, age, and types of disability were significantly
237 associated with contraceptive use.

238 Reproductive-age females with a disability who knew about contraceptives had nine
239 (AOR=9.03; 95% CI: 4.39, 18.6) times higher odds of contraceptive use compared with those
240 who had no contraceptive knowledge. On the other hand, reproductive-age females with
241 disabilities who had transport accessibility to health facilities had two (AOR=2.28; 95% CI:
242 1.32, 3.94) times higher likelihood of contraceptive use compared with those who had no
243 transport accessibility. Regarding age, reproductive-age females with disabilities who were 25
244 to 34 years old had three (AOR=3.04; 95% CI: 1.53, 6.04) times higher odds of contraceptive
245 use compared with those who were in the age group of 15 to 24 years old. Participants with
246 hearing disabilities were 62% (AOR = 0.38; 95% CI: 0.18, 0.79), those with extremity paralysis
247 were 94% (AOR = 0.06; 95% CI: 0.03, 0.12), and those with wheel-chair disabilities were 90%
248 (AOR = 0.10; 95% CI: 0.05, 0.22) less likely to use contraceptives than their counterparts with
249 vision disabilities (Table 2).

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255 **Discussion**

256 The prevalence of contraceptive method use among reproductive-age females with disabilities
257 was 27.3%. In the multivariable multilevel logistic regression analysis, contraceptive
258 knowledge, transport accessibility to the health facility, being an adult (25 to 34 years old) and
259 types of disability were significantly associated with contraceptive use.

260 This study revealed that the contraceptive method use prevalence of 27.3% was almost similar
261 to the studies conducted in Uganda, 26.1% (Ayiga and Kigozi 2016), in Sierra Leon, 26.9%
262 (Trani, Browne et al. 2011) and in Ethiopia, 24.5% (Mekonnen Alemayehu Gonie, Bayleyegn
263 Alebachew Demelash et al. 2020) and 27.2% (Tsegay, Gebremariam et al. 2017). On the other
264 hand, the prevalence of contraceptive use in the current study is higher than in the previous
265 studies conducted in Kenya, 16% (Odhiambo 2012), Ghana, 17% (Kumi-Kyereme 2021), and
266 in Ethiopia 18% (Beyene, Munea et al. 2019). The possible reasons might be the long-time
267 interval between previous studies (2008) (Odhiambo 2012) and our study (2022), due to age
268 group differences in the study population, school young people in the previous study (Kumi-
269 Kyereme 2021) and reproductive-age females with disabilities in the current study, due to
270 information bias from the source of data, the information was collected from caregivers
271 (Odhiambo 2012). The other possible elucidation might be due to sample size differences.
272 However, the prevalence of contraceptive use is lower than the studies conducted in Namibia,
273 32.7% (Loeb and Grut 2005), Nigeria, 34% (Olajide, Omisore et al. 2014) and in Ethiopia 34%
274 (Yesgat, Gebremeskel et al. 2020). The possible justification might be that the Namibia study
275 (Loeb and Grut 2005) was conducted among married women with disabilities and the chance
276 of having unprotected sex increased among married people, and people with disabilities have
277 a higher desire to prevent pregnancy (Casebolt M Tara, Singh Kavita et al. 2022). The other
278 possible justification might be due to sample size and study population differences between the
279 studies conducted in Nigeria (215 in-school adolescents) (Olajide, Omisore et al. 2014) and the
280 current study (620 reproductive-age females with disabilities).

281 In this study, contraceptive knowledge is found to be significantly associated with
282 contraceptive use. Those participants who had contraceptive knowledge had a higher chance
283 of using contraceptives compared with those who had no contraceptive knowledge. The finding
284 is consistent with the studies conducted in Uganda (Ayiga and Kigozi 2016) and Nigeria
285 (Olajide, Omisore et al. 2014). The possible justification might be due to the power of

286 knowledge to create awareness and overcome some cultural and social constraints that may act
287 as a barrier to the use of contraceptives (Beyene, Muneza et al. 2019).

288 Those who had transport availability to the health facility had a greater chance of contraceptive
289 use when compared with those who had no transport accessibility to the health facility. As it is
290 known, most people with disabilities have a physical challenge (Olajide, Omisore et al. 2014)
291 in accessing health facilities, which indicates transportation is very important to accessing
292 health facilities and getting contraceptive methods. Being an adult (25 to 34 years old)
293 increased the chance of contraceptive use when compared with the age group of 15 to 24 years
294 old. The possible justification is that the chance of marriage and unprotected sexual intercourse
295 will increase among 25 to 34-year-old females with disabilities, and the chance of using
296 contraception will also increase due to the greater desire of people with disabilities to avoid
297 pregnancy (Casebolt M Tara, Singh Kavita et al. 2022). Compared with vision impairment, the
298 probability of using contraceptives by hearing-disability reproductive age females with
299 disabilities had 62% lower odds of contraceptive use, 94% lower odds of contraceptive use by
300 extremity paralysis disabilities, and 90% lower odds by wheel-chaired disabilities. This finding
301 is inconsistent with studies conducted in Gondar, Amhara region, Ethiopia and Addis Ababa
302 which revealed that the probability of contraceptive use increased among vision-impaired
303 females with disabilities when compared with other types of disabilities (Beyene, Muneza et al.
304 2019). The possible reason for the difference might be that visually impaired females with
305 disabilities had an increased chance of information access through different social media,
306 commonly radio. Radio is one of the most accessible and effective channels of information
307 transmission for people with disabilities in developing countries, including Ethiopia (Beyene,
308 Muneza et al. 2019).

309 These findings may be important for different stakeholders who are concerned about
310 reproductive-age females with disabilities and their reproductive health services, specifically
311 contraceptive use. This study was conducted among all types of reproductive-age females with
312 disabilities who reside in urban and rural areas. In the previous studies, rural residents with
313 disabilities were excluded from contraceptive use assessment studies. The other strength of this
314 study was the use of multilevel analysis to check the effect of kebele-level variables on
315 contraceptive use. However, due to the sensitivity and principles of contraceptive use, this
316 study did not consider reproductive-age females with mental disabilities. Therefore, this study
317 could be generalized to all reproductive-age females with disabilities except with mental
318 disabilities.

319 **Conclusion**

320 Contraceptive use among reproductive-age females with disabilities, specifically among the unmarried,
321 is noticeably low in Dale and Wonsho districts and Yirgalem city administration, Sidama National
322 Regional State, Ethiopia. Contraceptive knowledge, accessible transportation to the health facility,
323 being an adult (25 to 34 years old) and having specific types of disability were factors associated with
324 contraceptive use among reproductive-age females with disabilities. Therefore, designing appropriate
325 strategies to provide contraceptive education and information and arranging transportation (ambulance)
326 is important to enhance contraceptive use.

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331 undertake this research.

332 **Competing interest**

333 All the authors declared that there were no financial or personal competing interests.

334 **Authors' contributions**

335 ZT, AG, and TG designed and wrote the proposal. ZT analyses and writes the manuscript. AG
336 and TG commented on and edited the manuscript.

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339 **Data availability**

340 The manuscript (tables and graphs) and supplementary files contain all of the data.

341 **Disclaimer**

342 The view expressed in the submitted article is the author's own.

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