

RESEARCH

Open Access



Multilevel analysis on prevalence and associated factors of modern contraceptive uptake in Somaliland: based on The Somaliland Health and Demographic Survey 2020

Teshome Gensa Geta^{1,2*}, Saad Ahmed Abdiwali², Mustafa Mohamoud Farah², Dereje Zewdu Assefa³ and Temesgen Tantu Arusi⁴

Abstract

Introduction Contraception is the deliberate prevention of unwanted pregnancy through various contraceptive methods. Its uptake is low in Sub-Saharan African countries, particularly in east Africa. This might be linked to the high prevalence of unwanted pregnancies and the high fertility rate in the area. Although studies reporting the prevalence and associated factors of modern contraceptive uptake are available in other African countries, no study has been conducted in Somaliland. Therefore, the current study aimed to assess its prevalence and associated factors in Somaliland using Somaliland Health and Demographic Survey (SLHDS) data.

Methods and materials The study used Somaliland Demographic Health Survey (SLDHS) 2020 data. The survey was a national-level survey using a cross-sectional study design. A total of 3656 reproductive-age women were included in the current study. To determine independent predictors of modern contraceptive uptake, a multi-level multivariable logistic regression analysis was done. Random effect analysis, standard error (SE) and intra-cluster correlation (ICC) were computed.

Results The proportion of modern contraceptive uptake among reproductive age groups in Somaliland is 1%. Modern contraceptive uptake is significantly associated with the residence, educational level and wealth index of participants. Women from nomadic communities had lower odds (AOR: 0.25; 95% CI: 0.10, 0.66) of modern contraceptive uptake compared to those from urban areas. Being in the highest wealth quintiles (AOR: 17.22; 95% CI: 1.99, 155.92) and having a tertiary educational level (AOR: 2.11; 95% CI: 1.29, 9.11) had higher odds of using the modern contraceptive method compared to those with the lowest wealth quintiles and non-formal education, respectively.

Conclusion The prevalence of modern contraceptive uptake in Somaliland was very low. It is associated with the level of education, wealth index and residence of the women.

Keywords Modern contraceptive method, Associated factors, Prevalence, Reproductive age, Somaliland

*Correspondence:

Teshome Gensa Geta

teshgen2006@gmail.com

Full list of author information is available at the end of the article



© The Author(s) 2024. **Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated in a credit line to the data.

Introduction

Contraception is the deliberate prevention of unwanted pregnancy through various contraceptive methods. It can be a traditional and/or modern contraceptive method [1]. Traditional contraceptive methods include the Coitus Interruptus or withdrawal method, the lactational amenorrhea method and the rhythm method. The modern contraceptive methods include emergency contraceptive pills, oral contraceptive pills, injectables, intrauterine contraceptive devices (IUCD), condoms, diaphragm, spermicides and female sterilization (Tubal ligation) [2].

Globally, out of 1.9 billion women in the reproductive age group, around 874 million women use modern contraceptive methods. Women need to use a contraceptive method and get satisfied with modern contraception were 77% globally. Its prevalence was lowest in the sub-Saharan Africa region (56%) compared to other regions [3]. The East African countries were among the lowest rate of uptake recorded. The report from a multi-country analysis of DHS in East Africa showed a very low pooled prevalence (20.68%) [4].

According to Sustainable Development Goal 3 (SDG 3), it was planned to increase universal access to reproductive health services, including family planning [5] to ensure that every pregnancy is wanted and planned. Despite the plan, uptake of modern contraceptive methods is still low in sub-Saharan African countries and have a high fertility rate compared to other regions [6]. Somali in east Africa is the country with high fertility rate (6.9 children per women). The 2020 Somali Health and Demographic survey (SHDS) indicated that 7% of sexually active women using contraceptive method and among them only 1% were using modern contraceptives [7]. It is the lowest modern contraceptive uptake region report by world contraceptive use 2022 by the UN [8]. This low uptake of modern contraceptive methods contributed to the high prevalence of unwanted pregnancies and interns contributed to a high proportion of adverse pregnancy outcomes in African countries [9]. It has also negative impact on the socioeconomic well-being of the family, community and the nation at large [10].

There are many factors associated with not using the modern contraceptive method. It was indicated that community prohibition due to traditional and religious practice negatively affects the uptake of modern contraceptive methods [11, 12]. The study conducted in sub-Saharan countries showed socio-demographic factors including age, educational status, marital status, residence and wealth index were found to be associated with contraceptive uptake [13–15]. Evidence also shows that access to information and knowledge about modern contraceptive methods affects their uptake [16, 17].

Even though different studies conducted in Africa showed low uptake of modern contraceptive methods and their contributing factors, no study has been conducted on this subject in Somaliland. Hence, the current study aimed to assess the prevalence and determinant factors of modern contraceptive uptake using 2020 Somaliland Demographic and Health Survey data.

Methods and materials

Study area

The study was conducted in Somaliland, officially called the Republic of Somaliland. The country is an unrecognized de facto sovereign state in the horn of Africa. It has six geographical regions; Awdal, Marodijeh, Sahil, Togdheer, Sanaag and Sool. Its claimed territory has an area of 176,120 square kilometers with approximately 5.7 million residents as of 2021. Somaliland has several challenges regarding access to health care services, particularly in rural communities. However, the Essential Package of Health Services (EPHS), in line with the WHO building blocks of the health system, was developed by the Ministry of Health Development to improve the healthcare system at all levels. Health care services are delivered through five tiers: the community level, the primary health unit (PHU), the health center, the referral health center/district hospital, and regional hospitals [18].

Study design and study period

A study used data from Somaliland Demographic and Health Survey (SLDHS) which is conducted by national-level survey in 2019 to assess factors associated with uptake of modern contraceptive method.

Data

The Somaliland Demographic and Health Service (SLDHS) considered six geographic regions for strata and the residences (urban, rural and nomadic) during sampling. For urban and rural areas, Geographic Information System (GIS) software was used to select the enumeration area (EA). A total of 2,806 (1,869 in urban and 937 in rural) dwelling structures are formed for sampling frames. The selection of 35 Enumeration areas (EA) was done by probability proportional to the size of dwelling structures. Then, households were listed in 35 EAs and 10 primary sampling units (PSU) were selected from 35 EAs using a probability proportional sampling technique [19]. To construct a sampling frame for nomadic residents' temporary nomadic settlements (TNS) were used. The list of TNS was considered as a sampling frame with an estimated number of households in each TNS being the measure of size. A total of 1,448 TNS dwelling structure was identified and the selection of EAs was done in the same way for urban

and rural residents. The final sampling unit (households) was selected by systematic sampling techniques.

All ever married women aged 15–49 were eligible to be interviewed. Total of 6285 women were successfully interviewed. The current analysis concentrated on history of uptake of modern contraception and its associated factors. Therefore, including the subjects with outcome variable gives final sample of 3656 women. Data collection was conducted by trained interviewers using a structured interviewer-administered questionnaire via the CSPro Android platform [20]. Before survey data collection, training for supervisors and data collectors was given; and a pre-test was done. Data

collection was closely supervised by supervisors and GPS tracking of field operations.

Study variables

The dependent variable was the uptake of modern contraceptive methods which was dichotomized as those ever used and not used contraceptive methods. Independent variables were individual-level variables including; respondent's age, educational level, wealth quintiles, marital status, listening to the radio, watching television, owning a mobile phone, ever used internet, intention for contraceptive use, heard about family

Table 1 Socio-demographic characteristics of the study population, Somaliland, 2020

Variables	Category	Frequency (n)	Percentage (%)
Age group (years)	<= 20	256	7.0
	20–29	1316	36.0
	30–39	1343	36.7
	40–49	741	20.3
Residence	Nomadic	1301	35.6
	Rural	1180	32.1
	Urban	1175	32.2
Region	Sanaag	848	23.2
	Sool	738	20.2
	Togdheer	667	18.2
	Sahil	467	12.8
	Awdal	474	13.0
	Marodjeh	462	12.6
Educational attainment	No formal education	3040	83.2
	Primary education	451	12.3
	Secondary education	110	3.0
	Tertiary education	55	1.5
Marital status	Married and in union	3233	88.4
	Divorced	263	7.2
	Widowed	160	4.4
Wealth quintile	Lowest	1230	33.6
	Second	584	16.0
	Middle	431	11.8
	Fourth	606	16.6
	Highest	805	22.0
Listen to radio	At least once a week	146	4.0
	Less than once a week	45	1.2
	Not at all	3465	94.8
Watching Television	At least once a week	416	11.4
	Less than once a week	100	2.7
	Not at all	3140	85.9
Owns Mobile Telephone	Yes	2763	75.6
	No	893	24.4
Ever used internet	Yes	309	8.5
	No	3347	91.5

Table 2 Reproductive history of the study participants, Somaliland, 2020

Variables	Category	Frequency (n)	Percentage (%)
Intention for contraceptive use (n=2471)	Intended	226	9.1
	Not intended	2245	90.9
Heard about FP on radio (n=3622)	Yes	464	12.8
	No	3158	86.2
Heard about FP on TV (n=3622)	Yes	500	13.7
	No	3122	85.4
Heard about FP by mobile phone text message (n=3622)	Yes	272	7.5
	No	3350	92.5
Health professionals talked about FP (n=3622)	Yes	589	16.3
	No	3033	83.7

planning on the radio, heard about the family on TV, heard about family planning by text message, get information from health professionals and also community level variables including residence and region were included in the current study.

Data processing and analysis

The data was exported to STATA version 14.0 software for analysis. Descriptive statistics are computed by summary indices including mean, frequency and percentage. To assess the association of dependent variables with independent variables binary logistic regression analysis was done. Again, to determine independent predictors of modern contraceptive method multi-level multivariable logistic regression analysis was done to determine individual and community level factors in four models. Model I (null model) is without any explanatory variables, Model II contains individual-level factors, model III contains community-level variables and Model IV contains both individual-level and community-level factors. Random effect analysis, standard Error (SE) and intra-cluster correlation (ICC) were computed. The estimates were weighted to reflect the population. Finally, variables with adjusted odds ratios (AOR) of *p*-value less than 0.05 were declared as having significant associations.

Results

Socio-demographic background of the study participants

A total of 3656 women were included in the analysis of current study from SLDHS 2020 data. The age range of participant was 15 to 49 with mean (\pm SD), 31.19 (\pm 8.05). All the participants were Muslims and majority did not attend formal education, 3040 (83.2%) (Table 1).

Information on contraceptive method

Majority of participants, 2245(90.9%) had no intention to use contraceptive method. Regarding about information related to family planning, only 464 (12.8%) heard information from radio and 589 (16.3%) learned about family planning from health professionals (Table 2).

Modern contraceptive method uptake

The proportion of modern contraceptive uptake among reproductive age group in Somaliland is 1%. The remaining, 3618 (99.0%) women had no history of taking modern contraceptive method (Fig. 1).

Bivariate logistic regression analysis of factors associated with contraceptive uptake

Bivariate logistic regression showed women living in rural and nomadic residence had significant less odds of using modern contraceptive method compared to those living in urban community. Women from nomadic

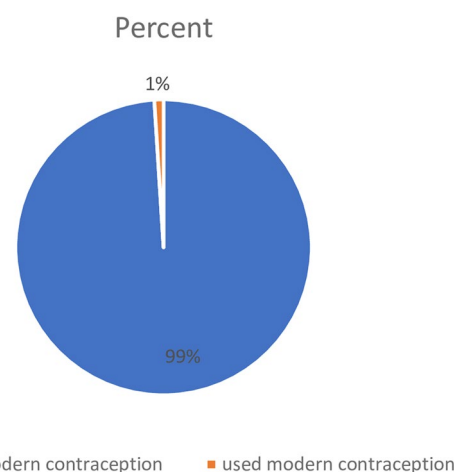


Fig. 1 Proportion of modern contraceptive uptake in Somaliland, data from Somaliland Demographic and Health Survey (SLDHS), 2020

village had 76% less odds of using modern contraceptive method compared to urban women (COR=0.23; 95% CI: 0.09, 0.57) (p -value=0.002). Regarding women's educational level, women with no formal education had 92% lesser odds of using modern contraceptive method compared to those attained tertiary level education (COR=0.08, 95% CI: 0.03, 0.24) (p -value < 0.001) (Table 3).

Factors associated with modern contraceptive method uptake

Multi-level multivariable logistic regression analysis was applied to determine individual and community-level determinants of modern contraceptive uptake. Four models were applied for analysis. According to random effect analysis, model I was a null model with no variable which only observed intercept. The ICC in this model was 12.8%, which indicates the presence of intra-cluster variability contributing to community-level variables. Hence, multi-level analysis was recommended. In multilevel analysis, educational attainment

is significantly associated with the uptake of modern contraceptive methods. The odds of using modern contraceptive method among women who reached secondary school was 3.71 times higher compared to those with no formal education (AOR=3.71; 95% CI 1.21 to 8.92). Women from nomadic residence had 75% lower odds of using modern contraceptive methods compared to women from urban residence (AOR=0.25; 95% CI 0.10, 0.66) (Table 4).

Discussion

A current study revealed that uptake of modern contraceptive methods is only 1%. This report is lower than studies conducted in Burundi (23.8%) [21], South East Ethiopia (20.8%) [22], Amhara Region, Ethiopia (46.9%) [23], Ghana (18%, 36.8%) [20, 24]. The possible explanation for this could be due to cultural and traditional practices that discourage the uptake of modern contraceptive methods. The study area has a deep-rooted perception that having a larger number of children is

Table 3 Bivariate logistic regression analysis of factors associated with contraceptive uptake in Somaliland, data from SLDHS 2020

Variables	Category	Crude Odds Ratio (95% CI)	P-value
Age group	<= 20	-	-
	20–29	2.25 (0.75– 6.77)	0.147
	30–39	2.48 (0.84, 7.38)	0.100
	>= 40	1 (ref)	
Residence	Urban	1 (ref)	
	Rural	0.38 (0.17, 0.84)	0.016*
	Nomadic	0.23 (0.09, 0.57)	0.002*
Level of education	No formal education	0.08 (0.03, 0.24)	< 0.001*
	Primary education	0.20 (0.05, 0.71)	0.031*
	Secondary education	1 (0.28, 3.48)	1.000
	Tertiary education	1 (ref)	
Wealth Index	Lowest	1(ref)	
	Second	5.30 (1.02, 27.41)	0.047*
	Middle	5.75 (1.05, 31.51)	0.044*
	Fourth	5.12 (0.98, 26.41)	0.052
	Highest	17.25 (4.04, 73.57)	< 0.001*
Heard FP by radio	Yes	1 (ref)	
	No	0.41 (0.19, 0.84)	0.015*
Heard FP by TV	Yes	1 (ref)	
	No	0.17 (0.09, 0.33)	< 0.001*
Heard FP from HP	Yes	1 (ref)	
	No	0.29 (0.15, 0.56)	< 0.001*
Read about FP from magazine	Yes	1 (ref)	
	No	0.14 (0.06, 0.35)	< 0.001*
Ever use internet	Yes	1 (ref)	
	No	0.13 (0.07, 0.26)	< 0.001*

HP Health professional, FP Family planning, CI Confidence interval, Ref Reference group

* Significant p -value

Table 4 Multi-level multivariable logistic regression models on individual and community-level factors associated with uptake of modern contraceptive methods in Somaliland based on data from SLDHS 2020

Variables and Category	Model I	Model II	Model III	Model IV
	Empty model	Individual level variables	Community level variables	Both individual and community level variables
		AOR (95% CI)	AOR (95% CI)	AOR (95% CI)
Education level				
No formal education		Ref		Ref
Primary school		1.07 (0.41, 2.84)		1.18 (0.44, 3.20)
Secondary school		3.71(1.21,11.30)*		3.72 (1.18, 11.66)*
Tertiary school		2.11 (1.12, 8.92)*		2.11 (1.20, 9.11)*
Wealth index				
Lower		Ref		Ref
Second		4.81 (0.91,25.36)		8.02 (1.41, 45.74)*
Middle		4.33 (0.75,24.79)		14.82 (1.51, 146.09)*
Fourth		3.01 (0.54,16.75)		10.02 (1.04, 96.08)*
Highest		5.67(1.11,28.95)*		17.22 (1.90, 155.92)*
Use internet				
Yes		Ref		Ref
No		0.56 (0.21, 1.47)		0.57 (0.27, 1.55)
FP HE by radio				
Yes		Ref		Ref
No		1.04(0.43, 2.52)		1.01 (0.42, 2.43)
FP HE By TV				
Yes		Ref		Ref
No		0.59 (0.24, 1.43)		0.65 (0.26, 1.63)
FP on Magazine				
Yes		Ref		Ref
No		0.61 (0.18, 2.03)		0.58 (0.17, 1.99)
FP HE from HP				
Yes		Ref		Ref
No		0.55 (0.24, 1.43)		0.54 (0.26, 1.11)
Residence				
Urban			Ref	Ref
Rural			0.36(0.16, 0.84)*	0.76 (0.31, 1.94)
Nomadic			0.25(0.10, 0.66)*	3.63 (0.63, 20.71)
Region				
Awdal			Ref	Ref
Marodijeh			1.43 (0.32, 6.28)	1.16 (0.25, 5.21)
Sahil			0.63 (0.15, 2.65)	0.65 (0.15, 2.87)
Togdher			0.24 (0.04, 1.15)	0.30 (0.05, 1.61)
Sool			0.56 (0.14, 2.10)	0.54 (0.13,2.27)
Sanaag			0.56 (0.15, 2.09)	0.54 (0.19, 2.11)
Random effect				
Community level	0.48 (0.34)	0.11 (0.19)	0.23 (0.29)	0.23 (0.29)
Variance (SE)				
ICC (%)	12.8%	3.1%	6.7%	6.5%

FP Family Planning, HE Health Education, ref Reference group, HP Health Professional, intra-cluster correlation, CI Confidence interval, AOR Adjusted odds ratio

* Significant *p*-value

as blessing from God and consider having a big family gives happy life [25]. Hence, most women do not want to use contraceptive method. The difference in report might also be explained by inadequate reproductive health services in the area compared to other studies [26] and differences in the socio-demographic characteristics of study participants.

The current study also examined individual and community-level factors associated with modern contraceptive uptake. It revealed that the educational level of women, wealth index and place of residence were found to be associated with contraceptive use. Women tertiary education had two times higher odds of using modern contraceptive methods compared to those with no formal education. This is in agreement with previous studies [27–32]. This might be due to the fact that educated women have more understanding of reproductive health and autonomous decision-making power in family planning compared to non-educated women. It can also be due to the fact that more educated women have a better understanding of reproductive health education and more access to reproductive health information than less educated women. Literacy also increases trust in scientific explanation of the use of contraceptive methods [29].

Women with the highest wealth index were 5.67 times more likely to utilize contraceptive methods compared to those with lowest wealth index. This report is in agreement with reports from other studies [13, 31, 33, 34]. It also in line with another study conducted in East Africa using multi-country demographic and healthy survey data [4]. This might be due to financial constraint that limits access to contraceptive methods. On the other hand, those women from the highest wealth quintiles might be more educated and have occupation that positively affects the uptake of contraception.

Regarding the residents of the participants, those women from nomadic and rural areas had lower odds of using modern contraceptive methods compared to those from urban areas. This report is supported by other studies conducted in Guinea [35], Southern Ethiopia [36], Northeast Ethiopia [37], Tanzania [38], Uganda [39] and other Sub-Saharan African countries [14]. This could be due to the fact that the quality and accessibility of reproductive health services are much lower in rural and nomadic areas compared to urban areas. In addition to this, cultural beliefs related with having large number of children and not using contraceptive methods are stricter in rural and nomadic communities. Poor access to reproductive health information in remote areas could have contributed to a lower uptake of contraceptive methods.

Strength and limitations of the study

The data used in the current study is a national demographic and health survey that is representative and generalizable to the whole population. The analysis was done using multilevel analysis that determined both individual and community-level factors. It is the first study in Somaliland; hence, the result is robust and would provide important information for policymakers. However, the study had some limitations. The survey was cross-sectional that might have had recall bias. Some important variables were not included in the analysis due to their missing in the SLDHS data set.

Conclusion

The prevalence of modern contraceptive uptake in Somaliland was very low (1%). The variables, including level of education, wealth index and residences, were found to be associated with it. Governmental and non-governmental organizations working on family planning should focus on promoting the education of women particularly among rural residents and economically weak members of the community.

Acknowledgements

We would like to thank Minster of Health Development, Somaliland for their cooperation to make data available for this study.

Authors' contributions

Authors, TGG and SAA made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work. Authors, MMF, DZA and TTA also made substantial contribution to data analysis, involved in drafting of article, revised it and gave final approval, agreed on journal choice for publication and will be accountable to all issues related with this paper.

Funding

The author(s) received no specific funding for this work.

Availability of data and materials

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

Declarations

Ethics approval and consent to participate

The study was based on SLHDS data which does not contain any identifying information. The formal letter was written to the responsible body to allow access to and ethical clearance to use SLHDS data. The data was fully anonymized and confidentiality was kept strictly. The written informed consent was obtained from the participants and guardians during survey. The ethical approval letter (Ref: MOHD/DG:2/630/2023) was written from Ministry of Health in Republic of Somaliland. Detailed information on the method and ethical issue during survey was indicated in the published 2020 Somaliland Demographic Health Survey (SLDHS) Report [19].

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹Department of Public Health, College of Medicine and Health Science, Wolkite University, Wolkite, Ethiopia. ²Department of Public Health, College of Health Science and Medicine, Gollis University, Hargeisa, Somaliland. ³Department of Anaesthesia, College of Health Science and Medicine, Wolkite University, Wolkite, Ethiopia. ⁴Department of Obstetrics and Gynaecology, College of Health Science and Medicine, Wolkite University, Wolkite, Ethiopia.

Received: 31 July 2023 Accepted: 3 April 2024

Published online: 21 May 2024

References

- Jain R, Muralidhar S. Contraceptive methods: needs, options and utilization. *J Obstet Gynecol India*. 2011;61(6):626–34.
- Gebremeskel F. Prevalence of modern contraceptive utilization and associated factors among women of reproductive age group at Boditi Town, Wolayita Zone, SNNPR, Ethiopia. *Am J Nurs Sci*. 2017;6(6):447.
- United Nations Department of Economics and Social Affairs. World family planning; meeting the changing needs for family planning: contraceptive use by age and method. 2022.
- Tessema ZT, Teshale AB, Tesema GA, Yeshaw Y, Worku MG. Pooled prevalence and determinants of modern contraceptive utilization in East Africa: a multi-country analysis of recent demographic and health surveys. *PLoS One*. 2021;16(3):e0247992. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0247992>. Cited 2023 May 24.
- United Nations department of Economic and Social Affairs. Tracking global progress on family planning. 2017.
- Wang W. International Health and Development, ICF International. 2012. How family planning supply and the service environment affect contraceptive ... - Google Books. Available from: https://books.google.so/books?hl=en&lr=&id=5TFCA6CM9A4C&oi=fnd&pg=PR5&dq=How+family+planning+and+service+environment+affect+contraceptive:+findings+from+East+African+countries+DHS+analysis&ots=0tRNja2foZ&sig=fj1m88KIOPblhKQ6y9sZrVeNM6c&redir_esc=y#v=onepage&q=How%20family%20planning%20and%20service%20environment%20affect%20contraceptive%3A%20findings%20from%20East%20African%20countries%20DHS%20analysis&f=false. Cited 2023 May 22.
- The Somali Health and Demographic Survey 2020 - Somalia | ReliefWeb. Available from: <https://reliefweb.int/report/somalia/somali-health-and-demographic-survey-2020>. Cited 2023 Jul 30.
- World Contraceptive Use | Population Division. Available from: <https://www.un.org/development/desa/pd/data/world-contraceptive-use>. Cited 2023 Jul 30.
- Yaya S, Ghose B. Prevalence of unmet need for contraception and its association with unwanted pregnancy among married women in Angola. *PLoS One*. 2018;13(12):e0209801. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0209801>. Cited 2023 May 24.
- Bongaarts J, Cleland JC, Townsend J, Bertrand JT, Gupta M Das. Family planning programs for the 21st century: rationale and design. *Reprod Health*. 2012. Available from: https://knowledgecommons.popcouncil.org/departments_sbsr-rh/1001. Cited 2023 May 24.
- Belete N, Zemene A, Hagos H, Yekoye A. Prevalence and factors associated with modern contraceptive discontinuation among reproductive age group women, a community based cross-sectional study in Humera town, northern Ethiopia. *BMC Womens Health*. 2018;18(1):1–8. Available from: <https://link.springer.com/articles/10.1186/s12905-018-0663-4>. Cited 2023 May 24.
- Bolarinwa OA, Tessema ZT, Frimpong JB, Seidu AA, Ahinkorah BO. Spatial distribution and factors associated with modern contraceptive use among women of reproductive age in Nigeria: a multilevel analysis. *PLoS One*. 2021;16(12):e0258844. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0258844>. Cited 2023 May 24.
- Apanga PA, Kumbeni MT, Ayamga EA, Ulanja MB, Akparibo R. Prevalence and factors associated with modern contraceptive use among women of reproductive age in 20 African countries: a large population-based study. *BMJ Open*. 2020;10(9):e041103. Available from: <https://bmjopen.bmj.com/content/10/9/e041103>. Cited 2023 May 24.
- Ahinkorah BO, Budu E, Aboagye RG, Agbaglo E, Arthur-Holmes F, Adu C, et al. Factors associated with modern contraceptive use among women with no fertility intention in sub-Saharan Africa: evidence from cross-sectional surveys of 29 countries. *Contracept Reprod Med*. 2021;6(1):1–13. Available from: <https://contraceptionmedicine.biomedcentral.com/articles/10.1186/s40834-021-00165-6>. Cited 2023 May 24.
- Sserwanja Q, Musaba MW, Mukunya D. Prevalence and factors associated with modern contraceptives utilization among female adolescents in Uganda. *BMC Womens Health*. 2021;21(1):1–7. Available from: <https://link.springer.com/articles/10.1186/s12905-021-01206-7>. Cited 2023 May 24.
- Tuyishime E. Factors associated with the prevalence of contraceptive use among women of reproductive age in Rwanda: a cross-sectional study using demographic and health survey Rwanda, 2010. 2016. Available from: <https://urn.kb.se/resolve?urn=urn:nbn:se:uu:diva-296474>. Cited 2023 May 24.
- Merera AM, Lelisho ME, Pandey D. Prevalence and determinants of contraceptive utilization among women in the reproductive age group in Ethiopia. *J Racial Ethn Health Disparities*. 2022;9(6):2340–50. Available from: <https://link.springer.com/article/10.1007/s40615-021-01171-9>. Cited 2023 May 24.
- Ministry of Health Development R of S. National Health Policy III. 2022.
- Somaliland/UNFPA Go. Somaliland Health and Demographic Survey (SLHDS). 2020.
- Abdulai M, Kenu E, Ameme DK, Bandoh DA, Tabong PT, Lartey AA, et al. Demographic and socio-cultural factors influencing contraceptive uptake among women of reproductive age in Tamale Metropolis, Northern Region, Ghana. *Ghana Med J*. 2020;54(2):64–72.
- Nkuzimana E, Babale MS, Ndoreroaho A, Nyandwi J. Uptake of modern contraceptive methods among Burundian women and associated factors: analysis of demographic and health survey data, Burundi 2016–2017. *East Afr Health Res J*. 2021;5(1):75–81.
- Belda SS, Haile MT, Melku AT, Tololu AK. Modern contraceptive utilization and associated factors among married pastoralist women in Bale eco-region, Bale Zone, South East Ethiopia. *BMC Health Serv Res*. 2017;17(1):194. <https://doi.org/10.1186/s12913-017-2115-5>.
- Mohammed A, Woldeyohannes D, Feleke A, Megabiaw B. Determinants of modern contraceptive utilization among married women of reproductive age group in North Shoa Zone, Amhara Region, Ethiopia. *Reprod Health*. 2014;11(1):13.
- Apanga PA, Adam MA. Factors influencing the uptake of family planning services in the Talensi District, Ghana. *Pan Afr Med J*. 2015;20:10.
- Royer PA, Olson LM, Jackson B, Weber LS, Gawron L, Sanders JN, et al. “In Africa, there was no family planning. Every year you just give birth”: family planning knowledge, attitudes, and practices among Somali and Congolese refugee women after resettlement to the United States. *Qual Health Res*. 2020;30(3):391. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7219277/>. Cited 2023 May 12.
- Maregn RT, Bourret K, Egal JA, Esse A, Mattison C, Klingberg-Allvin M. Qualitative study of the roles of midwives in the provision of sexual and reproductive healthcare services in the Somaliland health system. *BMJ Open*. 2023;13(3):e067315. Available from: <https://bmjopen.bmj.com/content/13/3/e067315>. Cited 2023 May 12.
- Zegeye B, Ahinkorah BO, Idriss-Wheeler D, Olorunsaiye CZ, Adjei NK, Yaya S. Modern contraceptive utilization and its associated factors among married women in Senegal: a multilevel analysis. *BMC Public Health*. 2021;21(1):231. <https://doi.org/10.1186/s12889-021-10252-7>.
- Mandiwa C, Namondwe B, Makwinja A, Zamawe C. Factors associated with contraceptive use among young women in Malawi: analysis of the 2015–16 Malawi demographic and health survey data. *Contracept Reprod Med*. 2018;3(1):1–8. Available from: <https://contraceptionmedicine.biomedcentral.com/articles/10.1186/s40834-018-0065-x>. Cited 2023 May 16.
- Hamdalla T, Arega A, Markos T. Prevalence and associated factors of modern contraceptive utilization among married women in reproductive age group in Misha Woreda Hadiya Zone, South Ethiopia. 2017.
- Lunani LL, Abaasa A, Omosa-Manyonyi G. Prevalence and factors associated with contraceptive use among Kenyan women aged 15–49 years.

- AIDS Behav. 2018;22(1):125–30. Available from: <https://link.springer.com/article/10.1007/s10461-018-2203-5>. Cited 2023 May 16.
31. Johnson OE. Determinants of modern contraceptive uptake among Nigerian women: evidence from the National Demographic and Health Survey. *Afr J Reprod Health*. 2017;21(3):89–95. Available from: <https://www.ajol.info/index.php/ajrh/article/view/163688>. Cited 2023 May 16.
 32. Abiye AA, Fekede B, Jemberie AM, Molla BA, Tolla BK, Tefera BS, et al. Modern contraceptive use and associated factors among reproductive age group women in three Peri-Urban communities in Central Ethiopia. *J Drug Deliv Ther*. 2019;9(6-s):93–102. Available from: <https://www.jddtonline.info/index.php/jddt/article/view/3651>. Cited 2023 May 16.
 33. Gebre MN, Edossa ZK. Modern contraceptive utilization and associated factors among reproductive-age women in Ethiopia: evidence from 2016 Ethiopia demographic and health survey. *BMC Womens Health*. 2020;20(1):1–14. Available from: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-020-00923-9>. Cited 2023 May 12.
 34. Ahinkorah BO, Seidu AA, Appiah F, Budu E, Adu C, Boahemaa Y, et al. Individual and community-level factors associated with modern contraceptive use among adolescent girls and young women in Mali: a mixed effects multilevel analysis of the 2018 Mali demographic and health survey. *Contracept Reprod Med*. 2020;5(1):1–12. Available from: <https://link.springer.com/articles/10.1186/s40834-020-00132-7>. Cited 2023 May 16.
 35. Sidibé S, Delamou A, Camara BS, Dioubaté N, Manet H, El Ayadi AM, et al. Trends in contraceptive use, unmet need and associated factors of modern contraceptive use among urban adolescents and young women in Guinea. *BMC Public Health*. 2020;20(1):1–10. Available from: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-020-09957-y>. Cited 2023 May 16.
 36. Endriyas M, Eshete A, Mekonnen E, Misganaw T, Shiferaw M, Ayele S. Contraceptive utilization and associated factors among women of reproductive age group in Southern Nations Nationalities and Peoples' Region, Ethiopia: cross-sectional survey, mixed-methods. *Contracept Reprod Med*. 2017;2(1):10.
 37. Alemayehu GA, Fekadu A, Yitayal M, Kebede Y, Abebe SM, Ayele TA, et al. Prevalence and determinants of contraceptive utilization among married women at Dabat Health and Demographic Surveillance System site, northwest Ethiopia. *BMC Womens Health*. 2018;18(1):1–7. Available from: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-018-0611-3>. Cited 2023 May 16.
 38. Mahande MJ, Shayo E, Amour C, Mshana G, Msuya S. Factors associated with modern contraceptives use among postpartum women in Bukombe district, Geita region, Tanzania. *PLoS One*. 2020;15(10):e0239903. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0239903>. Cited 2023 May 16.
 39. Asiiimwe JB, Ndugga P, Mushomi J, ManyenyeNtozi JP. Factors associated with modern contraceptive use among young and older women in Uganda; a comparative analysis. *BMC Public Health*. 2014;14(1):926.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.