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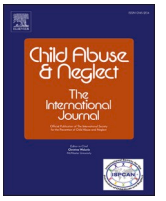

Prevalence of Adverse Childhood Experiences in sub-Saharan Africa: A multicountry analysis of the Violence Against Children and Youth Surveys (VACS)☆

Ermias W. Amene [a,*], Francis B. Annor [a,b], Leah K. Gilbert [b,c], Jordan McOwen [d], Angelo Augusto [e], Pedro Manuel [d], Marie Therese Virginie N'gouanma Nobah [f], Greta M. Massetti [a]

[a] Division of Violence Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, Atlanta, GA, United States
[b] United States Public Health Service Commissioned Corps, United States
[c] Office of the Chief Operating Officer, Office of Safety, Security and Asset Management, Occupational Health Clinic, Centers for Disease Control and Prevention, Atlanta, GA, United States
[d] Epidemiology/Surveillance Branch, Centers for Disease Control and Prevention, Mozambique
[e] Instituto Nacional de Saúde, Mozambique
[f] Division of Global Health HIV and TB, Centers for Disease Control and Prevention, Cote d'Ivoire

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ABSTRACT

Background: Adverse Childhood Experiences are traumatic events early in life and have been associated with significant negative health outcomes.
Objective: To estimate the prevalence of ACEs in five low- and middle-income sub-Saharan African countries.
Participants and setting: Nationally representative data from the Cote d'Ivoire (2018), Kenya (2019), Lesotho (2018), Mozambique (2019), and Namibia (2019) Violence Against Children and Youth Surveys (VACS) were used. Analyses were restricted to youth ages 18–24 years ($n = 8766$ females and 2732 males).
Methods: VACS data were analyzed to generate sex-stratified weighted prevalence of individual ACEs (including sexual, physical, and emotional violence; witnessing interparental violence and violence in the community; and orphanhood) and aggregate ACEs (total ACEs; 0, 1–2, and 3 or more), for each country and combined.
Results: The most common type of ACEs among both females and males was witnessing physical violence (males: 55.0 % [95 % CI: 51.1–58.8] and females: 37.2 % [95 % CI = 34.3–40.1]) followed by experiencing physical violence (males: 49.7 % [95 % CI = 45.5–53.9] and in females: 36.5 % [95 % CI = 33.8–39.2]). Prevalence of sexual violence was significantly higher in females than in males (16.0 % [95 % CI = 13.9–18.2] vs 8.3 % [95 % CI = 7.0–9.8]; $p < 0.001$). About 72 % of females and 82 % of males have experienced at least one form of ACE with 20 % of females and 24.2 % of males experiencing 3 or more ACEs.

☆ CDC disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

* Corresponding author at: Atlanta, GA 30341, United States.
E-mail address: nll3@cdc.gov (E.W. Amene).

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Conclusion: This study demonstrated that majority of the children in countries in sub-Saharan Africa have experienced multiple ACEs in their lifetime. Understanding the extent of the problem will help design early interventions to reduce childhood exposure to ACEs or mitigate against the harmful impact of ACEs.

Childhood exposure to various forms of violence and other childhood adversities is associated with negative health and socioeconomic outcomes later in life (Merrick et al., 2019). Research on the negative health consequences associated with adverse childhood experiences (ACEs) has documented significant and enduring impacts on maldevelopment as well as mental and physical health outcomes (Bellis et al., 2019; Hughes et al., 2021). ACEs include traumatic experiences in childhood, including different forms of violence (physical, emotional, and sexual), witnessing interparental violence in the home, witnessing violence in the community, and living with family difficulties (CDC, 2019). Studies show that severe, frequent, or prolonged adversity in childhood may result in changes to the structure and function of children's brain development resulting in an overactive stress response, difficulty with forming healthy relationships, and increased health risk behaviors (Shonkoff & Garner, 2012). The association between ACEs and poor health outcomes throughout the lifespan have been well documented (Bellis et al., 2019; Boullier & Blair, 2018; Felitti et al., 1998; Hughes et al., 2021). In addition to health effects of ACEs on outcomes such as obesity, cardiovascular diseases, diabetes and cancer, several studies have documented that ACEs are associated with health-related risk factors such as substance misuse, health risk behaviors, and violence perpetration in adulthood (Carr, Martins, Stingel, Lemgruber, & Juruena, 2013; Chu & Chu, 2021; Felitti et al., 1998; Zietz et al., 2020). ACEs can also incur substantial economic burden at the population level through increased medical costs for poor health outcomes and familial economic hardship (Harter & Harter, 2021; Liming, 2019).

To date, most research on ACEs has been conducted in western high-income countries, particularly the U.S., UK, and Europe (Massetti, Hughes, Bellis, & Mercy, 2020). Many regions globally lack comprehensive population data on ACE prevalence as well as associated risk factors and health consequences. A key gap in coverage of ACEs research involves population data from low- and middle-income countries, particularly countries in sub-Saharan Africa. Some studies that have been conducted in this region have relied on convenience samples (Hughes et al., 2017), which have the potential to document associations among variables and outcomes of interest but may reflect biased estimates of prevalence if the data are not fully nationally representative (Tyrer & Heyman, 2016). For example, some research on ACEs in sub-Saharan Africa has employed convenience samples from urban areas or clinical settings, which may reflect significant bias in prevalence and even in associations with health conditions (Hughes et al., 2017; Kessler et al., 2010; Massetti et al., 2020). Some other ACE research was reported in young adults which focused on a small sample of victims to investigate association between ACEs and health outcomes (Schilling, Aseltine Jr., & Gore, 2007). Nationally representative samples reflect the most accurate estimates of population prevalence.

The Violence Against Children and Youth Surveys (VACS) have been conducted or are being planned in over 24 countries. Several international organizations and country governments partnered to initiate, plan and conduct VACS (Nguyen, Kress, Villaveces, & Massetti, 2019). Some studies have used VACS data to assess the prevalence of ACEs and their relationship with specific health outcomes (Kappel, Livingston, Patel, Villaveces, & Massetti, 2021; VanderEnde et al., 2018). However, no study has examined the prevalence of ACEs in multiple VACS countries using multi-country combined data. Therefore, the objectives of this paper were to report the prevalence of individual and cumulative ACEs in each of five sub-Saharan African countries (Lesotho, Mozambique, Namibia, Cote d'Ivoire and Namibia) individually and when pooled together in young adults aged 18–24 years by selected demographic and socioeconomic factors from the VACS data.

The intent of reporting ACEs in young adults and in sub-Saharan Africa in this study is that most ACEs literature focuses on adults and high-income countries. Sex disaggregated estimates are provided to establish prevalence of ACEs and inform programming and policy efforts to prevent ACEs and build resilience among exposed individuals.

1. Methods

1.1. Study design

VACS are nationally representative cross-sectional household surveys of female and males aged 13–24 years designed to yield population estimates of sexual, physical and emotional violence, as well as risk and protective factors for violence and associated health consequences (Massetti et al., 2020; Nguyen et al., 2019). This study, however, was restricted to only those 18–24 years of age. VACS use a standard core questionnaire, implement a multistage cluster sampling design and standard data collection methods for all countries. The three-stage sample design ensures that only one eligible participant is selected from each household and a split-sample is applied to guarantee that interviews are conducted with females and males separately in different enumeration areas. The survey systematically measures the prevalence, nature, and consequences of physical, sexual, and emotional violence (Chiang et al., 2016). In addition, the survey gathers information about several demographic indicators including age of the participant, education, employment, marital status, mental well-being, and several risk factors associated with violence. The survey includes a graduated consent process, a short household level questionnaire to build rapport with the family and to collect data on the status of existing household socioeconomic status, and a selected participant questionnaire (Nguyen et al., 2019). Data from the Cote d'Ivoire (2018), Kenya (2019), Lesotho (2018), Mozambique (2019), Namibia (2019) VACS were used for this study. Household and participant questionnaires are adapted for each country, led by local technical steering committees (Massetti et al., 2020). Data collection is conducted by

interviewers following an intensive training on survey protocols and procedures as well as best practices in survey implementation such as establishing rapport and ensuring privacy and safety to facilitate disclosure (CDC, 2019). Additional detailed information about protocol adaptation, methodology, and procedures for the Cote d'Ivoire (Ministry of Women, Family and Children of Côte d'Ivoire, 2019), Kenya (Ministry of Labour and Social Protection of Kenya, 2019), Lesotho (Ministry of Social Development of Lesotho, 2020), Mozambique (Instituto Nacional de Saúde (INS), 2022), and Namibia (Ministry of Gender Equality, Poverty Eradication and Social Welfare, 2020) are available in the full survey reports.

1.2. Participant selection

For all country VACS, participant selection was conducted using a multistage, geographically clustered samples. A predetermined number of enumeration areas were randomly selected from these geographically clustered regions in the country using probability proportion to size sampling. The number of enumeration areas required for the study in each country were determined by the available budget and desired precision during sample size calculation. A distinct number of households were randomly chosen from selected enumeration areas after mapping and listing were performed. One eligible participant was selected from each household for the interview. The sampling frame was the most up-to-date list of all primary sampling units in each country from which samples for the study were selected. The sampling frame was typically provided by the country statistics agency which compiles and maintains national census data. Table 1 included information about the sampling frame as well as details about the three-state cluster sample design, number of households and interviews completed, and response rates for each of the five VACS included.

Primary sampling units which had fewer than 100 households were excluded from selection to protect participants' confidentiality. In Lesotho, Namibia, and Mozambique VACS, pre-screening of households was done during mapping and listing to identify households with eligible residents for the second stage of sampling but no prescreening was conducted for the other two countries. For all countries, eligibility criteria included being male or female aged 13–24 years at the time of the study, living in the selected household, and speaking one of the survey languages (Table 1). Individuals were excluded if they resided outside the household (e.g., if they lived in an institution such as a hospital or prison) or had a severe mental or physical disability that would preclude participation in the interview independently. Interviews were conducted in a safe and private space to ensure confidentiality (CDC, 2017).

1.3. Ethical procedures

VACS utilized a three-stage graduated consent process, which included obtaining permission from the head of the household and

Table 1
Sampling information and response rates for the 2018 Cote d'Ivoire, 2019 Kenya, 2018 Lesotho, 2019 Mozambique, and 2019 Namibia Violence Against Children and Youth Surveys (VACS).

		Cote d'Ivoire	Kenya	Lesotho	Mozambique	Namibia
Sample size[a]	Female	1200	1344	7101	2129	4211
	Male	1208	788	1467	879	980
Sample size[b]	Female	703	691	3690	1248	2434
	Male	617	408	718	424	565
Household response rate (%)	Female	97.3	90.5	97.8	91.9	95.4
	Male	96.1	91.4	98.8	93.3	93.1
Individual response rate (%)	Female	95	81.7	98.3	87.5	92.8
	Male	91.2	72.8	98.0	86.9	90.4
Overall response rate (%)	Female	95	81.7	98.3	87.5	92.8
	Male	87.6	66.5	96.8	81.1	84.1
Pre-screening[c]		No	No	Yes	Yes	Yes
Number of survey languages		1	12	2	2	7
Survey language		French	Borana, Kalenjin, Kamba, Kikuyu, Kisii, Luo, Luhya, Maasai, Meru, Mijikenda, Swahili and Somali,	English, Sesotho	English, Portuguese	Afrikaans, English, Damara/ Nama, Oshiwambo, Otjiherero, Rukwangali, and Silozi
Number of Strata		11	89	10	38	13
Number of selected enumeration areas	Female	84	155	197	262	220
	Male	113	109	43	123	54
Number of households selected per enumeration areas		30	34	40	25	25
Sampling frame (total number of enumeration areas nationally		23,484	96,000	2600	45,283	3862

[a] Total sample size (all 13–24 year-olds).
[b] Sample size of 18–24 year-olds.
[c] Pre-screening during mapping and listing to exclude households that do not have respondents 13–24 years of age and who spoke one of the survey languages.

parent or caregiver consent for minor participants (followed by minor assent) or consent for adult participants and emancipated minors. Due to the sensitive nature of the survey, all consents, assents, and permissions were obtained verbally to reduce the chances of non-survey participant knowing the content of the survey which could lead to potential violence against participants. VACS protocols are consistent with the World Health Organization ethical recommendations for research on violence (WHO, 2016). All VACS study protocols were approved by both CDC and in-country Institutional Review Boards (IRB) for each country. IRB approval was waived for this secondary data analysis.

1.4. Measures

Items in the core VACS questionnaire were selected from well-established and commonly utilized survey tools with demonstrated validity and reliability. All country questionnaires were pilot tested to ensure appropriateness to the local context.

1.5. Adverse childhood experiences

The ACEs assessed in this study included the following experiences before age 18 years: 1) physical violence, 2) emotional violence, 3) sexual violence, 4) witnessing interparental violence, 5) witnessing violence in the community, and 6) orphan status. Items measuring ACEs in VACS were consistent across all countries and were selected from the ISPCAN Child Abuse Screening Tool-Retrospective (ICAST-R; for parent physical violence, and emotional violence; Dunne et al., 2009; Zolotor et al., 2009) and the Juvenile Victimization Questionnaire (JVQ; for peer, intimate partner, and adult physical violence, sexual violence, witnessing physical violence in the home, witnessing interparental violence, and witnessing violence in the community; Finkelhor, Ormrod, Turner, & Hamby, 2005; Pereda, Gallardo-Pujol, & Guilera, 2018). To assess orphanhood, participants were asked if one or both of their parents had died before age 18.

Physical violence included experiences such as having been slapped, pushed, shoved, shook, intentionally thrown something at, punched, kicked, whipped, beaten with an object, choked, smothered, intentionally burned, attempted drowning, attacked or threatened with a knife, and attacked or threatened with a gun by a parent or adult caregiver, an intimate partner, a peer, or an adult in the community. Emotional violence included being told by a parent or adult caregiver that one was not loved, that they wished one had never been born, or being ridiculed or put down. Sexual violence included unwanted sexual touching, attempted forced sex, pressured or coerced sex, and physically forced sex. Witnessing interparental violence included seeing or hearing one's mother or stepmother/ father or stepfather being punched, kicked, or beaten up by one's father or stepfather/ mother or stepmother, and witnessing community violence included seeing anyone get attacked outside of the home and family environment.

All ACEs were dichotomized based on whether a participant had ever experienced each ACE type before age 18. We also aggregated the ACEs into three groups: Experiencing violence (sexual violence, physical violence and emotional violence), witnessing violence (witnessing community violence and witnessing interparental violence), and orphanhood (Broekhof, Nordahl, Bjørnelv, & Selvik, 2022; Zuo et al., 2021). Endorsement of one or more items in an ACE group placed respondent into that domain. Domains were not mutually exclusive.

1.6. Demographics and covariates

VACS collect information about demographic and socio-economic indicators. Variables included in this study were age at the time of the study (18–21 and 22–24), educational status (primary school or less, secondary school or more), employment (ever received money for work in the past 30 days), marital status (married, never married) and food insecurity (ever experienced food insecurity).

1.7. Data analysis

This study included VACS participants ages 18–24 years in order to estimate the weighted prevalence of ACEs prior to age 18. All data were weighted to yield nationally representative estimates. This was achieved by accounting for the probability of each participant being in the sample (i.e., the base weight), and the survey non-response (non-response weight). The weights were adjusted so that the weighted totals within mutually exclusive classes (e.g., age groups) were equal to the known population totals (post-stratification weight) (Kolenikov, 2016). Data from each country were first analyzed separately and combined data from the five countries were used to provide combined estimates. Missing data for any of the variables included in the current study were <5 %, therefore, we used complete case approach to only include observations with complete data for any given analyses, however, missing data were used in the estimation of the variance.

We created a total ACE score ranging from 0 (no ACEs) to 6 (all ACEs), as well as a three-category aggregate score to include those who experienced no ACEs, 1–2 ACEs, and 3 or more ACEs. Additionally, the average ACE score among those who experienced at least one ACE was computed for each analytic group. Descriptive analysis was conducted to estimate frequencies, weighted prevalence, and 95 % confidence intervals (CIs) of all variables, including individual and combined ACEs and selected demographic characteristics for each country separately and for combined data, stratified by sex. Finally, adjusted Wald tests were conducted to determine the difference in average ACEs score between categories of the demographic variables in males and females. Pearson's chi-square test was used to assess whether ACEs differed by sex. For the aggregate ACE score, we created a dummy variable for each category of ACEs to examine the difference in ACE between males and females. Analysis of the combined data was conducted with each country's stratum and enumeration area variables and were assigned a unique suffix indicating which country the strata and the enumeration area

belonged. All statistical analyses were conducted using the statistical program STATA version 17 (StataCorp, 2021).

2. Results

2.1. Population characteristics

A combined total of 8766 females and 2732 males aged 18–24-year-olds were included in this study. They represented weighted frequency of 6,748,304 females and 6,343,229 males aged 18–24-year-olds. The female and male sample size for the countries included in this study ranged between 1099 in Kenya to 4408 in Lesotho (Table 1). As shown in Table 2, the proportion of 18–24-year-old young adult females who completed secondary school or more were 54.9 % (95 % CI = 51.4–58.4) and those who did not work for wages in the past 12 months were 70.0 % (95 % CI = 67.6–72.3) across the five countries. The proportion of females who were never married or cohabitated and those who experienced household food insecurity was estimated at 50.4 % (47.3–53.5) and 38.3 % (95 % CI = 35.2–41.4), respectively. Among males, 65.5 % (95 % CI = 62.7–68.2) had completed secondary school, 42.8 % (95 % CI = 39.2–46.6) did not work for wages in the past 12 months, and 81.5 % (95 % CI = 78.9–83.9) were never married or cohabitated. Food insecurity in males was 41.1 % (95 % CI = 37.5–44.8). Country specific estimates are provided in Table 2.

2.2. Adverse Childhood Experiences (ACEs) prevalence

The prevalence of ACEs was high among both females and males across the five countries included. The prevalence of experiencing at least one ACEs (i.e., 1–2 and 3+) was >72 % for both females and males (72.2 %, range for the five countries (68.8–78.6) in females and 81.8 %, range for the five countries (79.6–87.1) in males; Appendix A and Table 3). Across the five countries, the prevalence of

Table 2
Selected background characteristics in males and females 18–24-years-old: Cote d'Ivoire, Kenya, Lesotho, Mozambique and Namibia Violence Against Children and Youth Surveys (VACS).

		Younger Age (18–21)[a] *n* *% [95 % CI]*	Completed secondary school+ *n* *% [95 % CI]*	Not employed[b] *n* *% [95 % CI]*	Never Married or Cohabitated[c] *n* *% [95 % CI]*	Experienced food insecurity[d] *n* *% [95 % CI]*
Females	Cote d'Ivoire	703 60.1[53.9–66.0]	703 46.4[37.5–55.5]	703 66.9 [61.8–71.7]	700 53.9[45.3–62.2]	702 44.3[35.1–54.0]
	Kenya	691 61.8[57.1–66.4]	691 66.6[61.4–71.4]	691 66.4 [62.5–70.2]	672 62.7[58.3–66.8]	688 22.1[18.4–26.2]
	Lesotho	3690 61.8[59.6–64.0]	3676 79.8[76.9–82.3]	3684 74.5 [72.3–76.6]	3688 61.5[58.3–64.6]	3657 66.0[63.6–68.3]
	Mozambique	1248 64.5[60.6–68.2]	1247 35.8[31.2–40.8]	1248 80.0 [76.0–83.5]	1247 22.2[17.9–27.2]	1228 59.4[54.8–63.8]
	Namibia	2434 62.2[59.0–65.3]	2420 97.7[96.4–98.6]	624 6.3[3.4–11.3]	2402 90.1[88.3–91.6]	2351 52.2[48.5–55.8]
	Combined	8766 62.1[59.4–64.8]	8737 54.9[51.4–58.4]	6950 70.0 [67.6–72.3]	8709 50.4[47.3–53.5]	8626 38.3[35.2–41.4]
Males	Cote d'Ivoire	617 62.6[58.0–66.9]	617 63.5[57.3–69.3]	617 48.2[41.5–55]	614 84.1[79.3–87.9]	614 51.3[45.0–57.5]
	Kenya	408 66.9[58.0–74.7]	408 74.4[70.3–78.2]	408 39.4 [33.4–45.8]	403 90.8[88.5–92.7]	407 26.3[19.4–34.6]
	Lesotho	718 62.6[58.7–66.3]	718 68.4[61.8–74.4]	717 63.4 [58.6–67.9]	718 89.8[86.4–92.5]	714 70.4[64.1–76.0]
	Mozambique	424 61.0[54.9–66.7]	424 44.2[37.8–50.7]	423 44.9 [39.1–50.9]	424 56.6[48.9–63.9]	422 58.5[51.6–65.0]
	Namibia	565 67.0[61.2–72.4]	564 95.9[93.4–97.5]	257 3.6[1.4–9.1]	555 95.8[94.0–97.0]	547 63.1[55.3–70.2]
	Combined	2732 64.5[60.0–68.7]	2731 65.5[62.7–68.2]	2422 42.8 [39.2–46.6]	2714 81.5[78.9–83.9]	2704 41.1[37.5–44.8]

[a] Age has two categories (18–21 and 22–24).
[b] Did not receive money for work in the past 12 months.
[c] Never married or lived with someone as if married.
[d] The household does not have enough money for food.

experiencing no ACEs among females ranged between 21.4 %(95 % CI = 16.4–27.5) in Cote d'Ivoire and 31.2 % (95 % CI = 26.6–36.3) in Mozambique and males ranged between 12.8 % (95 % CI = 9.3–17.5) in Lesotho and 20.4 % (95 % CI = 14.5–28.0) in Namibia, with a combined total of 27.9 % for females (95 % CI = 25.0–30.9) and 18.1 % for males (95%CI = 14.7–22.2) (Table 3 and Appendix A). There was a statistically significant difference in the combined estimate between females and males who experienced no ACEs ($p < 0.001$) (Table 3). The combined prevalence of experiencing 1–2 ACEs and three or more ACEs for females was 52.7 % (95 % CI = 49.7–55.6) and 19.5 % (95 % CI = 17.4–21.7) respectively, and for males was 57.6 % (95 % CI = 53.9–61.3) and 24.2 % (95 % CI = 20.5–28.3) respectively. In the combined data, no statistically significant difference was observed in the average ACEs score between females and males when only those who experienced at least one ACE were considered (2.0 [95 % CI = 1.9–2.1] in females and 2.0 [95 % CI = 1.9–2.1] in males) (Table 3).

Among females, the prevalence of physical violence was 36.5 % (95 % CI = 33.8–39.2) and it was 49.7 % (95 % CI = 45.5–53.9) in males (Table 3 and Appendix A). Sexual violence was 16.0 % (95 % CI = 13.9–18.2) in females and 8.0 % (95 % CI = 6.2–10.2) in males. The prevalence of emotional violence, witnessing interparental violence, and witnessing community violence in females were 9.2 % (95 % CI = 7.6–11.0), 23.6 % (95 % CI = 21.2–26.2) and 37.2 % (95 % CI = 34.3–40.1), respectively. In males on the other hand, the prevalence of emotional violence was 7.7 % (95 % CI = 5.9–10.0), witnessing interparental violence was 21.5 % (95 % CI = 18.5–24.9) and witnessing community violence was 55.0 % (95 % CI = 51.1–58.8) across the five countries. The prevalence of orphanhood among females was 25.2 % (95 % CI = 22.6–28.0) and this value for males was 24.1 % (95 % CI = 21.5–26.9). As shown in Table 3, females experience significantly higher prevalence of sexual violence than males (16.0 % vs 8.0 %, $p < 0.001$) whereas males experience significantly higher prevalence of physical violence (49.7 % vs 36.5 %, $p < 0.001$) and witnessing violence in the community (55.0 % vs 37.2 %, $p < 0.001$). There were also some differences noted in individual ACEs by country and sex (Appendix A).

In the combined analysis, the prevalence of 1 or more ACEs was 44.8 % in 18–21-year-olds (i.e., 1–2 ACEs = 32.8 % and 3+ ACEs = 12.0 %) and 27.4 % in 22–24 year old females whereas it is 53.3 % and 28.5 % in males (Table 4). There was a statistically significant difference in the average ACE score in males between 18 and 21 and 22–24-year-olds with the younger age group having higher mean ACE score (2.1[95 % CI = 2.0–2.2] and 1.9[95 % CI = 1.7–2.0], $p < 0.05$) (Table 4). Although there was a variation in the proportion of each ACEs category between the categories of education status, the average ACEs score was similar in educational status in both males and females, i.e., 2.0 (95 % CI = 1.9–2.1). The prevalence of 1 or more ACEs was 36.5 % in females who were married or cohabitating and 35.8 % in those who were not married or cohabitating. In males, 14.5 % of married individuals experienced 1 or more ACEs whereas 67.2 % of never married or cohabitating males experienced 1 or more ACEs. Regarding employment status in the past 12 months, the prevalence of 1 or more ACEs was 23.8 % in employed females and 48.3 % in those who were not employed. In males, the prevalence was 49.2 % and 32.6 % in employed and not employed, respectively. No statistically significant difference was observed in the average ACEs score when comparing marital status, employment status and educational status both in males and females.

In females, the average ACEs score was 2.0 (95 % CI =1.8–2.1) in those who experienced food insecurity and 1.9 (95 % CI = 1.9–2.0) in those who did not have food insecurity. There was a statistically significant difference in average ACE score in males between those who experience food insecurity and those who did not (2.1 [95 % CI = 2.0–2.2] vs 1.9[95 % CI = 1.8–2.0], $p < 0.05$) (Table 4).

2.3. Overlap of ACEs

The Venn diagrams in Fig. 1 show overlaps between the three ACE groups. In the combined data, 18.5 % of females (95 % CI = 15.5–21.4) and 16.4 % of males (95 % CI = 12.2–20.6) experienced only abuse whereas 20.6 % of females (95 % CI = 25.4–31.0) and 21.2 % of males (95 % CI = 17.8–24.7) only witnessed violence. Among females, 10.1 % (95 % CI = 95 % CI = 8.4–11.7) and among

Table 3
Prevalence of ACEs in males and females 18–24-years-old: combined data of Cote d'Ivoire, Kenya, Lesotho, Mozambique and Namibia Violence Against Children and Youth Surveys (VACS).

	Females		Males		*p value*[c]
	n	% [95 % CI][b]	n	% [95 % CI]	
Multiple ACEs					
None	8757	27.9[25–30.9]	2731	18.1[14.7–22.2]	<0.001
1–2	8757	52.7[49.7–55.6]	2731	57.6[53.9–61.3]	0.06
3+	8757	19.5[17.4–21.7]	2731	24.2[20.5–28.3]	0.05
Average ACEs Score[a]	6469	2.0[1.9–2.1]	2232	2.0[1.9–2.1]	0.94[d]
Individual ACEs					
Physical violence	8729	36.5[33.8–39.2]	2714	49.7[45.5–53.9]	<0.001
Sexual violence	8751	16.0[13.9–18.2]	2730	8.0[6.2–10.2]	<0.001
Emotional violence	8628	9.2[7.6–11.0]	2676	7.7[5.9–10.0]	0.343
Witnessed interparental violence	8620	23.6[21.2–26.2]	2677	21.5[18.5–24.9]	0.395
Witnessed physical violence in the community	8674	37.2[34.3–40.1]	2697	55.0[51.1–58.8]	<0.001
Orphaned (one or both parents died	8176	25.2[22.6–28]	2613	24.1[21.5–26.9]	0.634

[a] Average ACE score among those who experienced at least one ACE.
[b] Weighted percent and 95 % confidence interval.
[c] Chi-square test *p*-value.
[d] Determined by Wald test.

Table 4
Prevalence of ACEs by selected demographic characteristics among females and males 18–24 years of age: combined data of Lesotho, Kenya, Cote d'Ivoire, Mozambique and Namibia Violence Against Children and Youth Surveys (VACS).

	Females ($N = 8757$)							Males ($N = 2731$)						
		ACEs							ACEs					
	n	None	1–2	3+	1+	Mean ACEs Score[a] [95 % CI]	p value[d]	n	None	1–2	3+	1+	Mean ACEs Score [95 % CI]	p value
Age														
18–21	5363	17.4 [15.1–19.9]	32.8 [30.2–35.5]	12 [10.3–13.9]	44.8 [41.8–47.8]	2.0[1.9–2.1]	0.57	1710	11.2 [8.1–15.1]	36.4 [32.9–40.0]	16.9 [13.6–20.9]	53.3 [48.4–58.2]	2.1[2.0–2.2]	<0.05*
22–24	3394	10.5 [8.9–12.4]	19.9 [18.0–21.9]	7.5[6.2–9.0]	27.4 [25.1–29.7]	1.9[1.8–2.0]		1021	7.0[5.6–8.6]	21.2 [18–24.9]	7.3[5.5–9.5]	28.5 [24.3–33.1]	1.9[1.8–2.0]	
Educational status[a]														
Primary or less	2362	13.8 [11.8–16.0]	22.9 [20.7–25.3]	8.4 [6.7–10.4]	31.3 [28.4–34.4]	1.9[1.8–2.1]	0.92	899	7.6[6.1–9.5]	19.1 [17.0–21.5]	7.7[6.4–9.3]	26.8 [24.5–29.3]	2.0[1.8–2.1]	0.99
Secondary or more	6375	14.1 [12.0–16.6]	29.7 [26.9–32.7]	11.1 [9.6–12.7]	40.8 [37.5–44.1]	2.0[1.9–2.1]		1832	10.5 [7.6–14.4]	38.5 [34.8–42.4]	16.5 [13.4–20.2]	55 [51.4–58.6]	2.0[1.8–2.1]	
Marital status														
Married	3438	13.1 [11.4–14.9]	25.7 [23.5–28.0]	10.8 [9.1–12.8]	36.5 [33.8–39.4]	2.0[1.9–2.2]	0.24	490	3.9[3.0–5.2]	10.5 [8.8–12.4]	4.1[3.1–5.4]	14.5 [12.5–16.9]	2.0[1.9–2.2]	0.99
Never married or cohabitated	5271	14.6 [12.4–17.2]	26.9 [24.0–30.0]	8.9 [7.5–10.5]	35.8 [32.7–39.0]	1.9[1.8–2.1]		2224	14.3 [11.1–18.2]	46.9 [43.4–50.5]	20.3 [16.8–24.4]	67.2 [62.2–71.4]	2.0[1.9–2.1]	
Employment status[b]														
Employed	2213	6.2[5.0–7.7]	16.9 [14.9–19.1]	6.9[5.7–8.3]	23.8 [21.6–26.2]	2.0[1.8–2.1]	0.65	1316	7.9 [5.9–10.6]	33.4 [29.8–37.2]	15.8 [12.3–20.1]	49.2 [45.5–53.0]	2.1[1.9–2.2]	0.16
Not employed	4737	21.7 [19–24.7]	35.8 [33.0–38.6]	12.5 [10.9–14.4]	48.3 [45.3–51.3]	1.9[1.8–2.1]		1106	10.2 [8.0–12.8]	24.2 [20.9–27.8]	8.5 [6.9–10.4]	32.6 [29.1–36.4]	1.9[1.8–2.0]	
Food insecurity[c]														
Yes	5041	9.9 [8.6–11.4]	20.2 [18.4–22.2]	8.1 [6.4–10.2]	28.3 [25.6–31.3]	2.0[1.8–2.1]	0.57	1500	7.7 [5.7–10.5]	21.7 [19.3–24.2]	11.7 [8.9–15.4]	33.4 [29.6–37.5]	2.1[2.0–2.2]	<0.05*
No	3585	17.9 [15.5–20.7]	32.5 [29.6–35.4]	11.3 [9.9–13.0]	43.8 [40.8–46.9]	1.9[1.9–2.0]		1204	10.4 [8.5–12.7]	35.9 [32.6–39.4]	12.5 [10.6–14.7]	48.4 [44.8–52.1]	1.9[1.8–2.0]	

Note: *significant at $p < 0.05$ level.
[a] Completed primary school or less/ completed secondary school or more.
[b] Received money for work in the past 12 months.
[c] The household does not have enough money for food.
[d] Determined by adjusted Wald test between weighted average ACEs scores.

males, 5.6 % (95 % CI = 3.9–7.2) were orphans but did not experience or witness any violence. On the other hand, 28.2 % of females (95 % CI = 25.4–31.0) and 33.9 % of males (95 % CI = 30.0–37.7) both experienced violence and witnessed violence. In addition, 7.3 % of females (95 % CI = 5.5–9.2) and 6.5 % of males (95 % CI = 4.6–8.3) were orphans and witnessed violence. The prevalence of orphanhood and experiencing violence was 6.4 % in females (95 % CI = 5.2–7.6) and 3.5 % (95 % CI = 2.3–4.7) in males. The prevalence of experiencing all the three ACEs groups was 9.0 % in females (95 % CI = 7.0–10.9) and 13.0 % in males (95 % CI = 11.0–14.9). The prevalence of possible scenarios of overlap between the six ACEs is shown in Appendix B (prevalence below 1 % are

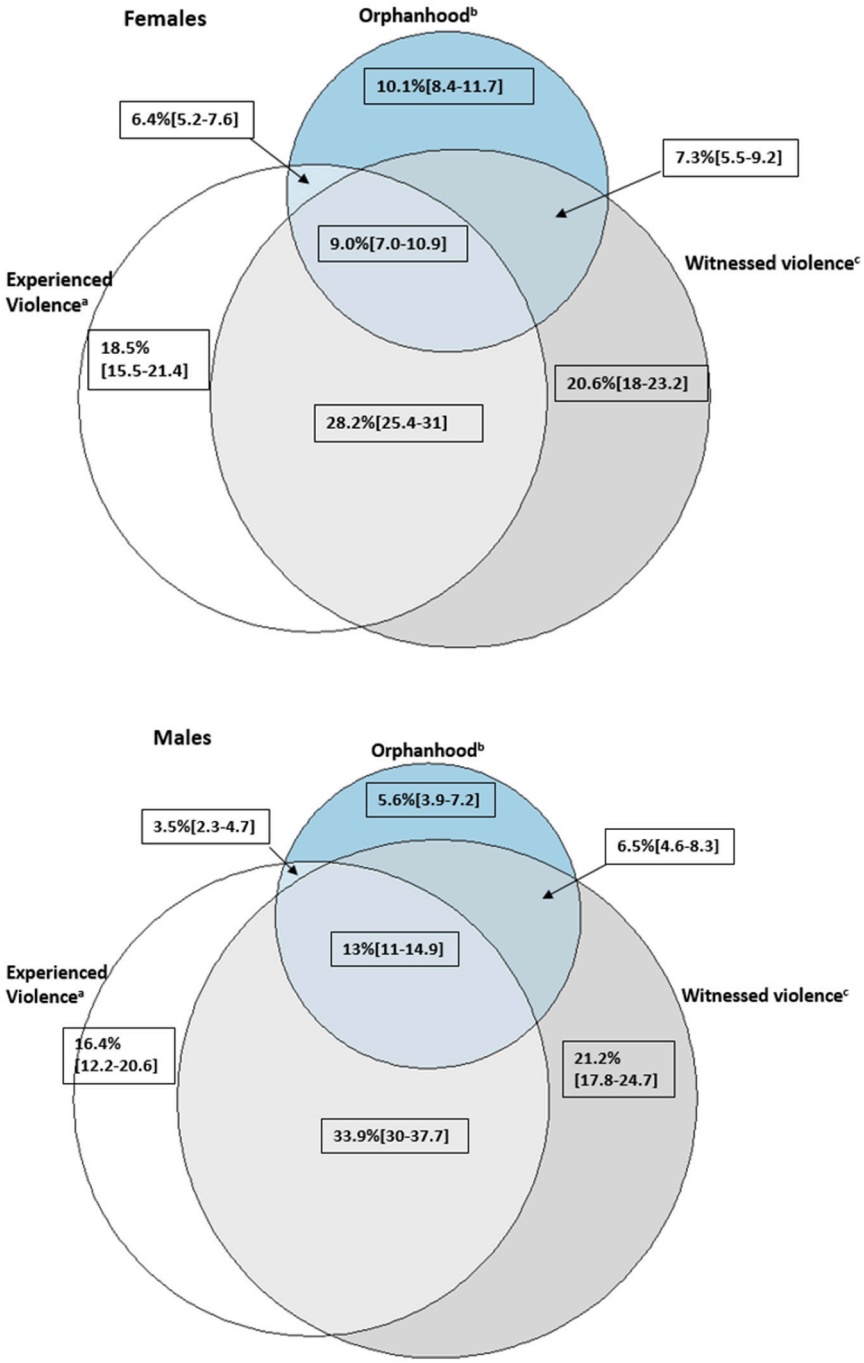

Fig. 1. Overlap of three groups of adverse childhood experiences (ACEs) in 18–24-year-old females (top) and males (bottom) from Cote d'Ivoire, Kenya, Lesotho, Mozambique, and Namibia, Violence Against Children and Youth Surveys.
[a] Experienced violence: includes physical violence, sexual violence or emotional violence; [b] Orphanhood: lost one or both parents [c] Witnessed physical violence in the community and/or interparental violence. Numbers in brackets are weighted 95 % confidence intervals.

not shown).

3. Discussion

This large-scale prevalence study of ACEs in sub-Saharan Africa is the first to document population prevalence of ACEs among young adults in Cote d'Ivoire, Kenya, Lesotho, Mozambique, and Namibia. Several previous reports have documented that ACEs are common in low and middle income countries in Africa (Craig et al., 2022; Lee, Massetti, Perry, & Self-Brown, 2022; VanderEnde et al., 2018). The results of this study demonstrated that having experienced one or more ACEs is common in young adults in low and middle income countries in sub-Saharan Africa. The study also underlined that ACEs tend to co-occur in the population of young adults which agrees with other studies (Bussemakers, Kraaykamp, & Tolsma, 2019). Variations across countries in ACEs prevalence – for both individual ACEs and for any ACEs and total ACEs – could be due to differences in cultural and socioeconomic drivers and socio-cultural risk and protective factors for ACEs (Thi, Zimmerman, Pocock, Chan, & Ranganathan, 2022). Overall, the most common type of ACEs in both females and males was witnessing physical violence in the community (females: 37.2 % [95 % CI, 34.3–40.1] and males: 55.0 % [95 % CI, 51.1–58.8]. This agrees with other studies that had reported that witnessing physical violence was among the most common ACE in similar age groups (Kappel et al., 2021). The overall prevalence of exposure to one or more ACEs was higher in males than in females in all countries considered in this study. This higher prevalence in males could be due to the high prevalence of physical violence and witnessing physical violence in the community in males. While the prevalence of physical violence and witnessing community violence was higher among males, the prevalence of sexual violence was higher among females. These findings are consistent with previous studies (Borumandnia, Khadembashi, Tabatabaei, & Alavi Majd, 2020; Chwo et al., 2022; Diamond-Smith & Rudolph, 2018). Although sexual violence is likely underreported in both men and women due to the sensitive nature of the problem, the higher prevalence of sexual violence in females can be related to lower levels of educational attainment where less educated women report more violence as compared to their counterparts (Kundapur, Shetty, Kempaller, Kumar, & Anurupa, 2017). The higher prevalence of sexual violence may also be related to the experience of intimate partner violence among females (Mthembu, Mabaso, Reis, Zuma, & Zungu, 2021). In addition, low socioeconomic status in females may independently contribute to high prevalence of sexual violence in females (Runarsdottir, Smith, & Arnarsson, 2019). Another consideration is that the prevalence of sexual violence may not actually be lower in men, rather it may have been underreported due to gender norms and attitudes coupled with cultural attributes (Shumba, 2004). Similar to findings from other reports, this study also found that there is greater vulnerability of orphans in both females and males to several types of ACEs including physical violence, witnessing physical violence in the community and/or interparental violence (Seidel, Chang, Mwongera, Gitari, & Goodman, 2017) (Fig. 1). The findings of this study showed some variation in the prevalence of ACEs by employment and marital statuses among both males and females. These differences, however, were not statically significant when the average ACEs score among those who experience at last one ACE was considered. This result is not consistent with previous studies that found that ACEs have impact regarding employment success (Currie & Widom, 2010; Zielinski, 2009). Our employment status indicator only represents the duration of 12 months prior to the survey so this observation could well be related to the characteristics of those that worked and those that did not that could be related to ACEs. Almost half of female participants in this study were married compared to 20 % of males therefore may have been less likely to enter the workforce (Janse van Rensburg, Claassen, & Fourie, 2019).

Although not statistically significant in females, the average ACEs score in males was significantly higher in those who reported experiencing food insecurity compared to those who did not. These findings agree with other studies where ACEs had been documented to be antecedent to food insecurity in young adulthood (Royer et al., 2022; Sun et al., 2016; Testa & Jackson, 2020). It is important to note that the instrument in the current study asked participants whether they have enough money to buy food as a proxy measure for food insecurity. However, food insecurity may be experienced differently at the household, adult, and child levels so it may only have captured a short-term challenge and not been reflective of the overall socioeconomic status of the participants (Frongillo, Rauschenbach, Olson, Kendall, & Colmenares, 1997).

A strength of this study was that data from multiple countries were collected in a similar design allowing for comparisons to be made between countries and data to be pooled across countries. On the other hand, ACEs prevalence in this study was estimated based on self-reported experiences in childhood, and it is possible that respondents may have provided socially acceptable or false answers although standard safety protocol was put in place to minimize fear of disclosure. Since ACEs occurred in the past, it is also possible that participants may have difficulty remembering all the events and hence the event may be under-reported. However, a strength of this study is that participants were youth, so less likely to have issues with recall than adults who are much further out from their childhood experiences.

4. Conclusion

This study demonstrates the high prevalence and overlap of ACEs in low and middle income countries in sub-Saharan Africa. The estimates from the current study are higher than reports from other global studies using data from high-income, middle-income, and low-income countries (Kessler et al., 2010). Variations between countries may be reflective of differences across cultures and norms and warrant further investigation. Furthermore, this study underlines that a majority of youth in the surveyed countries have experienced one or more ACEs. Given the high prevalence, further studies on the associations between ACEs and health outcomes and economic indicators would be beneficial. Early interventions to reduce childhood exposure to adversities or to mitigate their effects are critical to reduce the myriad of documented long-term consequences of ACEs later in their life.

Data availability

Data will be made available on request.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2023.106353.

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