

# Education in Sudan: Disparities in Enrollment, Attainment and Quality

Ebaidalla M. Ebaidalla and Tarig Alhaj Rakhy

# **EDUCATION IN SUDAN: DISPARITIES IN ENROLLMENT, ATTAINMENT AND QUALITY**

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## Abstract

This paper examines the state of education in Sudan, utilizing data from the Sudan Labor Market Panel Survey (SLMPS, 2022). It focuses on various education performance indicators, including enrollment rates, school progression and barriers to education. The paper highlights the disparities in educational enrollment, attainment and performance, across gender, geographic regions and family socioeconomic backgrounds. The analysis indicates remarkable progress in preschool education in Sudan in recent years, although notable disparities persist across different regions, locations and socioeconomic statuses. The results show that those residing in urban areas are more likely to enroll in education compared to their rural counterparts. Moreover, individuals belonging to affluent households with educated parents have a higher likelihood to enroll and complete higher education levels. The results also reveal noticeable disparities in enrollment and attainment across regions. Individuals residing in Darfur, Kordufan and Eastern regions exhibit lower levels of educational enrollment and attainment, compared to those living in Central region and Khartoum. The illiteracy rate in Sudan remains alarmingly high, especially among rural females living in poor households. Furthermore, the study indicates multiple barriers to accessing education, including the lack of schools, poverty, customs and traditions. Female students predominantly discontinued their education due to marriage, parental preferences, school fees and cultural norms. Male students dropped out of school primarily because they needed to support their families. Finally, the paper ends with some policy recommendations aimed at enhancing access to education and reducing educational disparities in Sudan.

**Keywords:** Education enrollment, education attainment, SLMPS, Sudan

**JEL Classifications:** I100, I21, I24, I28

## ملخص

تبحث هذه الورقة في حالة التعليم في السودان، باستخدام بيانات من المسح التتبعي لسوق العمل السودانية (SLMPS)، 2022. وهو يركز على مختلف مؤشرات الأداء التعليمي، بما في ذلك معدلات الالتحاق بالمدارس، والتقدم المدرسي، والحواجز التي تعترض التعليم. تسلط الورقة الضوء على التفاوتات في الالتحاق بالتعليم والتحصيل والأداء، عبر النوع والمناطق الجغرافية والخلفيات الاجتماعية والاقتصادية للأسرة. يشير التحليل إلى تقدم ملحوظ في التعليم قبل المدرسي في السودان في السنوات الأخيرة، على الرغم من استمرار التفاوتات الملحوظة عبر مختلف المناطق والمواقع والأوضاع الاجتماعية والاقتصادية. تظهر النتائج أن المقيمين في المناطق الحضرية هم أكثر عرضة للالتحاق بالتعليم مقارنة بنظرائهم الريفيين. علاوة على ذلك، فإن الأفراد الذين ينتمون إلى أسر معيشية ثرية ذات آباء متعلمين لديهم احتمالية أكبر للالتحاق بمستويات التعليم العالي وإكمالها. تكشف النتائج أيضًا عن تفاوتات ملحوظة في الالتحاق والتحصيل عبر المناطق. ويظهر الأفراد المقيمون في مناطق دارفور وكردفان والشرق مستويات أدنى من الالتحاق بالمدارس والتحصيل التعليمي، مقارنة بالأفراد الذين يعيشون في المنطقة الوسطى والخرطوم. لا يزال معدل الأمية في السودان مرتفعًا بشكل يندرج بالخطر، لا سيما بين الإناث الريفيات اللاتي يعشن في أسر معيشية فقيرة. علاوة على ذلك، تشير الدراسة إلى عوائق متعددة أمام الوصول إلى التعليم، بما في ذلك نقص المدارس والفقر والعادات والتقاليد. وأوقفت الطالبات تعليمهن في الغالب بسبب الزواج وتفضيلات الوالدين والرسوم المدرسية والمعايير الثقافية. ترك الطلاب الذكور المدرسة في المقام الأول لأنهم كانوا بحاجة إلى إعالة أسرهم. وأخيرًا، تنتهي الورقة ببعض التوصيات الرامية إلى تعزيز فرص الحصول على التعليم والحد من الفوارق التعليمية في السودان.

## **1. Introduction**

Education and training are fundamental inputs for enhancing a nation's productivity and maximizing individuals' opportunities not only to secure jobs but also to secure high-quality employment (Acemoglu and Autor, 2011; Glewwe et al., 2014). Education empowers workers by equipping them with the necessary skills and knowledge to access employment opportunities, secure higher-paying positions, and achieve success in their careers. Furthermore, education catalyzes economic growth, contributing to a more competitive and dynamic labor market. Therefore, understanding educational patterns and outcomes is very useful for studying labor market dynamics, and thus helpful in designing an effective strategy to improve the well-being of individuals and nations.

Like many fragile countries in the Middle East and North Africa (MENA) region, Sudan has struggled with recurrent economic and political instability, leading to unfavorable human capital outcomes, particularly in the field of education. Despite efforts to expand educational opportunities over the past few decades, the country continues to contend with high rates of illiteracy and school dropout (Ebaidalla and Nour, 2021; UNICEF, 2021). Furthermore, recent statistics from the Sudan Labor Market Panel Survey (SLMPS, 2022) show large disparities in educational attainment and enrollment across regions, age and gender groups (Krafft et al, 2023a).

Given the importance of education in human capital and labor market outcomes, this paper aims to answer the following questions. 1) What are the patterns of education enrolment and attainment in Sudan? 2) To what extent do educational characteristics vary across socioeconomic characteristics such as gender, parental education and household wealth? 3) Do education outcomes differ across residence locations and geographic regions? 4) What are the factors that influence school dropout rates? This paper analyzes the SLMPS 2022 data. It focuses on disparities in enrollment and attainment, while also addressing concerns regarding the school exit and quality of education.

The paper is structured into six sections. Section one outlines the introduction, aims, research questions and contribution. Section two presents some stylized facts about the educational system in Sudan. Section three presents the educational enrolment, while Section four presents the status of educational attainment. Section five discusses education quality issues in Sudan, such as private tutoring and physical punishment. Finally, section six ends with policy recommendations and areas for future research.

## **2. Education system in Sudan: An overview**

The education system in Sudan has experienced several changes and adjustments over time and across different political regimes. Following the independence of the country in 1956, pre-university education was divided into three four-year phases: primary, intermediate and secondary levels. In 1970, primary education was extended to six years, while the intermediate and secondary levels were each reduced to three years. In 1990, the Sudanese government implemented major education reforms, replacing the existing formal education ladder (6+3+3) with a new structure. Under this modification, primary and intermediate levels were merged into a single phase called basic education, consisting of 8 years, while secondary education remained at 3 years, hence

reducing the total years of general education from 12 to 11 years. Additionally, the education system incorporated 2 years of preschool education, either in kindergarten or “*Khalwa*” for Quran memorization, typically beginning at age 4 (UNESCO, 2018).

After the December 2018 revolution, Sudan reverted to the pre-1990s education ladder structure, consisting of primary, intermediate, and secondary stages (6 + 3 + 3). The corresponding age groups for on time entry and progress are 6 – 11 years in primary, 12 – 14 in intermediate, and 15 – 17 in secondary school. According to the Interim National Constitution of the Republic of Sudan (2005), basic education, consisting of primary and later intermediate levels is compulsory and provided by the state free of charge. Each final year of every educational level in Sudan concludes with a standardized exam known as the 'transfer exam', which determines progression to the next educational stage.

At the end of the intermediate level and based on the score acquired on that exam, a student could join one of the two secondary tracks: (1) the general secondary track or (2) the vocational/technical track. The general secondary track is divided into two sections: the scientific and art sections. Alternatively, students can opt for the vocational or technical track, which lasts three years. The vocational or technical track includes four types of education: commercial, industrial, agricultural and women's education.

It is important to note that other types of government schools and institutes are parallel to the official educational ladder and adhere to general educational guidelines. These include religious institutes, craft institutes, national industries institutes and vocational training centers. Some of these institutions are not under the authority of the Ministry of Public Education but are instead affiliated with other governmental bodies, such as vocational training centers associated with the Ministry of Labor and Administrative Reform (Ministry of Education, 2007).

### *2.1 School enrolment and attainment ratios in Sudan: What do national statistics say?*

Education is essential for bringing social change as it enhances human capital, promotes economic growth, and helps explain disparities in per capita income across nations (Schultz, 1992; Krafft, 2015). Furthermore, education generates job prospects for individuals and facilitates access to higher-skilled positions (Glewwe et al., 2014). Sudan has experienced many challenges that have negatively affected the education process, such as a lack of resources allocated by the government, poverty and armed conflicts (Ebaidalla, 2017; UNICEF, 2021). The decrease in government spending on education has led to a noticeable decline in efficiency indicators, such as education attainment and enrollment rates (Ebaidalla, 2018).

To understand enrollment trends according to national statistics, Table 1 represents the gross enrolment ratio for the three educational levels, primary, secondary and tertiary, in Sudan and selected MENA countries<sup>2</sup>.

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<sup>2</sup> Gross primary or secondary enrolment ratio (% gross) - is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown (World Bank, 2023).

**Table 1. Gross enrolment ratio by educational level in Sudan and a sample of MENA countries (percentage, period average)**

	Primary			Secondary			Tertiary		
	2001-06	2007-12	2013-18	2001-06	2007-12	2013-18	2001-06	2007-12	2013-18
Sudan	63	74	76	33	40	47	10	14	17
Egypt	90	93	95	80	69	77	28	28	32
Tunisia	108	104	106	77	86	88	26	33	32
Algeria	111	112	110	77	90	..	18	29	42
Morocco	104	106	108	46	62	73	11	14	30
Jordan	91	85	88	84	76	70	36	39	34
<b>MENA Average</b>	<b>94</b>	<b>95</b>	<b>97</b>	<b>66</b>	<b>70</b>	<b>59</b>	<b>21</b>	<b>26</b>	<b>31</b>

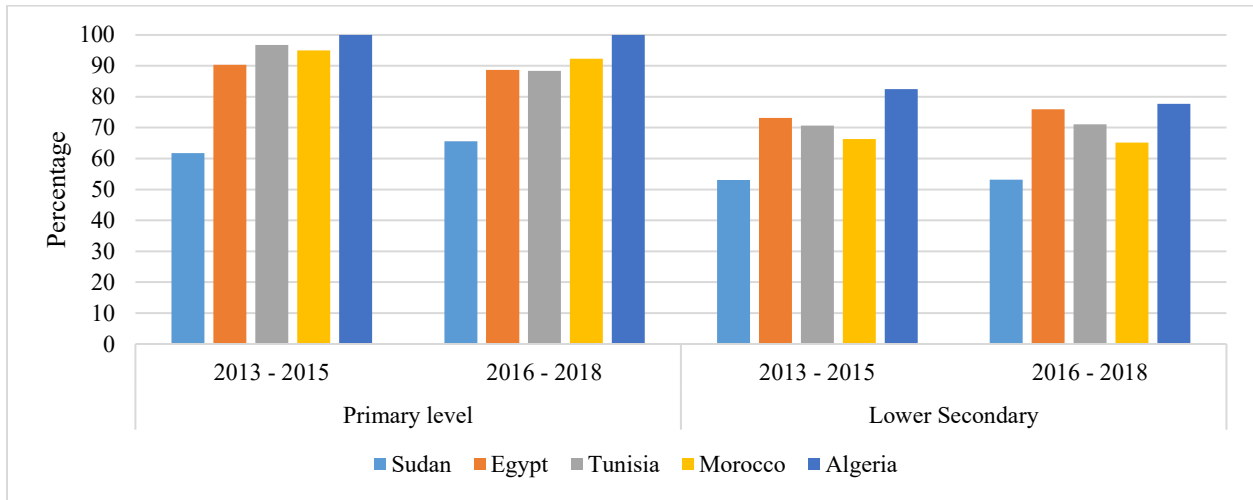
Source: World Bank, World Development Indicators (2023)

The table demonstrates that the enrolment ratios for primary, secondary and tertiary education in Sudan have witnessed some increase since the initial 2001-06 period, as in all countries in the table. However, Sudan had the lowest gross enrolment ratio compared to the other countries. These low rates may be attributed to families' poverty and the prevalence of child labor particularly in rural areas due to economic and political instability (Ebaidalla and Nour, 2021). According to UNICEF (2014), Sudan reported the highest rate of out-of-school children in the MENA region, with approximately three million school-age children (aged 5 -13 years) out of school. The report also indicates that vulnerable groups, including girls, children affected by war, refugees, Internally Displaced Persons (IDPs), those in rural areas and those from impoverished households, face substantial challenges in accessing education. In addition, there are high drop-out rates, especially for girls and children living in rural areas (UNICEF, 2018).

In contrast, the gross enrolment ratio in primary education was high and varied across other countries during 2013-18, ranging from 88% in Jordan – which was slightly lower than the MENA average enrolment rate in 2018, to 95% in Egypt to over 100% in Tunisia, Algeria and Morocco. Concerning the secondary enrolment ratio, Tunisia had the highest average of 88% in 2013-18, and the lowest ratio was in Sudan at 47% and Jordan at 70%. Regarding the tertiary enrolment ratio, Sudan has the lowest ratio among the countries we examine but has increased from 10% in 2001-06 to 14% in 2007-12, and then to 17% in 2013-18. This may be due to the expansion of tertiary education during these decades.

In terms of educational attainment, Figure 1 below illustrates the average completion rates in primary and lower secondary education in Sudan compared to a sample of countries in the MENA region. As indicated below Sudan has the lowest completion rate among other countries in comparison.

**Figure 1. Educational attainment: primary and lower secondary completion rate (percentage of relevant age group) in Sudan and a sample of MENA countries**



Source: World Bank, World Development Indicators (2023)

The low level of education attainment in Sudan is consistent with the low level of school enrolment and high level of illiteracy rates. According to the World Bank (2023), the literacy rate of adults (ages 15 and above) was 35% in 2018, which is very low compared to other countries in the region. This can be attributed to several factors, including school dropouts, the high cost of education, and armed conflicts, all of which stemmed from political and economic instability. It is worth noting that over the past decade, Sudan has experienced recurrent waves of political instability and uprisings, leading to adverse outcomes across all economic sectors (Ebaidalla and Nour, 2021; Ebaidalla and Iddress, 2022; Ebaidalla, 2023a; Krafft et al., 2022).

### 3. Education Enrolment in Sudan

The analysis in this study is based on data sourced from the Sudan Labor Market Panel Survey (SLMPS, 2022), conducted by Sudan’s Central Bureau of Statistics (CBS) and the Economic Research Forum (ERF). The survey was funded by the LSMS+ program at the World Bank and the Growth and Labor Markets | Low Income Countries (GLM | LIC) program at IZA. The SLMPS (2022) is a nationally-representative survey that covers 4,878 households and 25,442 individuals across all eighteen Sudanese states. The survey includes various modules related to demographic characteristics and labor market performance, such as education pattern, housing conditions and durable assets, remittances, income and transfers, and shocks and coping mechanisms (Krafft et al., 2023b; Assaad et al., 2024). To ensure that the sample is nationally representative, we use sampling weights across all analyses.

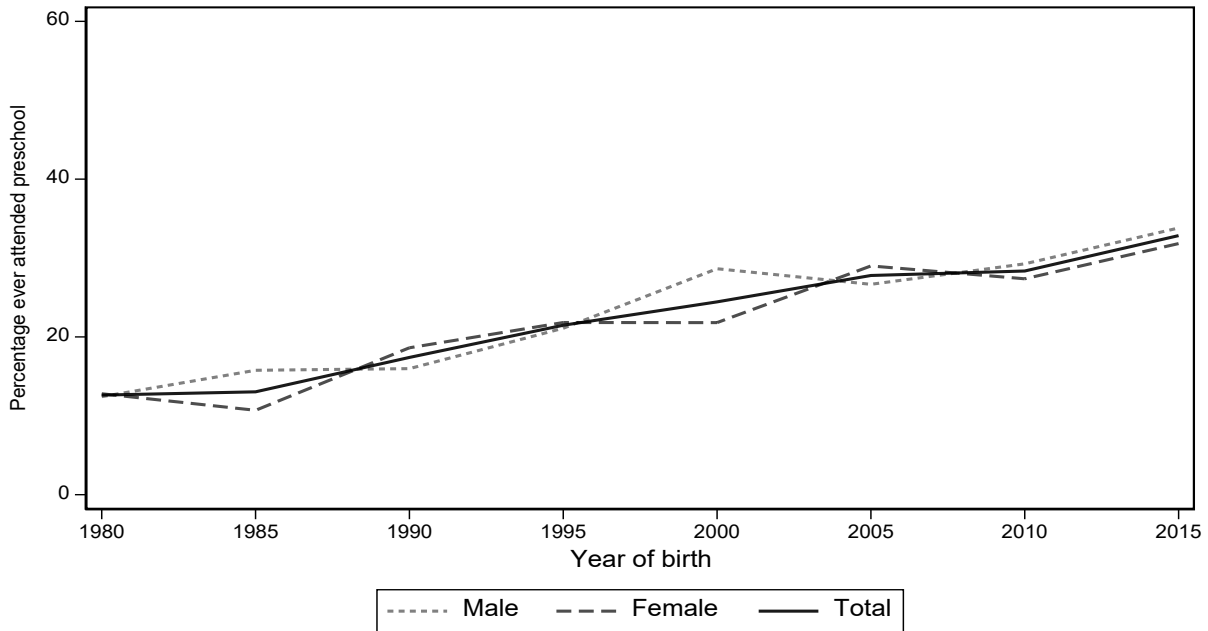


### 3.1 Pre-schooling

Preschool education plays a crucial role in a child’s development, providing the foundation for their future learning and achievement (Krafft, 2015). The positive associations between early childhood education, school competencies, academic performance and labor market outcomes have been found in many studies (Ou and Reynolds, 2006; McCoy et al., 2017; McLeod et al., 2018). Findings have suggested that “early childhood care and education significantly reduces the probability of dropping out, specifically during basic education” (Krafft, 2015). In Sudan, preschool education lasts for two years and is designed for children aged 4 to 6. Preschool programs are offered by the government, private institutions and community organizations.

In Sudan, preschool has seen substantial progress in recent years, with an increasing enrollment rate and growing recognition among families of its importance. Figure 2 shows the rate of preschool attendance, for those who were born between 1980 and 2015, by sex (five-year averages). The graph indicates that the enrollment rate in preschool education for the pre-1995 birth cohort was below 20%, after that Sudan witnessed a relatively increasing trend in preschool education for both males and females, reaching above 30% in 2015, with no appreciable differences by sex. The increase in preschool attendance can be explained by the expansion of public and private schools in recent decades (UNICEF, 2021). Moreover, a considerable portion of primary schools possess preschool facilities, therefore, preschool enrollment has increased appreciably (UNICEF, 2021).

**Figure 2. Percentage ever attended preschool by year of birth and sex, five-year average**

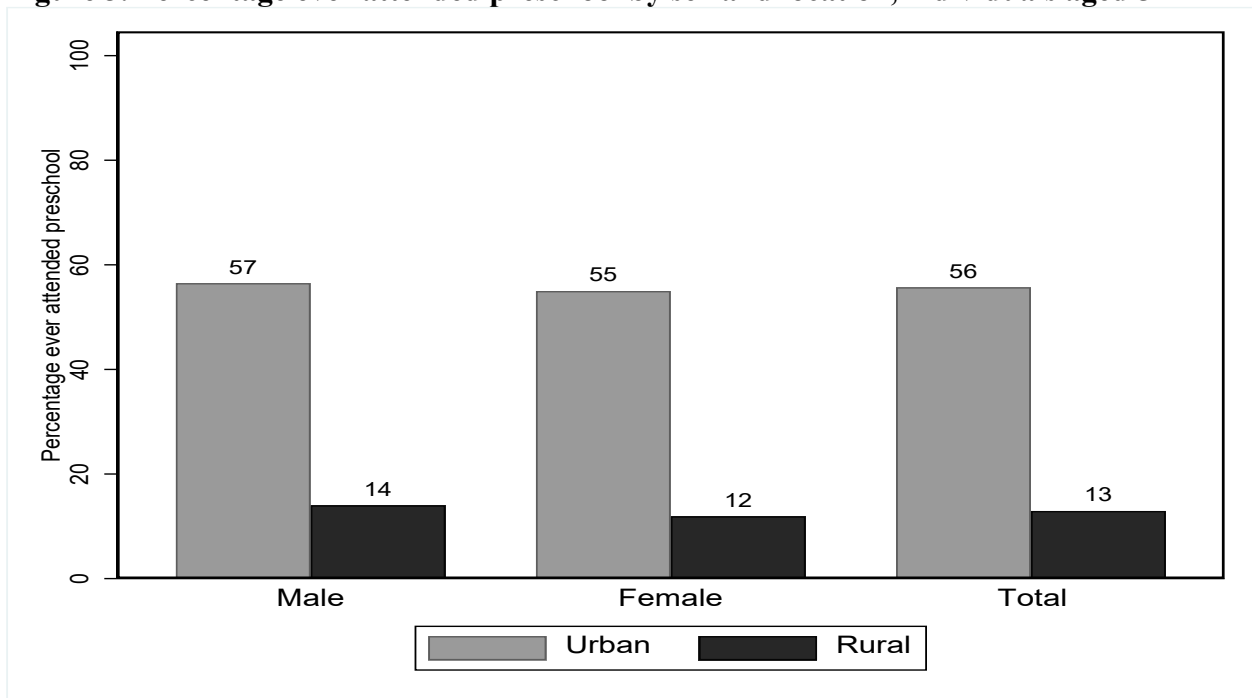


Note: Five-year averages (1980-2015)  
Source: Author's calculations based on SLMPS (2022)

Despite the notable increase in preschool attendance, these percentages remain lower compared to some MENA countries' averages, such as 60% in Jordan (Hailat 2019). The weakness in preschool enrollment rates can be attributed to several factors, including high poverty rates, and education costs, as kindergartens impose registration fees and monthly transportation charges, which poses a challenge for families in urban areas (UNICEF, 2018; UNICEF, 2021).

Figure 3 shows that among individuals aged 5 – 44 years, 56% of those residing in urban areas ever attended preschool, while only 13% of their counterparts in rural areas did so. The figure shows no appreciable gender difference in preschool attendance. Specifically, 57% of males in urban areas attended preschool, compared to only 14% in rural areas. Similarly, 55% of females in urban areas attended preschool, compared to only 12% in rural areas. This urban-rural disparity in preschool enrolment rates can be attributed to the lack of preschool facilities, illiteracy and the prevalence of poverty in rural areas (Etang-Ndip, 2018).

**Figure 3. Percentage ever attended preschool by sex and location, individuals aged 5–44**



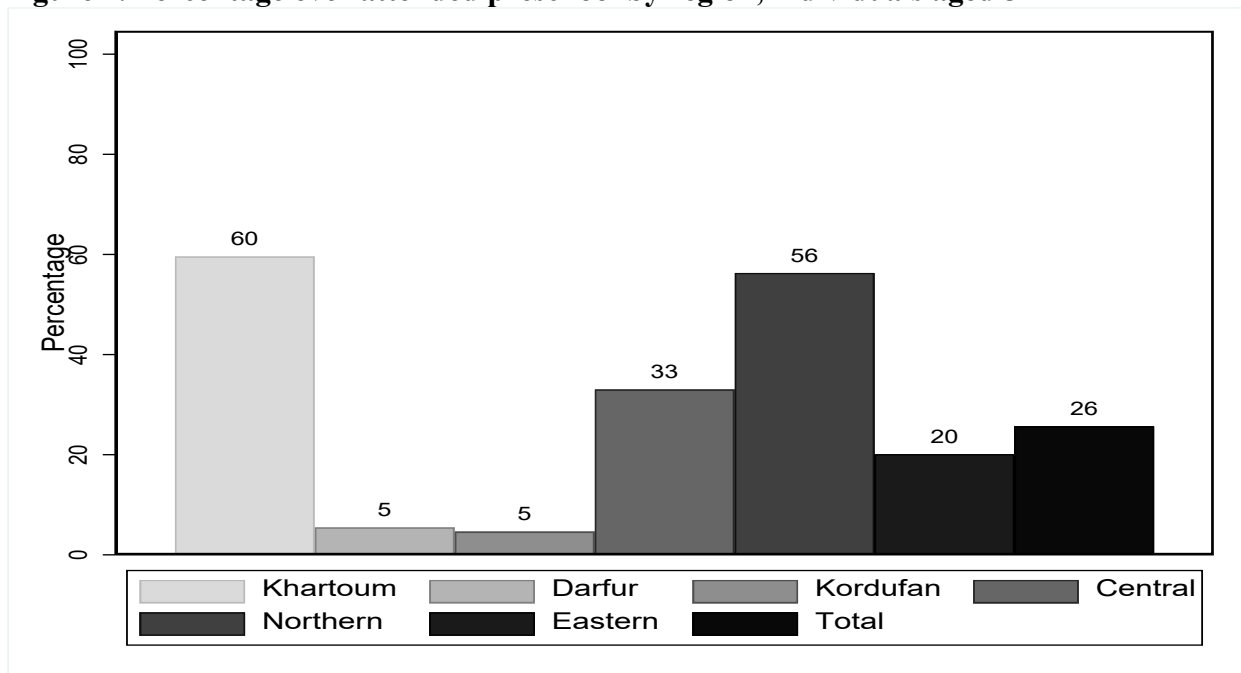
Source: Author's calculations based on SLMPS (2022)

Regarding preschool attendance by region, Figure 4 presents the percentage of individuals aged 5 – 44 years who have attended preschool at some point in their lives, categorized by region. As shown in the figure, Darfur and Kordufan regions have the lowest rates of preschool attendance, with only 5% of individuals having attended preschool. This low rate could be attributed to factors such as poverty, lack of educational facilities, prolonged conflict and displacement which have had a devastating effect on children’s access to education (Etang-Ndip, 2018; UNESCO, 2019; Ebaidalla, 2023b). (UNICEF, 2021; Ebaidalla, 2023b). Moreover, in Kordofan and Darfur, a substantial number of nomadic communities lack access to formal education and the situation has

been further exacerbated by food insecurity, economic hardship and protection concerns (UNESCO, 2019).

As expected, Khartoum reported the highest preschool attendance rate at 60%. This is unsurprising given its status as the country's capital, it therefore possesses advanced education infrastructure compared to other regions. The Northern region – which includes the River Nile and Northern state ranks second after Khartoum, had 56% ever attend preschool. The Central region, consisting of Al Jazeera, White Nile, Blue Nile and Sennar state, reported a rate of 33%. Lastly, the Eastern region, including Kassala, Red Sea, and Gadaref, has a rate of 20%, which is below the national average. These results reflect substantial differences in preschool attendance among regions, which require more efforts and intervention programs by the government, NGOs, and the community to promote preschool attendance among children across Sudan.

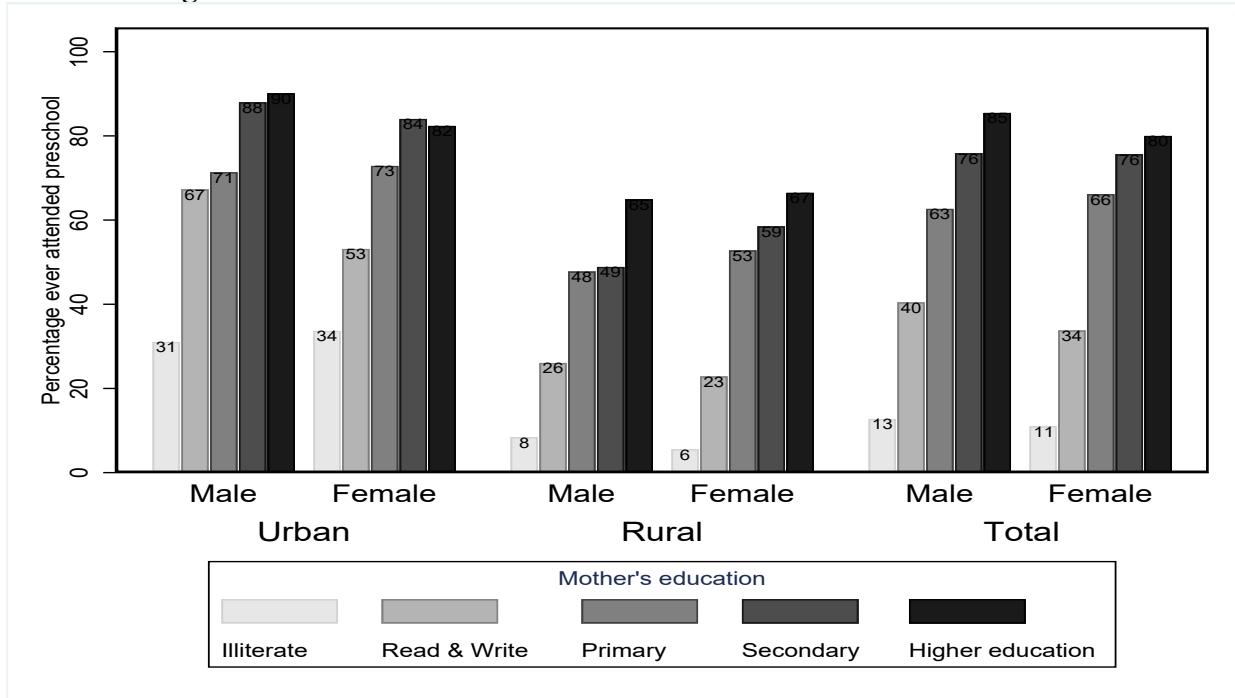
**Figure 4. Percentage ever attended preschool by region, individuals aged 5-44**



Source: Author's calculations based on SLMPS (2022)

Figure 5 illustrates preschool ever attendance by mother's education, sex and location for individuals aged 5-44 years. The figure shows that individuals with illiterate mothers have a very low preschool attendance rate (11% female attendance, 13% male). The ever attendance rates are very low in rural areas for both males (8%) and females (6%) with illiterate mothers. Meanwhile, their peers with illiterate mothers in urban areas had attendance rates of 31% (male) and 34% (female). Moreover, 65% of males and 67% of females in rural areas with highly educated mothers, attended preschool. In comparison, 90% (male) and 82% (female) of their urban counterparts with highly educated mothers attended preschool. In general, preschool attendance showed an increase corresponding to the mother's level of education and residence in urban areas, with no apparent gender bias.

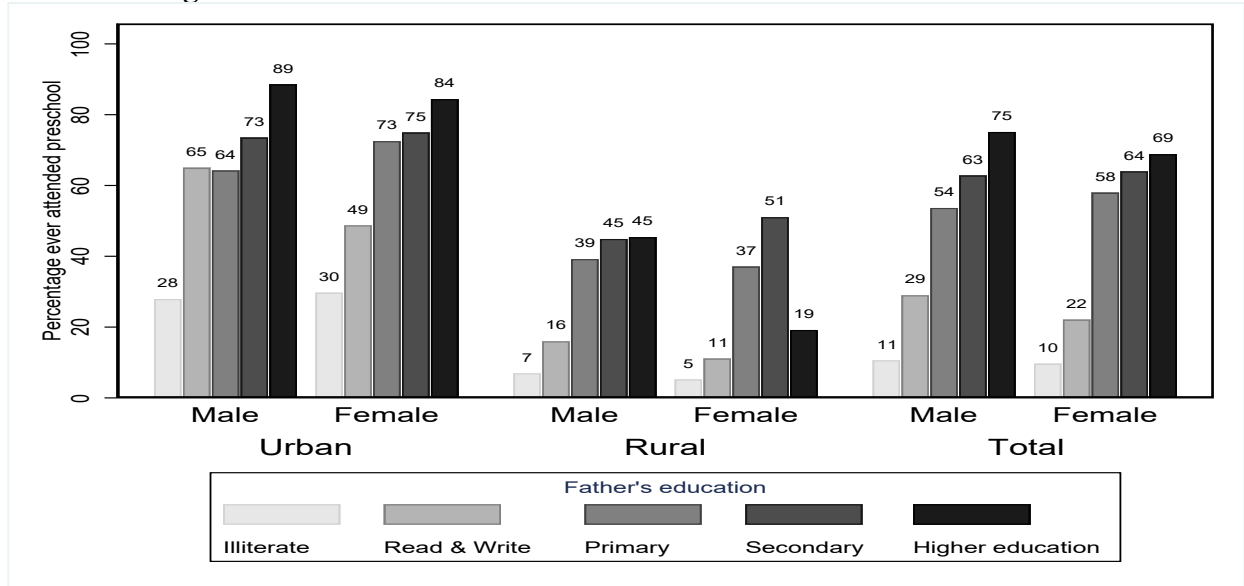
**Figure 5. Percentage ever attended preschool by mother education, sex and location, individuals aged 5-44**



Source: Author's calculations based on SLMPS (2022)

Likewise, Figure 6 presents the percentage of individuals aged 5-44 who ever attended preschool, categorized by father's education, sex and location. Interestingly, only 19% of females in rural areas, with fathers who have higher education attended preschool. In contrast, 84% of their urban counterparts with highly educated fathers attended preschool. This pattern could be attributed to social norms and traditions that discourage girls' education and the lack of preschool facilities and teachers in rural areas compared to urban ones (Duany, 1999; UNICEF, 2018). The UNICEF (2021) report indicates that most schools in rural and nomadic regions face a deficiency in access to clean water and/or gender-sensitive sanitation facilities, impacting both attendance and educational progress.

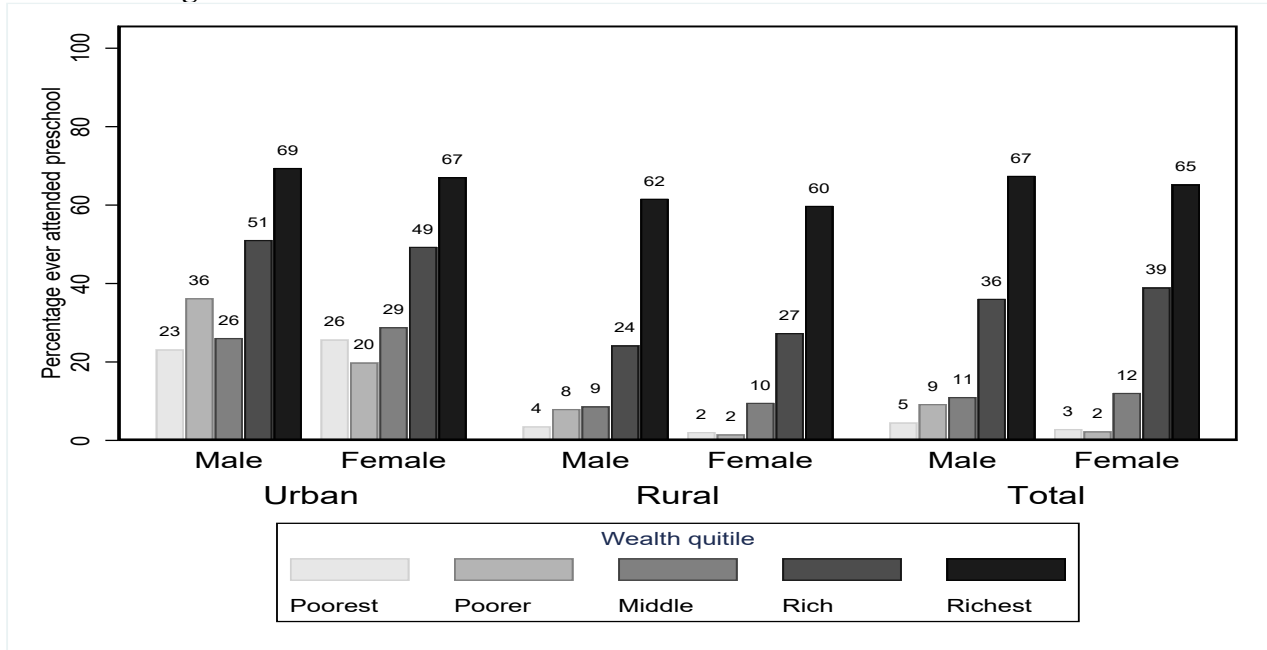
**Figure 6. Percentage ever attended preschool by father education, sex and location, individuals aged 5-44**



Source: Author's calculations based on SLMPS (2022)

Regarding preschool education by household wealth and location, Figure 7 illustrates the percentage of individuals aged 5-44 who ever attended preschool, categorized by their current wealth quintile, sex and location. The figure shows that only 5% of males in the poorest households attended preschool, compared to 67% in the richest households. Furthermore, individuals from the poorest households residing in rural areas are less likely to attend preschool. Figure 7 indicates that only 4% of male children from the poorest quintile of households and 2% of female children from the poorest households living in rural areas attended preschool. In comparison, 62% and 60% of their rural counterparts in the richest quintile attended preschool education. However, individuals residing in urban areas have a higher likelihood of attending preschool for both males and females. Therefore, these findings imply that there are remarkable disparities in preschool enrollment across household wealth quintiles, suggesting that household wealth is a key driver of preschool attendance in Sudan. This result aligns with previous studies conducted in Sudan (e.g., Etang-Ndip, 2018; Ebaidalla, 2018; and UNICEF, 2021), which suggest that individuals from impoverished households are less likely to access education.

**Figure 7. Percentage ever attended preschool by wealth quintile, sex, and location, individuals aged 5-44**



Source: Author's calculations based on SLMPS (2022)

### 3.2 Enrollment in primary, secondary and higher education

Education enrollment plays a crucial role in shaping individual lives and contributing to the overall development of societies. This section describes the net enrollment rates of Sudanese people in different educational levels and their characteristics. The Net Enrollment Rate (NER) is a key educational indicator utilized to evaluate the accessibility and equity of educational institution services. NER is defined as the proportion of children at the official school age who are currently enrolled in school, relative to the total population of children at the official school age (Michaelowa, 2007; Brenyah, 2018). In contrast to gross enrollment rate (GER) that presented in table 1, the NER accounts for age-specific enrollment, whereas the GER does not<sup>3</sup>.

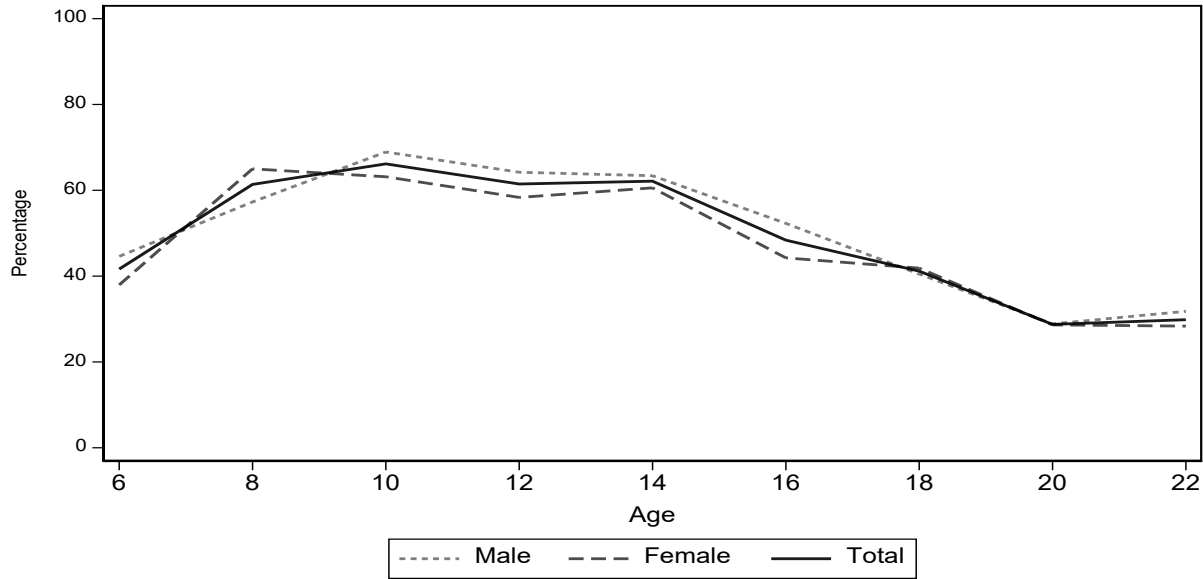
Figure 8 shows the net enrollment rate by age group<sup>4</sup> and sex. The figure shows that individuals aged 6-14 years have the highest net enrollment rates, with over 60% of them enrolled in education. This age group falls within the primary education range. However, this percentage is lower than the MENA average enrollment. For instance, in Jordan, 100% of children aged 6 – 13 years are enrolled in education (Hailat, 2019). This NER gap may be due to low family income and high poverty rates (Etang-Ndip, 2018; Ebaidalla, 2017). Many families face the difficult decision of balancing child education against child labor to cover essential living costs. Data from the World Development Indicators reveals that approximately 31% of all children aged 7-14 are engaged in the labor market (World Bank, 2023). Furthermore, Elamin (2023) suggested that in Sudan father

<sup>3</sup> The gross enrollment ratio represents the ratio of total enrollment, irrespective of age, to the population within the age group that corresponds to the specified level of education (Goldin, 2001; Omodero and Nwangwa, 2020)

<sup>4</sup> Age groups: primary (ages 6-14); secondary (ages 15-17); and higher education (for ages 18–22),

unemployment, increases child school dropout by 28% on average in the sample of all children. This also aligns with available statistics as over 2 million children in Sudan were out of school in 2018, with 34% of children not attending primary school (World Bank, 2023).

**Figure 8. Net enrollment rate (percentage) by age and sex**

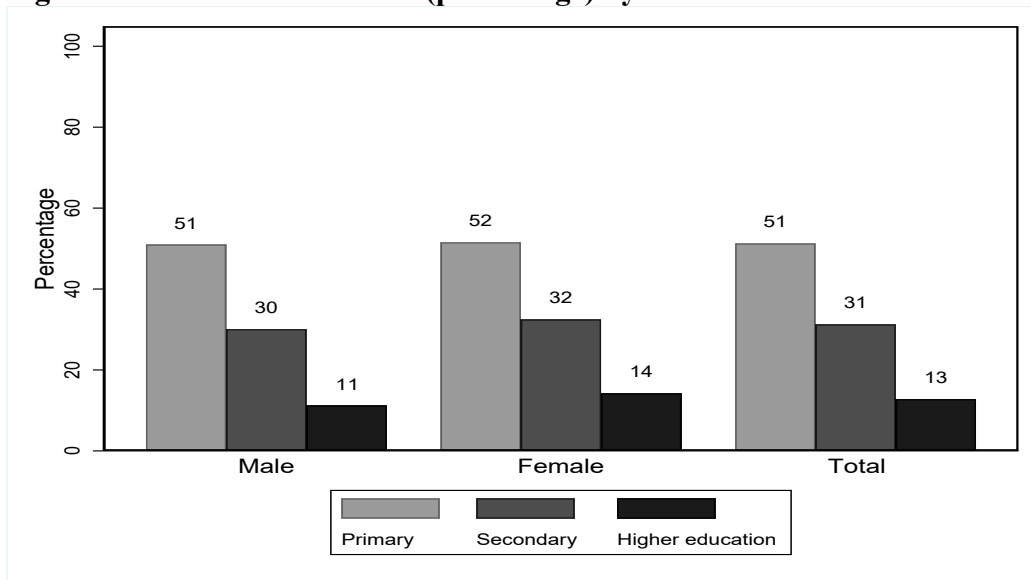


Note: Measure the trend of net enrolment rate among individuals aged 6-22 years  
 Source: Author's calculations based on SLMPS (2022)

It is also noteworthy that the net enrollment rates begin to decline after the age of 14 and gradually decrease as individuals advance in age, as for the age group of 15-17 years, the enrollment in secondary education has declined compared to the younger age groups in primary, dropping to less than 40%. This decline could be attributed to poverty, unemployment and parental education as a key determinant of enrollment (World Bank, 2018). Similarly, the net enrollment rate for individuals aged between 18 and 22 years and pursuing higher education is below 30%. This suggests that only a third of those aged 18-22 years have the opportunity to pursue higher education, while the majority may enter the labor market, particularly the informal sector. There are no major gender differences in terms of enrollment in education at various levels.

Regarding net enrollment rate by sex, Figure 9 illustrates that net enrollment rates are higher for both males (51%) and females (52%) in primary school. However, net enrollment rates declined for both genders at the secondary school level, dropping to 30% for males and 32% for females. In higher education, net enrollment rates were relatively low for both males (14%) and females (13%). It is worth mentioning that the net enrollment rates (NER) presented in Figure 9 are lower than the gross enrolment rates (GER) reported in table 1. This discrepancy is likely because the NER adjusts for age-specific enrollment, while the GER does not.

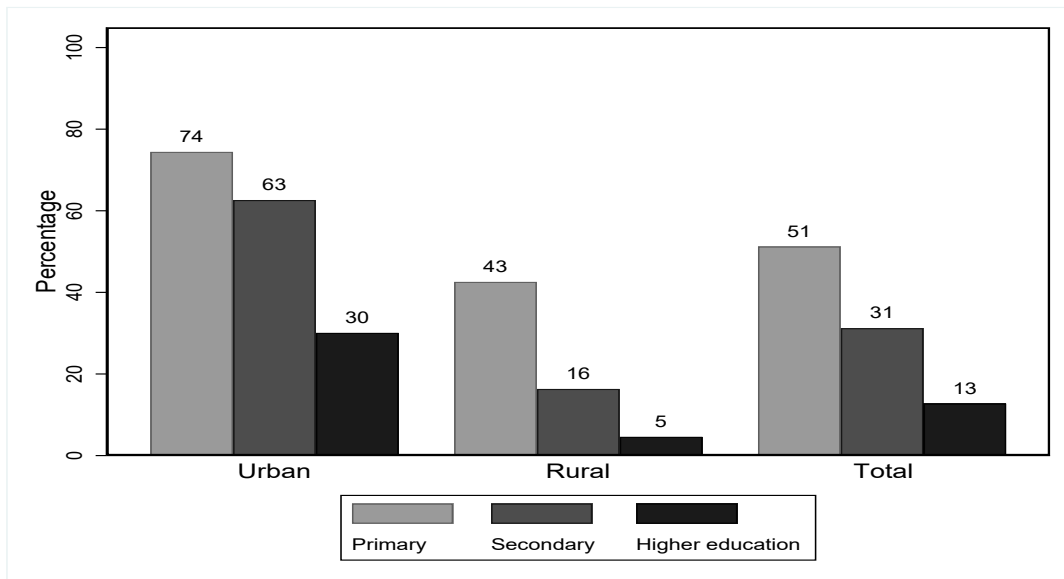
**Figure 9. Net enrollment rates (percentage) by sex**



Source: Author's calculations based on SLMPS (2022)

There are sizeable disparities in net enrollment between rural and urban areas. Figure 10 demonstrates the net enrollment rate by education level and location. For instance, in urban areas, the net enrollment rate in primary schools was 74% compared to only 43% in rural areas. These discrepancies continued to widen at the secondary and higher education levels. In urban areas, 63% of children were enrolled in secondary education, whereas only 16% of their rural counterparts attended secondary school. Similarly, in higher education, only 5% of rural residents were enrolled, while 18% of urban residents were enrolled.

**Figure 10. Education net enrollment rate by location**



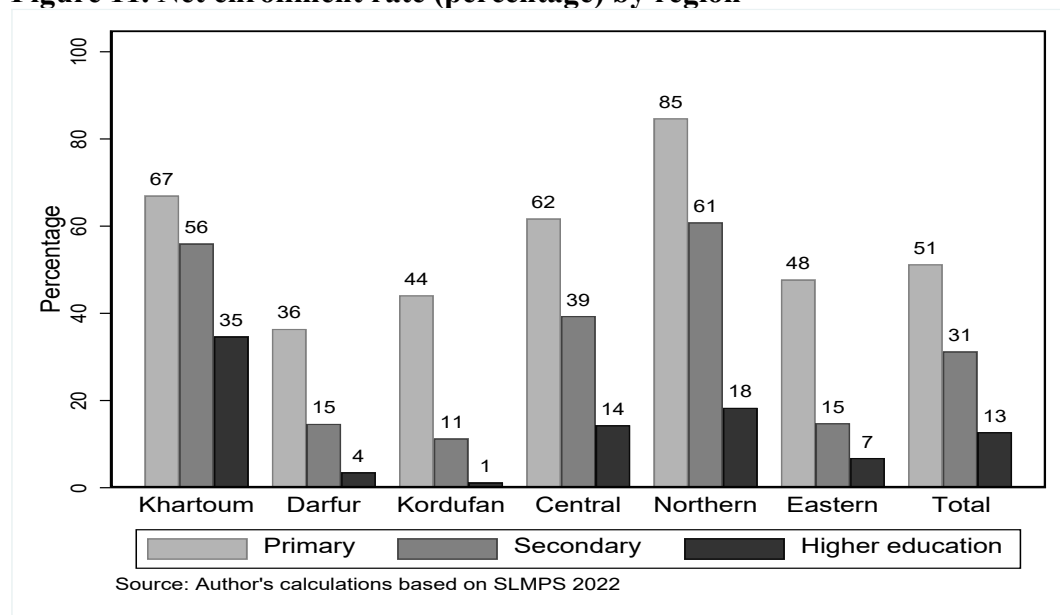
Source: Author's calculations based on SLMPS (2022)



These disparities in net enrollment rates can be attributed to substantial variations and inequalities in terms of the quantity and quality of education facilities, teachers, healthcare, access to safe water, household income, family education background, and security and stability between rural and urban areas (World Bank, 2018; UNICEF, 2021). Households with higher income and educated heads, residing in urban areas tend to allocate more funds to education compared to poor and rural households in Sudan (Ebaidalla, 2017). In general, the low rate of net enrollment in education is likely to persist over time as an institutional problem in Sudan, unless it is treated seriously.

Concerning net enrollment rate in education by region, Figure 11 demonstrates sizeable disparities, highlighting differences in access and opportunities. Interestingly, the Northern region has the highest net enrollment rate in primary education (85%), followed by Khartoum at 67%. The Central region has an enrollment rate of 62%, and the Eastern region has a rate of 48%, Kordufan has a rate of 44%, and Darfur has the lowest rate at 36%. In terms of secondary education, the Northern region also has the highest net enrollment rate, at 61%. Darfur and Kordufan have rates of only 4% and 11%, respectively. Furthermore, the net enrollment rate in higher education is particularly very low in Kordufan, where only 1% of individuals are enrolled. In the Darfur region, the rate is slightly higher, at 4%. In contrast, 35% of individuals in Khartoum are enrolled in higher education. These disparities in education net enrollment rates by location could be attributed to various factors, such as poverty, conflicts and displacement, social culture, limited infrastructure, lack of education facilities, and other economic hardships specifically affecting the Darfur and Kordufan regions. (UNESO, 2019; UNICEF, 2021). Finally, Khartoum reports the highest net enrollment rate of higher education (54%) in Sudan, reflecting its status as the most populous state and host more than half of the country's higher education institutions (Beshir et al., 2020).

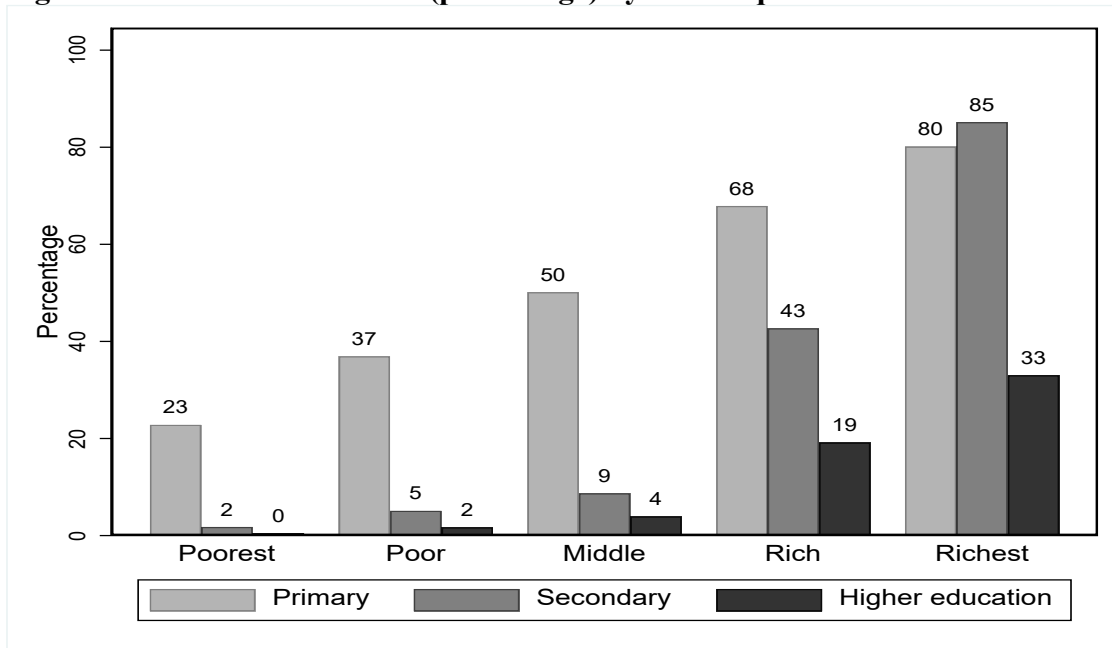
**Figure 11. Net enrollment rate (percentage) by region**



Source: Author's calculations based on SLMPS (2022)

Household wealth substantially influences children's access to education. Figure 12 demonstrates the net enrollment rate in education according to wealth quintile, highlighting remarkable disparities in educational opportunities between the poorest and richest groups. For instance, 23% of children in the poorest families are enrolled in primary education, in contrast to 80% among the richest families. Similarly, only 0% of the poorest quintile enrolled in higher education, while 33% of their counterparts in the richest quintile did so. These variations in net enrollment rates among wealth quintiles underscore the important role of wealth in accessing education in Sudan. This further corroborates the fact that individuals from poor households are less likely to access education (Ebaidalla, 2018).

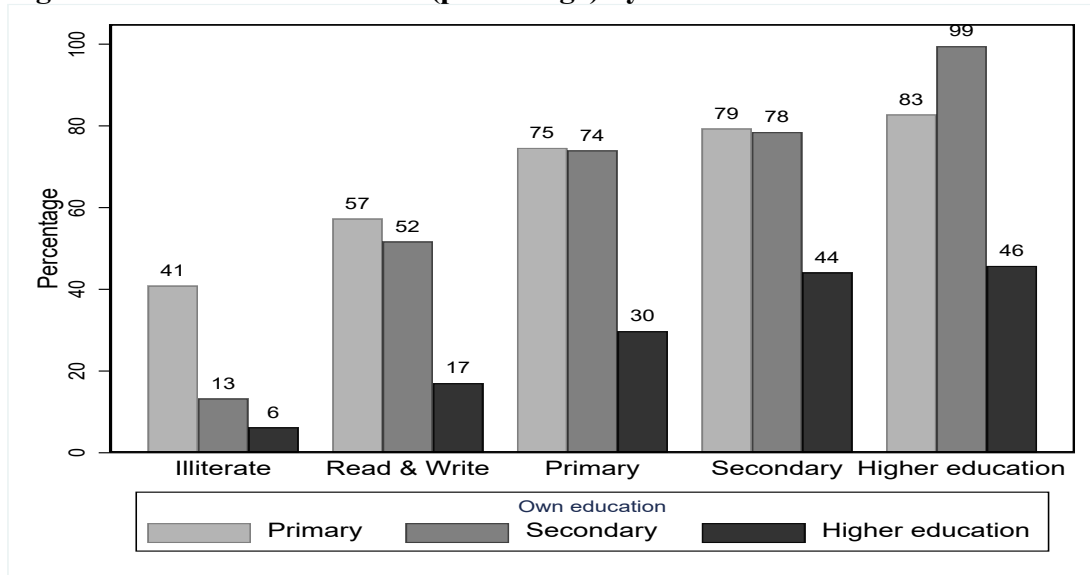
**Figure 12. Net enrollment rate (percentage) by wealth quintile**



Source: Author's calculations based on SLMPS (2022)

Figure 13 shows the net enrollment rate, by mother's education. The figure highlights a large enrollment gap in all education levels between individuals with illiterate mothers and those with university-educated mothers. Only 41% of individuals with illiterate mothers were enrolled in primary education, while their counterparts with higher-education mothers had an 83% enrollment rate. The gap in university net enrollment rates is even wider, at 40 percentage points. Only 6% of individuals with illiterate mothers attended higher education, whereas those with mothers who had higher education degrees had a 46% enrollment rate. These results demonstrate a strong correlation between a mother's education and her children's enrollment in education. Similarly, this result holds for net enrollment rates based on the educational attainment of fathers and the gender of the children. Therefore, we conclude that there is no difference between the influence of mothers' and fathers' education on their children's enrollment rates.

**Figure 13. Net enrollment rate (percentage) by mother’s education**

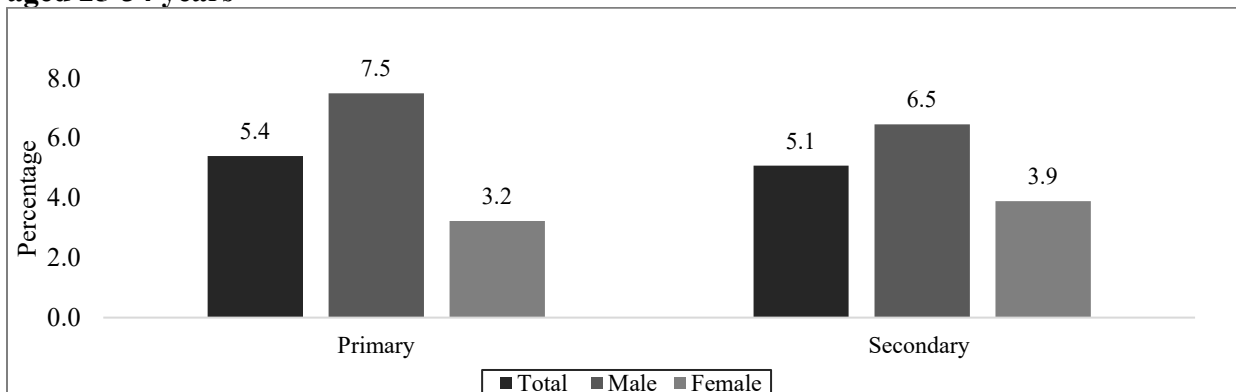


Source: Author's calculations based on SLMPS (2022)

### 3.3 School dropout

A school dropout is defined as a student who leaves their education before completing a certain level of schooling, such as primary, secondary or higher education. Based on the school progression map presented in Appendix I, Figure 14 reports the percentages of school dropouts for individuals aged 25-34 years, among those who have ever attended that level. Due to negligible dropout rates in higher education, the figure presents results only for primary and secondary levels. The figure shows that the rates of school dropout for male students are higher than that of female students in both primary and secondary levels. Moreover, the rate of school dropouts for primary is slightly higher than that of the secondary level.

**Figure 14. School dropout before completing education levels (percentage), individuals aged 25-34 years**

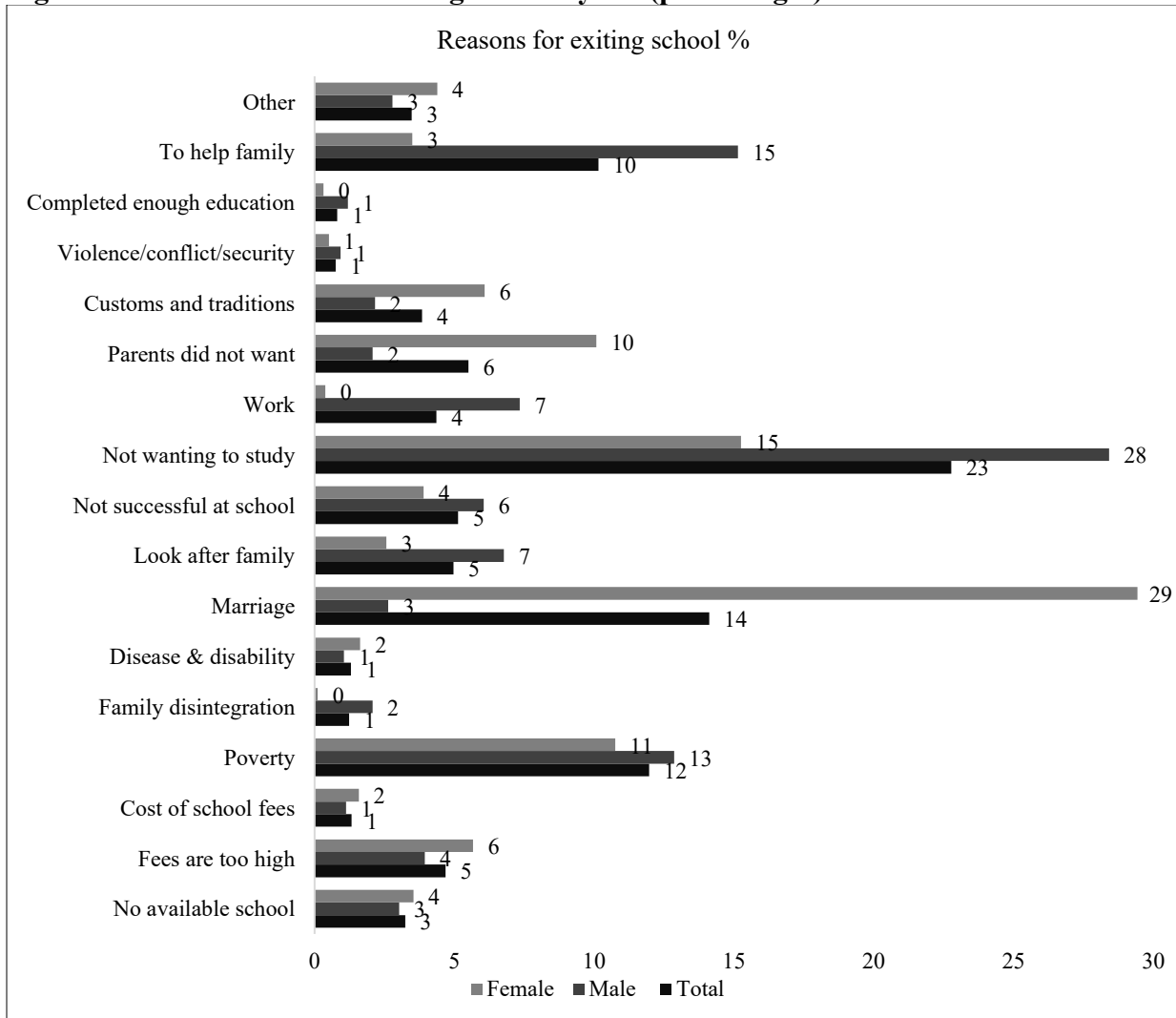


Source: Calculated from schooling progression based on the SLMPS (2022)

### 3.4 Reasons for school exit

Figure 15 illustrates the main reasons for school dropouts by sex, for those who ever enrolled in school. The figure revealed that among males, the main reason for exiting school was the lack of interest in studying (28%), whereas for females, it was marriage (29%). Indeed, early marriage for women is notably prevalent in Sudan, especially in rural areas (Krafft et al., 2023b; Krafft et al., 2023c). Further reasons for male students leaving school include assisting the family, poverty, family responsibilities and struggling academically. On the other hand, female students left school primarily due to personal aspirations, academic difficulties, parental wishes, school fees and cultural norms. This result is consistent with the study of Finchman (2018). Factors such as, family breakdown, illness or disability, conflicts, and achieving a sufficient level of education also contributed to students leaving school, but to a lesser extent.

**Figure 15. Main reasons for exiting school by sex (percentages)**

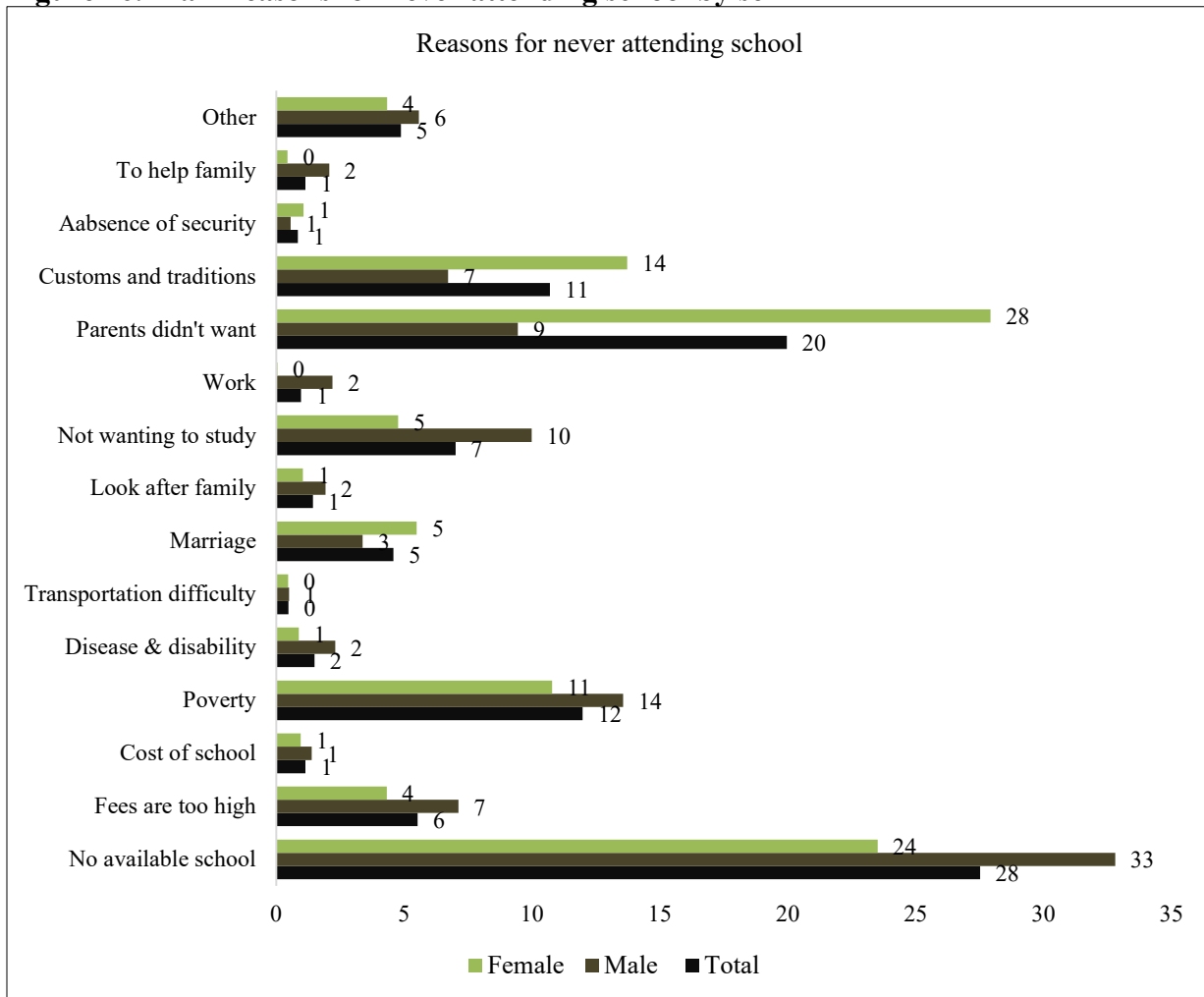


Source: Author's calculations based on SLMPS (2022)

### 3.5 Barriers to Education

Regarding the reasons that individuals never attended school, Figure 16 shows the major barriers to ever entering education. The figure points out that the primary reason for never attending education was the lack of school availability (28%). Parental wishes (20%) also prevented individuals from ever attending school. Poverty (12%), customs and traditions (11%), and individual desires (not wanting to study 7%) were the next common challenges that prevented individuals from participating in education. These were followed by education expenses (fees are too high 7%), marriage (5%) and other reasons (5%), which were the common reasons for never attending school. Additionally, disease and disability, absence of security, work and helping family slightly affected the individual's ability to attend school, at 1%. Regarding female education entry, parents' wishes were the main obstacle (28%) that prohibited females, and to a lesser extent males (9%), from attending school.

**Figure 16. Main reasons for never attending school by sex**



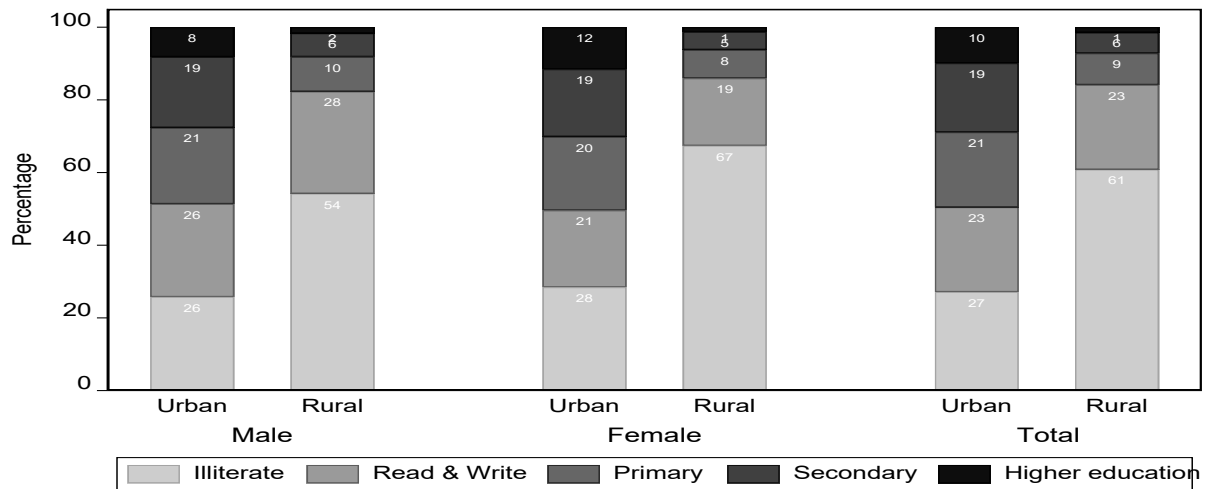
Source: Author's calculations based on SLMPS (2022)

#### 4. Educational Attainment

Educational attainment refers to the highest level of education completed by an individual. This section focuses on the highest level of education successfully completed by individuals aged 6-64 in Sudan, taking into consideration various characteristics. Figure 17 displays the distribution of educational attainment by gender and location of residence. The figure indicates appreciable disparities in educational attainment across gender and location, with high illiteracy rates. We observe that about 61% of ages 6-64 in rural areas were illiterate, and 23% were able to read and write but had not completed a full level of school. Only 9% completed primary education, 6% completed secondary education, and a mere 1% completed higher education in rural areas. In comparison, urban areas had a lower illiteracy rate of 27%, with 23% able to read and write. Only 9% completed primary education, 6% completed secondary education, and a mere 1% completed higher education in rural areas.

Women residing in rural areas are considered underprivileged. The figure reveals that 67% of women aged 6-64 in rural areas are illiterate compared to 28% for those residing in urban areas. Likewise, the illiteracy rate for men residing in rural areas is about 54% compared to 26% for men who live in urban areas. Moreover, the figure indicates that the illiteracy rate in rural area is double the rate of urban areas, implying that those residing in rural areas are more likely to suffer from illiteracy. Overall, urban populations have a higher likelihood to complete higher education levels compared to their counterparts in rural regions. Therefore, this result indicates that there are remarkable disparities in educational attainment across locations.

**Figure 17. Educational attainment (percentage) by sex and location, individuals aged 6-64**

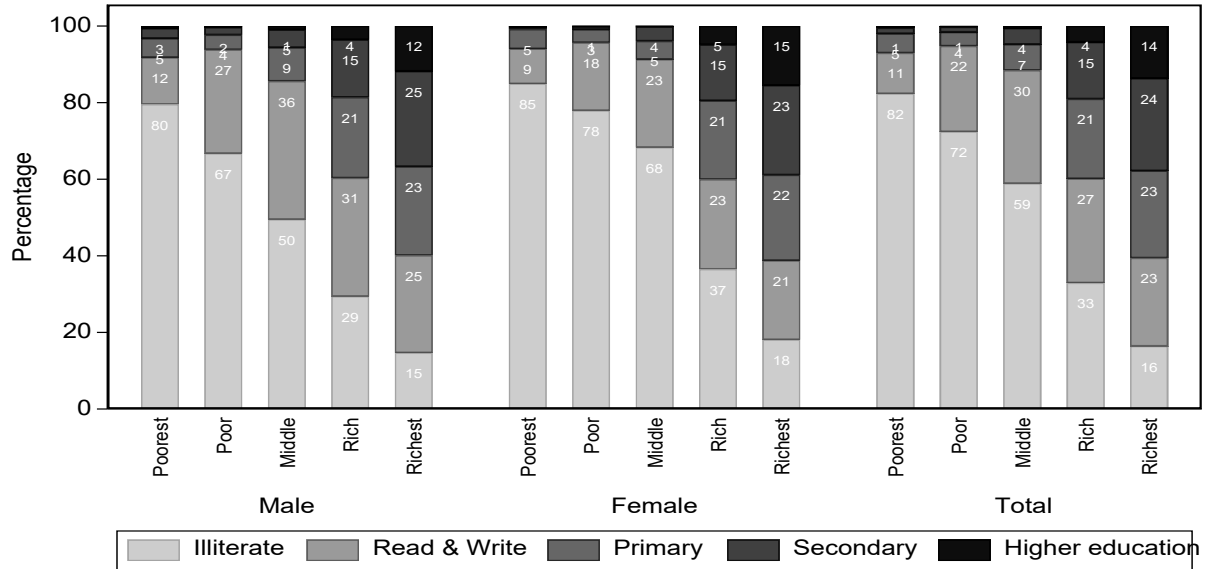


Source: Author's calculations based on SLMPS (2022)

Regarding the distribution of educational attainment by household wealth status, figure 18 reveals large disparities in educational attainment across household wealth quintiles. For instance, among males in the poorest quintile, 80% were illiterate compared to only 15% in the wealthiest quintile. Similarly, only 12% of males in the poorest quintile could read and write but had not completed any education level, compared to 25% of those in the richest quintile. Furthermore, only 5% of individuals in the poorest quintile completed primary education, whereas 23% of their counterparts in the richest quintile achieved this level of education. Likewise, only 3% of individuals in the

poorest quintile completed secondary education, compared to 25% in the richest quintile. Thus, the figure indicates a clear correlation between household wealth and educational attainment is evident, with individuals of higher wealth generally attaining higher education levels.

**Figure 18. Educational attainment (percentage) by household wealth, ages 6-64**

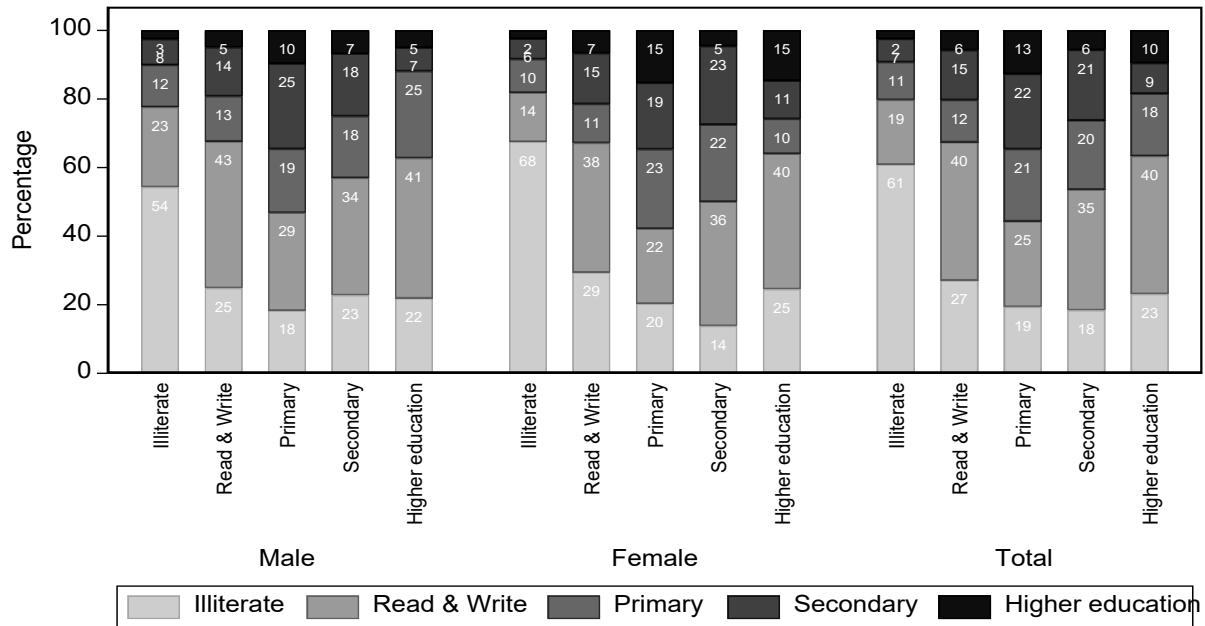


Source: Author's calculations based on SLMPS (2022)

Parents' education level strongly affects their children's enrollment and educational attainment. Children with more educated parents tend to have higher levels of education (Nicholas-Omoregbe, 2010). Figure 19 shows educational attainment by sex and mothers' education. When the mother has no education, basic literacy, or basic education, individuals tend to have lower levels of education. For mothers with basic literacy or basic/secondary education, the illiteracy rate decreased, and there was a slight increase in the opportunity for higher education.

Males with illiterate mothers were relatively better educated than females, with a 14-percentage point gap (Figure 19). Specifically, 68% of females with illiterate mothers were illiterate, compared to 54% of males. However, 15% of females whose mothers had a higher education degree attended higher education, compared to only 5% of males. It is worth mentioning that we obtained similar results regarding educational attainment based on the father's education, indicating that education of both parents exerts remarkable impact on a child's educational achievement.

**Figure 19. Education attainment (percentage) by mother education, ages 6-64**



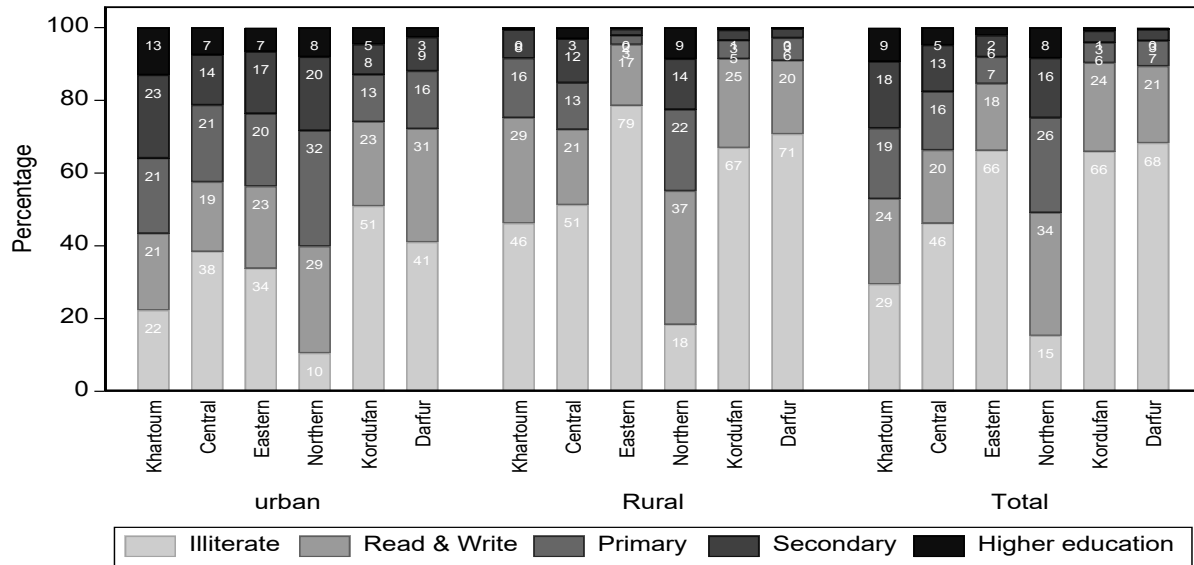
Source: Author's calculations based on SLMPS (2022)

Figure 20 illustrates the distribution of educational attainment by region and location. The figure indicates that Darfur, Kordufan and Eastern regions have the highest illiteracy rates in Sudan, with rates of 68%, 66%, and 66%, respectively. The lower levels of educational attainment in these regions could be attributed to armed conflict, which has resulted in displacement and a lack of educational facilities (UNICEF, 2021). Additionally, poverty has pushed children to participate in the labor market to support their families instead of completing their education (Etang-Ndip, 2018).

On the other hand, the Northern region and Khartoum are far better in terms of educational attainment. The figure shows that Northern region and Khartoum report the lowest illiteracy rates at 15% and 29%, and the highest higher education attainment at 8% and 9%, respectively. It is worth noting that Khartoum has a higher level of population density among regions in Sudan, with an abundance of private and public educational facilities. Across all geographic regions, whether individuals live in rural or urban areas appreciably affects their educational attainment. Educational opportunities and resources are often concentrated in urban areas, which enhances their accessibility to both quantity and quality education (Etang-Ndip, 2018; UNICEF, 2021).



**Figure 20. Education attainment by region (percentage), ages 6-64**



Source: Author's calculations based on SLMPS (2022)

## 5. Quality of education and challenges

### 5.1 School type

Public education dominates all levels of schooling. According to the SLMPS (2022), approximately 93% of students enrolled in primary, 91% of those in secondary and 90% of students in higher education attend public institutions. The percentage of students enrolled in private education averages around 7%, while those attending other types of institutions do not exceed 1% across all three phases of schooling. This fact implies that despite the expansion of private education in Sudan during the last decades following the privatization policies, private schools host a small portion of students. Except for Khartoum, the percentages of students enrolled in private institutions in other regions is negligible, suggesting a weak private education sector. This could be attributed to low demand for private education, likely stemming from the low income and socioeconomic characteristics of families in those areas (Ebaidalla, 2018).

### 5.2 Computer availability

Computers serve as an important indicator of the technological learning resources that are accessible to students. The SLMPS (2022) reveals that the share of students using computer facilities in school did not exceed 2% of students who were enrolled in education during 2022, across all education levels. The low rate of computer usage in education can be attributed to poverty and low household income. This finding is consistent with previous studies (e.g. Nour, 2013; Nour, 2018) which indicate that Sudan exhibits low usage of information and communication technology (ICT) in education.

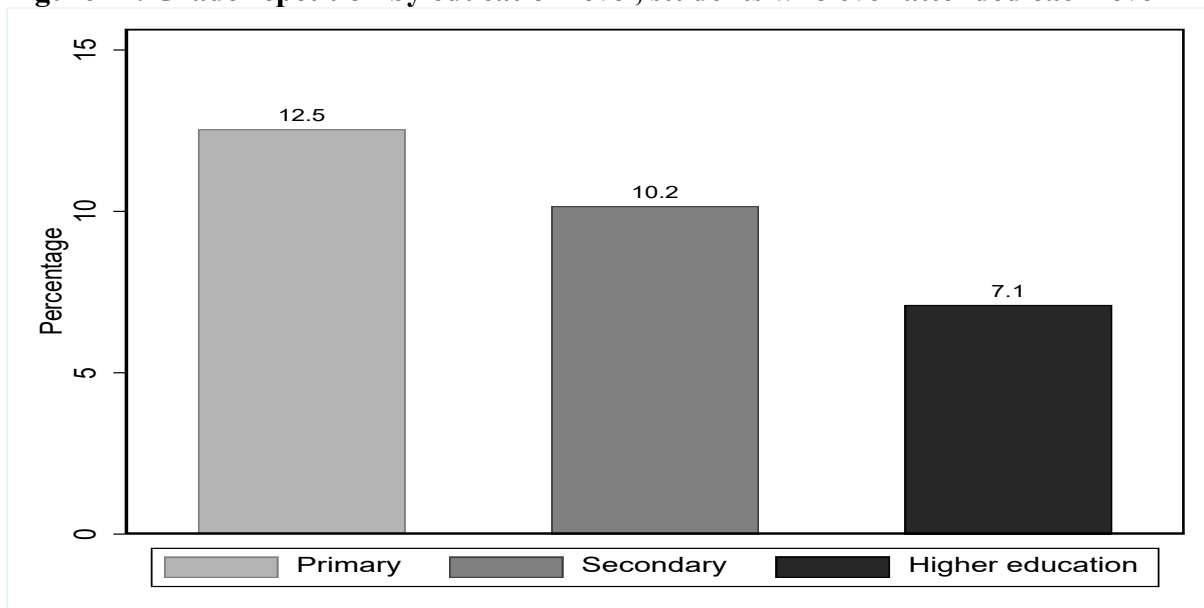
### 5.3 Private tutoring

Private tutoring refers to academic instruction provided outside of regular classroom settings, often by individual tutors or tutoring centers, to supplement or enhance a student's learning experience. The SLMPS (2022) indicates that approximately 2% of students aged between 6 and 18 enrolled in school in 2022 received private tutoring. This percentage is lower than that observed in other MENA countries. For instance, Hailat (2019) indicated that in Jordan, around 4% of students receive private tutoring. Also, Sieverding et al. (2019) found that the percentages of Egyptian students who attended private lessons in primary, preparatory, general secondary and vocational secondary are 20%, 36%, 66% and 15%, respectively. The prevalence of poverty and the high cost of education may be the primary reasons behind the lower rate of private tutoring in Sudan. It is worth mentioning that the prevalence of private education in recent decades has led to a sharp increase in household education expenditure, posing a challenge to household investment in education (Ebaidalla, 2018).

### 5.4 Grade repetition

Grade repetition can have a detrimental impact on a student's self-esteem and motivation. Additionally, it can increase the financial burden of education, particularly for underprivileged families. As a result, this situation may lead to an increase in school dropouts among children, as repeating a grade requires additional time and expenses. Figure 21 displays the rate of grade repetition by educational level. Among those who attended primary, 12.5% repeated a grade of primary, while the rate decreased to 10.2% repeating a grade among those who attended secondary schools. Moreover, for those who ever attended higher education, the rate of grade repetition is the lowest (7.1%).

**Figure 21. Grade repetition by education level, students who ever attended each level**

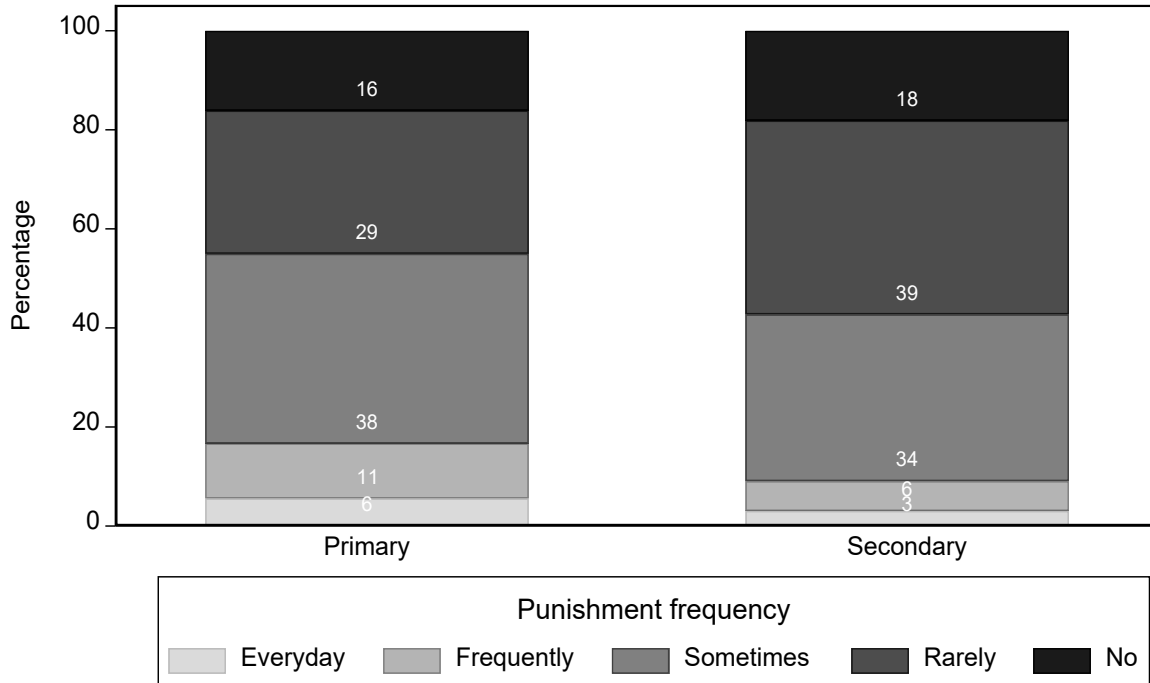


Source: Author's calculations based on SLMPS (2022)

### 5.5 Physical punishment

Physical punishment, often administered by teachers or school administrators, can lead to student injuries and foster an atmosphere of fear and aversion towards school. Consequently, it can also lead to higher rates of students dropping out (Hailat 2019, Rafique and Ahmed, 2019). Figure 22 illustrates the prevalence of physical punishment among current students during primary and secondary education. The figure reveals that there is no appreciable difference between the pattern of punishment between primary and secondary students.

**Figure 22. Physical punishment by education level, current students**



Source: Author's calculations based on SLMPS (2022)

## 6. Conclusions

In light of the importance of education in human capital development and labor market performance, this paper examined the state of education in Sudan using data from the SLMPS 2022. Specifically, the paper investigated the education landscape in recent years, focusing on enrollment, school progression, attainment and the barriers to education. The primary aim of this study was to understand the extent of disparities in educational enrollment, attainment, and performance, considering disparities in sex, place of residence, parental education, and household's socioeconomic characteristics.

The analysis revealed that preschool education in Sudan has undergone appreciable progress in recent years, albeit with notable disparities observed across regions, locations, and family socioeconomic statuses. Those residing in urban areas have a higher likelihood to enroll in

different educational levels compared to their rural counterparts. Moreover, individuals from affluent households with educated parents are more likely to achieve higher levels of educational attainment. Additionally, there are large disparities in educational enrollment and attainment across regions. Individuals residing in Darfur, Kordufan and Eastern regions exhibit lower levels of enrollment and attainment, followed by the Central region and Northern region. In contrast, Khartoum reported the highest levels of education. In general, educational opportunities and resources tend to be concentrated in urban areas, making it easier for urban residents to access education. Finally, the illiteracy rate in Sudan remains alarmingly high, especially in rural areas, as well as among women from poor families.

Furthermore, the study identifies various barriers to accessing education, including insufficient availability of schools, parental preferences, poverty, as well as cultural customs and traditions. Female students predominantly discontinued their education due to marriage, personal aspirations, academic challenges, parental preferences, school fees and cultural norms. Male students dropped out of school primarily because they needed to support their families or faced academic difficulties. Physical punishment was common in both primary and secondary schools. Grade repetition also occurred at all levels of education, perhaps due to limited access to quality education, overcrowded classrooms, teacher shortages as well as factors such as poverty, child labor and learning difficulties. Moreover, the study found that only a small portion of students in Sudan use computers in school, highlighting the inadequate technological infrastructure and prevalence of digital illiteracy.

Based on the aforementioned results, the study offers some policy recommendations to improve access to education and minimize educational disparities. First, the government should allocate more resources for education sector. This will improve the educational environment and expand access, thereby ensuring equal and inclusive education. Second, it is crucial to incorporate educational support into the poverty reduction strategies. This should target disadvantaged communities and vulnerable groups, such as impoverished families, displaced individuals, out-of-school children, girls and students with disabilities. Doing so could reduce educational disparities and illiteracy rates, while also enhancing accessibility, opportunities and academic achievement. Third, policymakers should make significant investments in school infrastructure. Moreover, it is crucial to offer computer training to teachers, especially female educators in rural areas, to empower girls in completing education levels. Fourth, to ensure the success and sustainability of these endeavors, it is crucial to establish strong partnerships between the government, private sector, civil society and community-based organizations, and international partners. These partnerships should collaborate to develop comprehensive policies and programs that uphold education as a fundamental human right for all.

Despite this study offering an important contribution to the Sudanese education literature, a notable limitation lies in the absence of frequent household surveys, which hindered us from analyzing trends in educational characteristics over time. Thus, investing in regular labor force or other household surveys would enable researchers and policymakers to monitor educational dynamics and design effective educational strategies. Furthermore, to gain deeper insights into disparities in educational performance, a comprehensive study investigating factors influencing inequality in enrollment and attainment across regions, gender, and wealth quintiles would be influential for policymakers and stakeholders, including regional and international organizations. Additionally,

conducting an empirical analysis on the returns to education could provide actionable recommendations regarding education quality in Sudan. Finally, an investigation into the determinants of school dropouts would be invaluable for addressing barriers to education.

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### Appendix I: School progression tree

