

Modeling Female Education Attendance in Somalia: A Comparative Logistic Regression Study Using SHDS 2020 Data.

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1.0 ABSTRACT

This study investigates the factors influencing girls' school attendance in Somalia, utilizing data from the Somali Health and Demographic Survey (SHDS) 2020. The dataset includes 18,527 responses, with only 16.21% of individuals reporting school attendance, highlighting significant barriers to education, particularly for girls. Geographically, Banadir reports the highest school attendance rate (22.15%), while regions such as Middle Shabelle (7.44%) and Bakool (8.95%) have significantly lower rates. Urban residents exhibit better access to education (17.29%) compared to rural (14.82%) and nomadic populations (16.09%). Age also plays a key role, with higher attendance among younger age groups, particularly those aged 15–19 (23.55%) and 20–24 (23.09%), while older groups show significantly lower attendance rates.

Socioeconomic factors, particularly wealth, demonstrate strong associations with school attendance. Individuals in the top wealth quintile have a 40.25% school attendance rate, compared to just 2.85% in the lowest quintile. Surprisingly, household energy access, the gender of the household head, and household size show no significant associations with school attendance.

Methods: the authors used Secondary data from (SDHS, 2020). The survey focused on women between the ages of 15 and 49. 18,527 out of 21,218 survey participants were analyzed. The application of logistic regression was then performed to determine if the predictors had an extensive association with female education attendance in Somalia

Findings: underscore the pressing need for targeted interventions to address regional, economic, and lifestyle disparities in education. Investments in infrastructure, policies promoting equitable access, and programs aimed at empowering girls in education are essential for overcoming these barriers and improving educational outcomes in Somalia.

Keywords: Female education, Somalia, logistic regression, socio-economic factors, educational access.

2.0. INTRODUCTION

Modeling female education attendance in Sub-Saharan Africa requires a comprehensive understanding of the multifaceted factors influencing educational attainment and participation. The literature indicates that several socio-economic, cultural, and health-related determinants significantly impact female education in the region. One of the primary barriers to female education in Sub-Saharan Africa is the socio-economic context. Many families prioritize male education over female education due to traditional gender roles and economic constraints. Shapiro and Tenikue highlight that women's schooling remains low, although it has been gradually increasing, which contributes to fertility decline and improved health outcomes for children (Shapiro, 2012; Shapiro & Tenikue, 2017). Furthermore, Mola discusses how socio-economic and sociocultural factors, including family dynamics and societal expectations, play a crucial role in shaping educational opportunities for girls (Mola, 2021). The intersection of poverty and gender inequality often results in girls being withdrawn from school to support household income or care for younger siblings, thereby perpetuating a cycle of low educational attainment and poverty (NGWAKWE COLLINS, 2020). The prevalence of adolescent pregnancies, often linked to low educational attainment, also contributes to high dropout rates among girls (Sedgh et al. 2015; Yakubu & Salisu, 2018). These health challenges not only diminish educational attendance but also affect the long-term socio-economic prospects of women in the region. The lack of supportive infrastructure, such as safe transportation and sanitary facilities, particularly in rural areas, further exacerbates the challenges faced by female students (Mola, 2021). Policies aimed at improving school environments and ensuring gender-sensitive educational practices are essential for fostering greater female attendance. Lastly,

political and institutional factors play a pivotal role in shaping educational policies and practices. The commitment of governments to gender parity in education, as well as the implementation of supportive policies, can significantly influence female educational outcomes. Kouladoum's research indicates that inclusive education policies enhance health and educational performance, suggesting that governmental support is crucial for improving female education (Kouladoum, 2023). In conclusion, modeling female education attendance in Sub-Saharan Africa necessitates a holistic approach that considers socio-economic, health-related, educational, and political factors. Addressing these interconnected challenges through targeted interventions and policies can significantly improve educational outcomes for women in the region.

3.0. METHODOLOGY AND DATA SOURCE

Methods and Data

This study made use of data from the 2020 Somali Demographic and Health Survey (SDHS), which turned into done via the Somali National Bureau of Statistics (SNBS) in partnership with the Ministry of Health of the Federal Government of Somalia. The SDHS applied a multi-stage stratified cluster sampling method. A 3-degree stratified cluster sampling technique was hired in both city and rural areas, at the same time as nomadic regions applied a two-stage layout. A comprehensive representation of the Somali population became accomplished through developing 47 sampling strata, after apart from regions like Lower Shabelle and Middle Juba with security concerns..

The SDHS was aimed toward girls between 15 and forty nine years old, in line with its emphasis on reproductive health and demographic elements. Out of the authentic 21,218 humans surveyed, facts cleaning tactics reduced the final number of participants to 18,527. 7,816 women from towns, 4,204 from geographical region, and 4,315 from nomadic regions were covered within the survey to make certain numerous illustrations across numerous residence kinds in Somalia.

The study focused on understanding factors influencing female college attendance, using a binary outcome variable indicating whether women had attended school (1) or not (0). Several predictor variables were examined across individual, household, and community levels. Individual-level factors included age groups (15-19, 20-24, 45-49) and gender, with a focus on family roles. Household-level factors included wealth quintiles, electricity access, and household size. Community-level factors considered regional differences and place of residence (urban, rural, or nomadic). Statistical analysis employed Pearson's Chi-square test to examine relationships between variables, and logistic regression to identify key predictors of school attendance, accounting for confounding factors and providing odds ratios to measure the strength of associations.

4.0. RESULTS

Table 1: Univariate Analysis

Variable	Category	Frequency	Percent	Cumulative Percent
Ever Attended School	Yes	3,003	16.21	16.21
	No	15,524	83.79	100.00
Total		18,527	100.00	
Region	Awdal	705	3.81	3.81
	Woqooyi Galbeed	1,206	6.51	10.31
	Togdheer	1,328	7.17	17.48
	Sool	1,467	7.92	25.40
	Sanaag	1,513	8.17	33.57
	Bari	747	4.03	37.60
	Nugaal	875	4.72	42.32
	Mudug	917	4.95	47.27
	Galgaduud	1,156	6.24	53.51
	Hiraan	1,235	6.67	60.18
	Middle Shabelle	981	5.29	65.47
	Banadir	2,650	14.30	79.78
	Bay	458	2.47	82.25
	Bakool	961	5.19	87.43
	Gedo	1,099	5.93	93.37
	Lower Juba	1,229	6.63	100.00
Total		18,527	100.00	
Type of Residence	Rural	4,846	26.16	26.16
	Urban	6,986	37.71	63.86
	Nomadic	6,695	36.14	100.00
Total		18,527	100.00	

Age in 5-Year Groups	15 - 19	760	4.10	4.10
	20 - 24	3,594	19.40	23.50
	25 - 29	5,475	29.55	53.05
	30 - 34	4,074	21.99	75.04
	35 - 39	3,140	16.95	91.99
	40 - 44	1,125	6.07	98.06
	45 - 49	359	1.94	100.00
Total		18,527	100.00	
Household Has Electricity	1	4,877	26.32	26.32
	2	13,650	73.68	100.00
Total		18,527	100.00	
Sex of Household Head	1	12,432	67.10	67.10
	2	6,095	32.90	100.00
Total		18,527	100.00	
Number of Household	0	8	0.04	0.04
	1	702	3.79	3.83
	2	1,395	7.53	11.36
	3	2,019	10.90	22.26
	4	2,715	14.65	36.91
	5	3,024	16.32	53.24
	6	2,891	15.60	68.84
	7	2,516	13.58	82.42
	8	1,855	10.01	92.43
	9	1,402	7.57	100.00
Total		18,527	100.00	
Wealth Quintile	Lowest	3,932	21.22	21.22
	Second	4,056	21.89	43.12
	Middle	3,724	20.10	63.22
	Fourth	3,727	20.12	83.33
	Highest	3,088	16.67	100.00
Total		18,527	100.00	
Sex of Child	Male	9,637	52.02	52.02
	Female	8,890	47.98	100.00
Total		18,527	100.00	

By making use of the Somali Health and Demographic Survey (SHDS) 2020 dataset, this examine investigates the different factors that affect the attendance of girls in training in Somalia. The dataset includes 18,527 responses, with simply sixteen.21% having attended faculty, while the tremendous majority (eighty three.79%) have not had formal education. This clean difference implies principal obstacles to education, specifically for women. The

examination indicates various geographical distribution, with Banadir having the largest population percent (14.30%), followed via regions along with Sanaag (eight.17%) and Woqooyi Galbeed (6.51%).

The research examines rural and urban trends, with 37.71% of people living in cities and a substantial 36.14% leading a nomadic lifestyle. The division between urban and rural areas significantly impacts education access, with urban residents having superior access to schools and educational facilities compared to rural and nomadic residents. Age is a crucial factor, with most people being in the 25-29 age group (29.55%), emphasizing the importance of education for socio-economic progress at this stage of life. Nevertheless, the data also shows a significant difference in the living conditions of households, as 73.68% do not have electricity, which could impact female education, especially in rural areas where access to basic necessities is crucial. Additionally, the gender of the household leader is a factor, with 67.10% of households being headed by males, potentially influencing decisions regarding female education.

Household size, with most households having 5 members (16.32%), can impact resource distribution for education, particularly for females in bigger households. The division of wealth into quintiles shows that 21.22% of the population is in the lowest quintile, while only 16.67% are in the highest, indicating unequal economic obstacles for female education. Finally, the dataset reveals a nearly even distribution of children's sexes, with 52.02% as male and 47.98% as female. This suggests that any differences in education participation between boys and girls are probably influenced more by sociocultural and economic reasons rather than demographic disparities.

Table 2: Bivariate Analysis

Characteristics	Ever Attended School		Chi-Square	Df	P value
	Frequency %)				
Region	YES	NO			
Awdal	116 (16.45%)	589 (83.55%)	231.9410	15	0.000
Woqooyi Galbeed	196 (16.25%)	1,010 (83.75%)			
Togdheer	206 (15.51%)	1,122 (84.49%)			
Sool	236 (16.09%)	1,231 (83.91%)			
Sanaag	263 (17.38%)	1,250 (82.62%)			
Bari	127 (17.00%)	620 (83.00%)			
Nugaal	164 (18.74%)	711 (81.26%)			
Mudug	208 (22.68%)	709 (77.32%)			
Galgaduud	154 (13.32%)	1,002 (86.68%)			
Hiraan	138 (11.17%)	1,097 (88.83%)			
Middle Shabelle	73 (7.44%)	908 (92.56%)			
Banadir	587 (22.15%)	2,063 (77.85%)			
Bay	81 (17.69%)	377 (82.31%)			
Bakool	86 (8.95%)	875 (91.05%)			
Gedo	192 (17.47%)	907 (82.53%)			
Lower Juba	176 (14.32%)	1,053 (85.68%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Type of Residence			13.0241	2	0.001
Rural	718 (14.82%)	4,128 (85.18%)			
Urban	1,208 (17.29%)	5,778 (82.71%)			
Nomadic	1,077 (16.09%)	5,618 (83.91%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Age in 5-Year Groups			403.2634	6	0.000
15 - 19	179 (23.55%)	581 (76.45%)			
20 - 24	830 (23.09%)	2,764 (76.91%)			
25 - 29	1,000 (18.26%)	4,475 (81.74%)			
30 - 34	618 (15.17%)	3,456 (84.83%)			
35 - 39	279 (8.89%)	2,861 (91.11%)			
40 - 44	80 (7.11%)	1,045 (92.89%)			
45 - 49	17 (4.74%)	342 (95.26%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Household Has Electricity			1.5494	1	0.213
1	818 (16.77%)	4,059 (83.23%)			
2	2,185 (16.01%)	11,465 (83.99%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Sex of Household Head			0.0000	1	0.997
1	2,015 (16.21%)	10,417 (83.79%)			
2	988 (16.21%)	5,107 (83.79%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Number of Household Members			13.3881	9	0.146
0	0 (0.00%)	8 (100.00%)			
1	113 (16.10%)	589 (83.90%)			
2	240 (17.20%)	1,155 (82.80%)			
3	306 (15.16%)	1,713 (84.84%)			

4	437 (16.10%)	2,278 (83.90%)			
5	475 (15.71%)	2,549 (84.29%)			
6	442 (15.29%)	2,449 (84.71%)			
7	416 (16.53%)	2,100 (83.47%)			
8	313 (16.87%)	1,542 (83.13%)			
9	261 (18.62%)	1,141 (81.38%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Wealth Quintile			2,300.0	4	0.000
Lowest	112 (2.85%)	3,820 (97.15%)			
Second	269 (6.63%)	3,787 (93.37%)			
Middle	500 (13.43%)	3,224 (86.57%)			
Fourth	879 (23.58%)	2,848 (76.42%)			
Highest	1,243 (40.25%)	1,845 (59.75%)			
Total	3,003 (16.21%)	15,524 (83.79%)			
Sex of Child			0.1913	1	0.662
Male	1,573 (16.32%)	8,064 (83.68%)			
Female	1,430 (16.09%)	7,460 (83.91%)			
Total	3,003 (16.21%)	15,524 (83.79%)			

Using data from the Somali Health and Demographic Survey (SHDS) 2020, a study was conducted to investigate how different demographic and socioeconomic factors relate to school attendance in Somalia, utilizing Chi-Square tests to determine statistical significance. Regarding regional distribution, there are significant variations in education attendance (Chi-Square = 231.9410, df = 15, $P < 0.001$). As an example, Banadir displays the highest attendance rate at 22.15%, whereas Middle Shabelle (7.44%) and Bakool (8.95%) have significantly lower rates of attendance. Out of the individuals surveyed, 16.21% have received schooling, with the remaining 83.79% having not, pointing to the widespread obstacles in accessing education nationwide.

The form of housing has a remarkable impact too (Chi-Square = 13.0241, df = 2, $P = \text{zero.001}$), wherein city dwellers have the maximum attendance at 17.29%, at the same time as rural regions have 14.82% and nomadic businesses have sixteen.09%. Another crucial thing is age (Chi-Square = 403.2634, df = 6, $P < 0.001$), as younger humans within the 15-19 and 20-24 age brackets show better attendance rates (23.55% and 23.09%, in that order). On the opposite hand, there is a extensive lower in college attendance among older age groups, specifically amongst individuals elderly forty five-forty nine, with only four.74% having attended school.

Surprisingly, there are not any statistically tremendous connections among school attendance and family energy get right of entry to (Chi-Square = 1.5494, df = 1, $P = \text{zero.213}$) or the gender of the family head (Chi-Square = zero.0000, df = 1, $P = \text{zero.997}$). Household length

additionally has little impact (Chi-Square = 13.3881, df = nine, P = zero.146) as attendance fees range slightly from 15.Sixteen% to 18.Sixty two% amongst numerous family sizes.

Riches play a critical role (Chi-Square = 2,300.0, df = 4, P < zero.001). Individuals within the pinnacle 20% of wealth have a school attendance price of forty.25%, whilst those inside the bottom 20% have a college attendance rate of only 2.Eighty five%, showing that financial barriers play a massive function in figuring out get entry to to training. There is not any widespread difference in attendance fees between male (16.32%) and lady (16.09%) college students, as indicated by the child's sex (Chi-Square = zero.1913, df = 1, P = 0.662). This take a look at highlights how important factors like location, form of house, age, and wealth are for school attendance in Somalia, while variables which includes household strength, household head's gender, and child's gender seem to have less of an impact.

Table 3: Multivariate Logistic Regression

V106A	Odds	Ratio	Std.Err.	z	P>z	95%Conf	Interval
Region							
Woqooyi	1.458	0.219	2.510	0.012	1.086	1.958	
Galbeed							
Togdheer	0.897	0.134	-0.730	0.466	0.670	1.201	
Sool	0.792	0.116	-1.600	0.110	0.595	1.054	
Sanaag	1.179	0.169	1.140	0.253	0.889	1.562	
Bari	1.315	0.213	1.690	0.090	0.958	1.806	
Nugaal	1.436	0.221	2.350	0.019	1.062	1.941	
Mudug	0.974	0.147	-0.170	0.862	0.725	1.309	
Galgaduud	1.718	0.266	3.490	0.000	1.268	2.328	
Hiraan	1.546	0.243	2.770	0.006	1.136	2.104	
Middle Shabelle	2.591	0.509	4.850	0.000	1.763	3.807	
Banadir	1.427	0.283	1.790	0.073	0.968	2.104	
Bay	0.930	0.217	-0.310	0.756	0.589	1.468	
Bakool	0.963	0.217	-0.170	0.865	0.619	1.496	
Gedo	0.430	0.088	-4.110	0.000	0.288	0.643	
Lower Juba	1.096	0.200	0.500	0.615	0.767	1.567	
Type of Residence							
Urban	0.683	0.049	-5.330	0.000	0.594	0.786	
Nomadic	1.175	0.163	1.160	0.246	0.895	1.542	
Age in 5-Year Groups							
20 - 24	1.180	0.124	1.580	0.114	0.961	1.449	
25 - 29	1.688	0.173	5.100	0.000	1.381	2.065	
30 - 34	2.360	0.252	8.060	0.000	1.915	2.909	
35 - 39	3.992	0.464	11.910	0.000	3.179	5.014	
40 - 44	4.465	0.689	9.690	0.000	3.300	6.043	
45 - 49	8.407	2.307	7.760	0.000	4.910	14.397	
2.V119	0.827	0.055	-2.870	0.004	0.727	0.942	
2.V151	0.952	0.046	-1.030	0.304	0.866	1.046	

Number of Household						
0		1		(empty)		
1	1.087	0.149	0.610	0.542	0.831	1.423
2	1.077	0.119	0.670	0.505	0.867	1.337
3	1.219	0.126	1.910	0.056	0.995	1.492
4	1.128	0.109	1.250	0.213	0.933	1.363
5	1.172	0.111	1.680	0.092	0.974	1.411
6	1.217	0.116	2.060	0.039	1.010	1.466
7	1.080	0.105	0.800	0.426	0.893	1.306
8	1.161	0.119	1.460	0.145	0.950	1.418
9		1		(omitted)		
Wealth Quintile						
Second	0.374	0.044	-8.390	0.000	0.297	0.471
Middle	0.150	0.017	-17.180	0.000	0.121	0.186
Fourth	0.071	0.008	-24.700	0.000	0.057	0.087
Highest	0.031	0.003	-32.240	0.000	0.025	0.039
Sex of Child						
Female	0.993	0.044	-0.160	0.872	0.911	1.082
_cons	21.250	4.299	15.110	0.000	14.294	31.591

Analysis of the percentages ratio offers knowledge into the variables impacting faculty attendance chances in numerous areas of Somalia. Woqooyi Galbeed, Nugaal, Galgaduud, Hiraan, and Middle Shabelle have a whole lot more possibilities of college attendance as compared to other regions. Gedo's attendance odds are appreciably lower with a poor association (OR = 0.430, $p = 0.000$). Living in urban regions is linked to a reduced chance of attending, with a odds ratio of zero.683 and a p-cost of zero.000, whereas residing a nomadic life-style does no longer have an extraordinary impact. Individuals among the long time of 25 and 49 are more likely to wait, with the ones aged 45 to forty nine having the very best odds (OR = eight.407, $p = 0.000$). There is a sturdy connection between wealth and faculty attendance, as the wealthiest quintile has the lowest risk of now not attending faculty (OR = 0.031, $p = 0.000$). Gender has no sizeable effect on attendance at school (OR = 0.993, $p = 0.872$). In fashionable, school attendance opportunity is significantly laid low with a variety of regional, residential, age, and wealth aspects.

5.0. DISCUSSION

The findings from this comparative logistic regression study on female education attendance in Somalia highlight several key factors influencing educational participation, aligning with existing literature on the broader Sub-Saharan African context. The stark statistic that only 16.21% of the surveyed population has ever attended school underscores the significant barriers to education, particularly for females. This disparity is particularly pronounced when considering socio-economic and cultural factors that shape educational opportunities.

The analysis reaffirms the critical role of socio-economic conditions in determining educational access. As noted in the literature, traditional gender roles often lead families to prioritize male education over female education, especially in economically constrained households. The results indicate a strong correlation between wealth and school attendance, with individuals in the lowest wealth quintile exhibiting an alarmingly low attendance rate of 2.85%. This finding echoes Mola's assertions about the intersection of poverty and gender inequality, reinforcing the need for targeted interventions that address these economic barriers.

The geographic distribution of educational attendance reveals significant regional disparities, with Banadir showing the highest attendance rates while regions like Middle Shabelle and Bakool lag significantly behind. These findings align with the notion that urban areas, which typically have better access to educational infrastructure, offer more opportunities for schooling compared to rural or nomadic settings. This urban-rural divide is crucial; as the data suggests, urban residents exhibit higher attendance rates (17.29%) compared to their rural (14.82%) and nomadic (16.09%) counterparts. This disparity highlights the need for policies that enhance educational infrastructure in underserved areas.

Age emerged as a significant determinant of educational attendance, with younger individuals, particularly those aged 15-24, showing markedly higher participation rates. This pattern suggests that interventions aimed at this demographic could yield substantial benefits in terms of educational attainment. Interestingly, the analysis reveals that gender does not significantly influence school attendance, contradicting the prevailing assumption that girls are less likely to attend school than boys due to cultural biases. The nearly equal attendance rates for

males (16.32%) and females (16.09%) imply that socio-economic factors, rather than gender alone, play a more decisive role in educational outcomes.

The study's findings suggest several actionable recommendations. First, enhancing economic support for families in lower wealth quintiles could alleviate some of the financial burdens that lead to the withdrawal of girls from school. Second, targeted educational programs aimed at younger populations, particularly in rural areas, could help bridge the gap in attendance rates. Third, there is a pressing need for infrastructure development in underserved regions to ensure that all children have access to safe and supportive learning environments.

In conclusion, the modeling of female education attendance in Somalia reveals a complex interplay of socio-economic, geographic, and demographic factors. Addressing these interconnected challenges through targeted interventions and policies will be crucial for improving educational outcomes for women in Somalia and, by extension, in other regions of Sub-Saharan Africa. The findings emphasize the importance of a holistic approach that not only seeks to improve educational access but also tackles the underlying socio-economic and cultural barriers that persistently hinder female educational participation.

6.0. STUDY LIMITATION

The study relies on data from the Somali Health and Demographic Survey (SHDS) 2020, which may not fully represent the entire population of Somalia, particularly in conflict-affected areas where data collection can be challenging.

The cross-sectional design of the study limits the ability to establish causal relationships between the identified factors and female education attendance. Longitudinal studies would provide more insight into how these factors influence educational outcomes over time.

While the study examines various socio-economic, demographic, and geographic factors, it may not capture all relevant variables, such as cultural attitudes toward education, family dynamics, or local governance, which could also significantly impact female education.

7.0. CONCLUSION

The results of this study highlight the multifaceted challenges affecting Female education attendance in Somalia. Socioeconomic factors, regional disparities, and age-related barriers significantly influence FE enrollment, reflecting broader issues of inequality and access within the country. Addressing these challenges requires a comprehensive approach that includes policy reforms, increased investment in educational infrastructure, and targeted community interventions. By focusing on these critical areas, stakeholders can work towards creating an inclusive and supportive educational environment that provides all female in Somalia with the foundational learning experiences essential for their holistic development and future success.

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