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Effect of women's literacy status on maternal healthcare services utilization in Somaliland: a stratified analysis of the 2020 Somaliland Demographic and Health Survey

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Abstract

Background

Maternal mortality is a critical global health issue, particularly in low-income countries like Somaliland, where limited access to quality maternal healthcare persists. This study investigates how women's literacy status affects their use of institutional delivery, antenatal care, and postnatal care services in Somaliland.

Methods

This quantitative, cross-sectional study utilized secondary data from the 2020 Somaliland Demographic and Health Survey (SLDHS). A weighted sample of 2,512 women of reproductive age (15–49 years) was included. Dependent variables were Institutional Delivery, ANC Utilization (categorized by visit number), and PNC Utilization. The primary independent variable was Women's Literacy Status (Illiterate/Literate), with various sociodemographic factors as control variables. Multivariable binary logistic regression analyses were conducted, with results presented as Adjusted Odds Ratios (AORs) and 95% Confidence Intervals (CIs), with statistical significance set at $p < 0.05$.

Results

A significant majority (77.40%) of the women in the sample were illiterate. Literacy status demonstrated significant disparities in maternal healthcare utilization. For institutional delivery, literate women in regions like Sahil, Togdheer, and Sool showed significantly lower odds compared to Awdal. Wealth status strongly predicted institutional delivery and ANC utilization in both groups, with rich literate women having an AOR of 6.880 for institutional delivery and illiterate women in the rich category an AOR of 6.196. Crucially, more than four ANC visits dramatically increased the likelihood of institutional delivery (AOR = 11.00 for illiterate, AOR = 8.854 for literate). Regional disparities and wealth status also significantly influenced ANC and PNC utilization, with greater effects observed among illiterate women in some instances. For example, illiterate women in the rich wealth bracket were nearly seven times more likely to utilize ANC (AOR = 6.966).

Conclusion

The study highlights that women's literacy status significantly impacts the utilization of maternal healthcare services in Somaliland, influencing institutional delivery, ANC, and PNC. While socioeconomic factors play a crucial role for both literate and illiterate women, literacy appears to mitigate some regional disparities and amplify the impact of wealth on service uptake. Increased ANC visits are a strong predictor of institutional delivery.

Introduction

Maternal mortality remains a critical global health challenge, with over 700 women dying daily in 2023 from preventable causes related to pregnancy and childbirth, equating to a maternal death almost every two minutes. While the global maternal mortality ratio (MMR) saw a s40%, reduction between 2000 and 2023, significant disparities persist. In 2023, over 90% of all maternal deaths occurred in low- and lower-middle-income countries, with Sub-Saharan Africa and Southern Asia alone accounting for approximately 87% of these fatalities. This alarming statistic underscores the urgent need for improved access to quality maternal healthcare services, as care from skilled health professionals before, during, and after childbirth is crucial for saving the lives of both women and newborns[1][2]. Sub-Saharan Africa faces critically high maternal mortality, with 546 deaths per 100,000 live births, double the global average, and insufficient progress towards the SDG. The region also shows low maternal healthcare utilization, with only 55.5% for antenatal care, 77.0% for skilled birth attendance, and 41.2% for postnatal care.[3][4]. Maternal healthcare services utilization in middle-income countries varies significantly, with coverage at the antenatal stage ranging from 55% to over 80% in some nations. Intrapartum care coverage is often lower, around 65% to 70%, highlighting gaps in continuous care. Improving access and quality of services can increase utilization rates and reduce maternal mortality, which currently ranges from 120 to 200 deaths per 100,000 live births in these countries[5]. In developing countries of Southeast Asia, the utilization of maternal antenatal care (ANC) services is notably low; for instance, in Nepal, fewer than 3 out of 10 women received ANC on four or more occasions, and one out of four never received ANC at all [6].

These rates are significantly below the average for developing countries, china has achieved significant progress in maternal health, with a notable increase in the utilization of maternal health services over the past decades. For instance, the proportion of women receiving at least one antenatal care (ANC) visit rose from 69.7% in 1992 to 97.4% in 2020, while institutional delivery increased from 57.7% to 99.9% in the same period[7]. Maternal healthcare service utilization in Indonesia shows high rates for some services, with approximately 93.44% of mothers having adequate antenatal care and 83.73% delivering at a healthcare facility[8]. The utilization of maternal healthcare services in India, particularly in urban slums, faces significant challenges due to reported barriers and sociodemographic variations[9]. In Tanzania, the utilization of maternal healthcare services, specifically Antenatal Care (ANC), is vital, with evidence indicating that most pregnant women demonstrate a good ability to comprehend maternal health information[10][11]. Maternal health service utilization is lower among tribal communities in India, and the maternal mortality rate of 176 deaths per 100,000 live births in 2016 highlights the uneven progress across states and social groups. Despite policies and programs, only 19.1% of Indian women receive full antenatal care, indicating persistent challenges in maternal healthcare service utilization. [12]. [13]. [14][15]. Pakistan faces significant challenges in maternal healthcare, with a high maternal mortality rate of 154 per 100,000 live births in 2020, and rural areas experiencing a 26% higher rate than urban areas, indicating low utilization of service[16]. In Nepal, the utilization of maternal healthcare services is notably low, with only 29.2% of women reported to have used these services, despite government efforts to improve access[17].

Equitable access to maternal healthcare services and their optimal utilization remain significant challenges in Bangladesh, a country that currently experiences a high maternal mortality rate of 173 deaths per 100,000, with healthcare utilization levels below expected standards[18]. The overall prevalence of complete continuum of maternal healthcare services utilization in Ethiopia was found to be low, specifically at 25.51%[19][20]. Maternal healthcare service utilization, including antenatal care, postnatal care, and skilled attendants at birth, was relatively poor in the Democratic Republic of Congo (DRC) and showed disparities across geographical locations and socioeconomic statuses. For instance, the maternal mortality ratio in the DRC was estimated at 693 per 100,000 live births in 2015, making it one of the highest globally [21]. In Kenya, particularly in rural and coastal regions like Malindi Sub-County, only 35% of pregnant women access maternal care services at healthcare facilities, highlighting a significant challenge in healthcare utilization[22]. Recent evidence indicates that maternal healthcare services utilization, specifically Antenatal Care (ANC) coverage, in Nigeria remains suboptimal, with estimates showing only 57% coverage[23]. In Somaliland, lower literacy levels among women, as evidenced by the significant percentage of those with no formal education (14.9%) or only primary schooling (18.9%) utilizing antenatal care services, directly correlate with reduced access to maternal healthcare, underscoring the crucial role of education in improving health outcomes. Somaliland has one of the highest maternal mortality rates in the world, with only 31.1% of women initiating their first antenatal care visit within the first trimester. In Somaliland, only 41.10% of women with no education utilized Antenatal Care (ANC) services, whereas the utilization rate significantly increased with higher educational attainment, underscoring the critical role of women's literacy in improving maternal healthcare outcomes [24][25][26][27]

Novelty

The novelty of this study lies in its focused, stratified analysis of maternal healthcare service utilization based on women's literacy status within the specific context of Somaliland, using robust, nationally representative data from the 2020 Somaliland Demographic and Health Survey. While previous research has acknowledged the general link between education and maternal health, this paper uniquely disaggregates the impact of literacy on three distinct and critical maternal healthcare indicators—institutional delivery, antenatal care, and postnatal care—comparing responses between illiterate and literate women. This stratified approach reveals nuanced disparities and commonalities that might be obscured in aggregate analyses. For instance, it identifies how literacy can either mitigate or amplify the effects of other socioeconomic and demographic factors, such as regional access or wealth quintile, on service uptake. By providing granular insights into the unique barriers and facilitators faced by illiterate versus literate women in a high-maternal-mortality setting, the study offers targeted evidence for policy interventions, highlighting the critical, yet often underexplored, role of foundational literacy in shaping maternal health outcomes in one of the world's most vulnerable regions.

Methods

Study Design and Data Source

This study employed a quantitative, cross-sectional design, utilizing secondary data from the 2020 Somaliland Demographic and Health Survey (SLDHS). The SLDHS is a nationally representative survey that collects data on various health and demographic indicators, including maternal healthcare utilization, from women of reproductive age (15–49 years). The survey employs a multi-stage stratified cluster sampling approach to ensure representativeness, covering all six regions of Somaliland (Awdal, Marodijeh, Sahil, Togdheer, Sool, and Sanaag). The total sample size for this analysis included 2,512 women of reproductive age.

Measurement of Variables

The study's dependent variables comprised three distinct indicators of maternal healthcare service utilization: Institutional Delivery, defined as giving birth in a health facility with a skilled birth attendant; Antenatal Care (ANC) Utilization, measured by categorizing the number of ANC visits (Zero, One, Two-Four, Above four visits); and Postnatal Care (PNC) Utilization, indicating a health check-up from a skilled provider within six weeks postpartum. The main independent variable was Women's Literacy Status, categorized as "Illiterate" or "Literate" based on educational attainment and reading ability. Control variables, known to influence maternal healthcare, included the respondent's age, birth order, number of recent births, wealth quintile, family size, place of residence, Somaliland region, sex and age of household head, marital status, and sex of the child.

Study population and sampling procedure

The data for this study were drawn from the 2020 Somaliland Demographic and Health Survey (SLDHS), which employed a stratified two-stage cluster sampling methodology. In the initial stage, each of Somaliland's regions was stratified into distinct urban and rural areas. From these strata, 305 enumeration areas (EAs)—comprising 93 urban and 212 rural EAs—were selected. This selection was conducted with a probability proportional to the size of each EA (based on the number of households) and independently within each sampling stratum. A comprehensive household listing was subsequently carried out in all selected EAs between January and April 2019. The second stage involved the systematic selection of a fixed number of 30 households from each cluster, ensuring an equal probability of selection from the established household lists. The full SLDHS 2020 survey encompassed 2,512 households and 2,512 women of reproductive age (15–49 years). Eligibility for interview extended to all women aged 15–49 who were either permanent residents of the selected households or visitors who had stayed the night before the survey. For the purpose of this specific study, a weighted sample of 2,512 women who had given birth within the five years preceding the survey and whose literacy status was definitively assessed were included. Women whose literacy status was not determined were excluded from this analysis. The complete methodological procedure is meticulously detailed in the official SLDHS 2020 report.

Data Management and Analysis

Data management and analysis were performed using STATA V.16 software. To ensure the reliability and generalizability of statistical estimates, weighted data were utilized, which accounts for the complex sampling design, including the unequal probability of selection between strata and non-response rates among study participants. Descriptive statistics and summary measures were initially conducted to characterize the study population. Prior to multivariable analysis, multicollinearity among independent variables was assessed using variance inflation factors (VIFs); all variables included in the final models demonstrated VIF values less than 5, indicating no significant multicollinearity. Multivariable binary logistic regression analyses were employed for this study. Variables that showed a p-value of less than 0.25 in the bivariate analysis were considered as candidates for inclusion in the multivariable logistic regression models. The results of the multivariable analysis are presented as Adjusted Odds Ratios (AORs) with their corresponding 95% Confidence Intervals (CIs). Statistical significance for all analyses was set at a p-value of less than 0.05. A detailed explanation of the weighting procedure and further methodological intricacies can be found in the official SLDHS 2020 methodology report.

Results

Table 1 demonstrates. A significant majority of respondents are aged 24-34 (50.75%), with over 40% having had 1-3 births and a similar percentage having two births in the last five years. Poverty is prevalent, affecting 39.16% of households, and nearly half of families have more than five members (49.35%). Most of the population resides in rural areas (57.77%), and a striking 77.40% of women have no formal education, highlighting a critical barrier to healthcare access. The majority of household heads are young (74.87% are 29 or younger), and most women are married (92.02%). Regarding healthcare access, a concerning 63.04% of women reported zero Antenatal Care (ANC) visits, with only 8.5% having more than four visits. Male-headed households constitute 61.51% of the sample. Marodijeh and Togdheer are the most represented regions. This data collectively underscores the need for interventions addressing education, poverty, and rural access to improve maternal healthcare outcomes in Somaliland.

The table 2 shows multivariate analysis highlights several significant factors influencing institutional delivery among both illiterate and literate women. In the study area, women residing in the Sahil region exhibit a markedly lower likelihood of institutional delivery compared to those in Awdal, with the adjusted odds ratio (AOR) of 0.1907 (95% CI: 0.0597–0.6080) among literate women, indicating a statistically significant reduction ($p<0.01$). Similarly, women in the Togdheer and Sool regions have significantly decreased chances of institutional delivery, with AORs of 0.1348 (95% CI: 0.0452–0.4021) and 0.1767 (95% CI: 0.0591–0.5286), respectively, for literate women, both with p-values less than 0.001, underscoring regional disparities within the study area. The place of residence did not significantly influence institution-based delivery in either group, as indicated by AORs close to 1 with non-significant p-values. However, household sex of the head emerged as a significant factor among literate women, with female-headed households being nearly twice as likely to utilize institutional delivery services (AOR=1.877, 95% CI: 1.1099–3.174, $p<0.01$).

Socioeconomic status, measured via wealth quantiles, shows strong associations: among literate women, those in the middle wealth tertile had an AOR of 2.302 (95% CI: 0.8322–6.3681), while those in the rich category had an even higher likelihood with an AOR of 6.880 (95% CI: 3.1198–15.173), both statistically significant ($p<0.001$), indicating that wealth substantially increases the probability of institutional delivery. Reproductive history factors are also influential; women who had one or two births in the last five years showed increased odds of institutional delivery (AORs=1.582 and 1.5642 respectively), although significance was only evident for women with one birth ($p<0.05$). For women with three or more births, the odds decrease but do not reach significance. Antenatal care (ANC) visits play a critical role: women with more than four ANC visits are vastly more likely to deliver in a health facility (AOR=11.00 for illiterate and 8.854 for literate women, $p<0.001$), emphasizing the importance of ANC in promoting facility-based births. Overall, these results underscore the multifaceted nature of determinants affecting institutional delivery, with region, household sex, wealth status, and ANC utilization emerging as key factors influencing maternal health service uptake in the study area.

The table 3 indicates multivariable analysis of antenatal care (ANC) utilization reveals distinct disparities between illiterate and literate women of reproductive age across various factors. Among illiterate women, regional differences significantly influence ANC uptake. For example, women residing in Sool are substantially less likely to utilize ANC services, with an adjusted odds ratio (AOR) of 0.15587 (95% CI: 0.0916–0.2651, $p<0.001$), indicating an approximately 84% reduction in the likelihood compared to those in Awdal. Similar trends are observed in Marodijex (AOR=0.4335, CI: 0.2634–0.7136, $p<0.001$) and Sanaag (AOR=0.12287, CI: 0.0722–0.209, $p<0.001$). Conversely, in literate women, these regional disparities are less pronounced and often not statistically significant, notably in Sool (AOR=0.2381, CI: 0.0966–0.5867, $p=0.002$), suggesting that literacy may mitigate some regional inequalities. Urban residence among illiterate women is associated with higher ANC utilization (AOR=0.7978, CI: 0.5828–1.092, $p=0.159$), which is not statistically significant, while in literate women, urban residence significantly increases the likelihood (AOR=1.738, CI: 1.0462–2.890, $p=0.034$). Wealth status prominently impacts ANC use; illiterate women in the middle wealth bracket are over three times more likely to access ANC (AOR=3.960, CI: 2.492–6.291, $p<0.001$), and the wealthy are nearly seven times more likely (AOR=6.966, CI: 4.945–9.814, $p<0.001$). Similar but slightly attenuated effects are observed among literate women (middle wealth AOR=2.018, CI: 0.7424–5.485, $p=0.165$; rich AOR=3.029, CI: 1.414–6.486, $p=0.005$), emphasizing the importance of economic status regardless of literacy. Family size and birth order also influence ANC utilization variably: women with more than five family members have increased odds among illiterate women (AOR=1.217, CI: 0.9046–1.638, $p=0.219$) but decreased odds in literate women (AOR=0.7525, CI: 0.474–1.194, $p=0.221$). Notably, women who had three or more births in the last five years are significantly less likely to utilize ANC among literate women (AOR=0.3645, CI: 0.1492–0.8906, $p=0.027$), illustrating the impact of prior childbirth experience on ANC engagement.

Additionally, age and household composition influence ANC utilization distinctly across the groups. Among literate women aged 35–49, the likelihood of ANC use is significantly higher (AOR=3.289, CI: 1.389–7.790, $p=0.007$), whereas age differences among illiterate women are not significant. The sex of the child does not significantly affect ANC uptake in either group, indicating gender preferences may not

influence service use. Marital status appears to lack significant impact across both groups, with all confidence intervals including unity, although widowed women among literates tend to have higher odds (AOR=0.4838, CI: 0.041–5.707, p=0.535). Factors such as the number of ANC visits demonstrate strong predictive value; women with more than four visits are considerably more likely to utilize ANC services, with a near sevenfold increase among illiterate women (AOR=6.966, CI: 4.945–9.814, p<0.001) and over threefold among literate women (AOR=3.029, CI: 1.414–6.486, p=0.005). These findings underscore the complex interplay of socio-economic and demographic factors affecting ANC coverage and highlight the critical role of literacy, wealth, and regional contexts in maternal health service utilization.

The table 4 presents multivariable analysis of postnatal care utilization among illiterate and literate women reveals notable disparities influenced by regional, socioeconomic, and demographic factors. In the case of regional differences, women residing in Togdheer showed significantly lower odds of utilizing postnatal care compared to those in Awdal, with an adjusted odds ratio (AOR) of 0.5449 (95% CI: 0.3273-0.9069, p < 0.05) among illiterate women, indicating a statistically significant negative association. Similarly, women in Sool had considerably reduced odds (AOR = 0.2893, 95% CI: 0.1696-0.4932, p < 0.001), highlighting regional disparities. For literate women, the significance was less pronounced, with Togdheer showing an AOR of 0.4804 (95% CI: 0.2154-1.0712), which approaches significance but does not conclusively differ from Awdal. Wealth quintile emerged as a powerful predictor; illiterate women in the middle wealth group were over three times more likely to receive postnatal care than the poor (AOR = 3.694, 95% CI: 2.253-6.056, p < 0.001), and those in the rich category were over seven times more likely (AOR = 7.646, 95% CI: 5.360-10.90, p < 0.001). In contrast, among literate women, wealth status also had a significant effect, with rich women being four times more likely to access postnatal care compared to the poor (AOR = 4.029, 95% CI: 1.854-8.758, p < 0.01).

Demographic factors such as family size and birth order further distinguish postnatal care utilization. For illiterate women, those with more than five family members had significantly higher odds of attending postnatal services (AOR = 1.628, 95% CI: 1.023-2.590, p < 0.05), suggesting that larger families might motivate increased health service use. Conversely, birth order significantly affected utilization across literacy levels; women with four or more births had lower odds compared to those with three or fewer, with AORs of 0.5604 (95% CI: 0.3770-0.83297, p < 0.01) among illiterates and 0.6355 (95% CI: 0.3422-1.180, p > 0.05) among literates, indicating a significant deterrent effect primarily in the illiterate group. Notably, women's age appears influential among literate women; those aged 25-34 had higher odds (AOR = 1.763, 95% CI: 1.023-3.036, p < 0.05) of postnatal care utilization than the younger cohort (<24), whereas no significant age effect was observed among illiterate women. Overall, the statistical analysis underscores that literacy amplifies the impact of socioeconomic and demographic factors on postnatal care uptake, with significant odds ratios and p-values indicating robust associations within each subgroup.

Discussion

The health of mothers and their infants depends on maternal health literacy. We intend this study to examine effect of women's literacy status on maternal healthcare services utilization in Somaliland using a stratified analysis of the 2020 Somaliland Demographic and Health Survey. Our study findings revealed several significant factors influencing institutional delivery, antenatal care (ANC) utilization, and postnatal care (PNC) utilization, with distinct disparities observed between illiterate and literate women. 2,512 women were included in the analysis; their mean age was 31.13 years (SD ± 5.47), and 74.10% of them were between the ages of 20 and 34. Given that 77.40% of participants lacked literacy, a large educational barrier was apparent. The likelihood of an institutional birth was significantly lower for literate women in the Sahil region (AOR = 0.1907), and similar patterns were seen in Togdheer (AOR = 0.1348) and Sool (AOR = 0.1767). While illiterate women in the medium wealth bracket had an AOR of 3.694 for postnatal care (PNC) and women in Togdheer had reduced PNC access (AOR = 0.5449), wealthier illiterate women demonstrated a high correlation with ANC utilization (AOR = 6.966). This findings is consistent with what has been found in many previous studies. [28] [29][30]

The evidence showed that the institutional delivery a women with higher literacy rates were significantly more likely to utilize institutional deliver services. Our study findings aligns with a study carried out in Uganda which result confirmed for every additional year of schooling, the likelihood of utilizing maternal healthcare services increased by approximately 0.26 for antenatal visits and 0.11 for institutional deliveries[31] Another study highlighted pregnant women had a moderate or borderline level of health literacy, as indicated by their average score of 74.09. This implies that many women might find it difficult to comprehend and make appropriate use of health information [32] .Moreover study reported that the health literacy ANC 1, ANC 4, skilled birth attendance, and PNC service utilization were substantially greater among literate women than illiterate women ($p<0.001$) [20].e The outcome of this result is similar with study a research conducted in India Mumbai which showed regional difference Compared to just 12% of births in northern states for illiterate women, 67% of births in southern states to women with at least a middle school education took place in medical facilities [33]. Our findings reinforces with study in Ethiopia indicates that the percentage of Ethiopian women who use safe delivery is extremely low nationwide and in the Oromia region specifically, according to the 2011 and 2005 Ethiopian Demographic Health Surveys[34] This study found compared to women in the poor category, both literate and illiterate women in the middle and rich wealth groups were substantially more likely to give birth in an institution, the AOR for a literate women was 6.880 , while the AOR for rich illiterate women was 6.196 . This constantly demonstrates that the likelihood of facility-based births is greatly increased by more wealth. Similarly our study findings align with a cross-sectional study conducted in Ethiopia which shows that the rate of giving birth in an institution was 2.61 times higher for the wealthiest women than for the poorest (OR: 2.61; 95% CI: 1.95–3.50) [35]Moreover study conducted in Tanzania indicates that the Institutional delivery and the household wealth index were substantially correlated with these characteristics (aOR, 95% CI: 1.47 [1.09–2.27]) [36]. The findings discovered a significant correlation between ANC visits and institutional delivery. The likelihood of giving birth at a medical institution was significantly higher for women who had more than four ANC visits (AOR=11.00 for illiterate women and AOR=8.854 for literate women, both $p<0.001$). This findings in line with study carried out in Nigeria which

found the women attending ANC in skilled health facilities were 13.356 times more likely to have higher maternal health literacy [36] .Others have shown which was carried out in nine nations in Africa. Result indicates women who had four or more ANC visits were 2.98 (95% CI 2.77–3.22) times more likely to give birth in a health facility, whereas women who had three or less visits were twice (OR = 2.03; 95% CI 1.88–2.18) as likely to do so [37]. The results contribute to the existing literature conducted in Indonesia which revealed the moderate use of ANC services was indicated by the large percentage of individuals (about 76.8%) who did not attend the four ANC visits that were advised [38]. Furthermore a previous study showed in comparison to mothers who had only one (AOR=0.23[0.095, 0.556]), two (AOR=0.26[0.138, 0.307]), or three times (0.14{0.108, 0.167]) antenatal care contacts, mothers who had four or more prenatal care follow-ups showed adequate maternal health literacy . [39].

This study findings demonstrates that the chances of ANC use was nearly seven times higher for rich women (AOR=6.966,) and more than three times higher for illiterate women in the intermediate wealth band (AOR=3.960,). For literate women, the impacts were similar but somewhat diminished (rich AOR=3.029). Women who had three or more births in the last five years were significantly less likely to utilize ANC among literate women (AOR=0.3645, p=0.027).This findings supported by studies in Bangladesh which showed ANC use was more common among wealthier women (OR 1.485) and ANC use was less common among women with higher birth orders (OR 0.786) [40] Compared to the previous study revealed those without formal education were more likely to book during the first trimester (29%), attend at least four ANC visits (67%), receive adequate prenatal care (50%), give birth in a facility (87%) [11]. Our result outcome showed Women with more than five family members had *increased odds* of ANC utilization among illiterate women (AOR=1.217).Similarly Women in Nigeria reported moderate well-being indices (0.54 ± 0.2, 0.424 ± 0.2, respectively) and moderate usage of maternal health care services [41] Similarly study reported Pregnant mothers who had adequate health literacy were found to know more about antenatal care ($p < 0.05$) [42].Our study found that Postnatal care associate with wealth , region of illiterate women .Findings a ling directly study indicated that the postnatal care was linked to low community-level poverty (adjusted prevalence ratio: 0.43; 95% CI: 0.25, 0.73), living in an urban area (adjusted prevalence ratio: 3.52; 95% CI: 2.15, 5.78), experiencing health issues during the postpartum period (adjusted prevalence ratio: 1.79; 95% CI: 1.18, 2.72), and knowing about postnatal care (adjusted prevalence ratio: 1.11; 95% CI: 1.04, 1.19) 19. Stud align with our finding revealed that overall health literacy ($r=0.26$; $p<0.001$) and decision-making ($r=0.33$; $p<0.001$) [43]. In contrast another study discovered that women's postpartum adaptability to childbirth rose in tandem with their level of health literacy during this time [44].

Conclusion

This study uses data from the 2020 Somaliland Demographic and Health Survey to give a thorough analysis of the effect of women's literacy status on maternity healthcare service utilization in Somaliland. The results show significant variations between illiterate and literate women in terms of institutional delivery, antenatal care (ANC) use, and postnatal care (PNC) use, highlighting the complex nature of factors affecting the use of maternal health services. One important conclusion is that both literate and

illiterate women's chances of giving birth in an institution are strongly positively correlated with more ANC visits. The study emphasizes that although demographic and socioeconomic factors are important for both groups, literacy can have a big impact on how much access and use of critical maternal health care women have.

Recommendation

Based on the findings of this study, the following recommendations are put forth to improve maternal healthcare service utilization in Somaliland

- Promoting and funding adult literacy programs for women is crucial, as literacy significantly impacts healthcare service utilization. These programs should empower women with essential skills to comprehend health information and effectively navigate healthcare systems. Tailoring these initiatives to local contexts will enhance their effectiveness.
- Targeted Regional Interventions: The study shows that maternal healthcare consumption varies significantly by location. To overcome these disparities, region-specific measures are required, such as expanded healthcare facilities, mobile clinics, and community engagement initiatives.
- Promote Early and Consistent Antenatal Care (ANC): Health campaigns should emphasize the importance of early booking and consistent ANC attendance, especially for illiterate women and those with higher birth orders, who currently exhibit lower utilization rates. Community health workers can play a vital role in educating women and their families about the benefits of ANC.

Declarations

Ethics approval and consent to participate

The study was conducted in accordance with the Declaration of Helsinki. This research involves a secondary analysis of the 2020 Somaliland Demographic and Health Survey (SLDHS). The original survey was approved by the Institutional Review Board (IRB) of the Ministry of Planning and National Development and the Ministry of Health Development of Somaliland. Informed consent was obtained from all participants (and/or their legal guardians for those under 18) during the original survey. For the present study, the secondary dataset was de-identified and provided by the Central Statistics Department (CSD). Additionally, the specific research protocol for this analysis received formal ethical approval from the Institutional Review Board of Amoud University.

Consent for publication

Not applicable.

Availability of data and materials

The data that support the findings of this study were obtained from the Central Statistics Department (CSD) of the Somaliland Ministry of Planning and National Development. The datasets are not publicly

available due to institutional restrictions but are available from the corresponding author (ayaankorse@gmail.com) upon reasonable request and with the formal permission of the Somaliland Ministry of Planning.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

AHK and HMD conceptualized and designed the study. AHK performed the data management and statistical analysis. AHK, HMD, and FIM drafted the manuscript. SN provided technical supervision and critical revisions. All authors read and approved the final manuscript.

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Tables

Tables 1 to 4 are available in the supplementary files section

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