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ORIGINAL ARTICLE

Intimate Partner Violence among Mothers of Children with Sickle Cell Disease: A Retrospective Cohort Analysis of 2018 Nigeria DHS Data

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ABSTRACT

Background: The 2018 Nigeria Demographic and Health Survey (NDHS) collected data on the experience of intimate partner violence (IPV) among women aged 15-49 years and the genotype of their children aged 6-59 months. We performed a retrospective cohort analysis to ascertain if having a child with sickle cell disease (SCD) predisposes women to IPV.

Methods: Eighty-five mothers of children living with SCD were compared with 320 mothers of children living without SCD after matching for age, number of living children, religion, place of residence and wealth index. The prevalence rates of IPV and the relative risks (RRs) of experiencing controlling behaviour, emotional, physical, sexual and any form of IPV in the 12 months preceding the survey were calculated.

Results: Compared to mothers of children without SCD, mothers of children living with SCD were not at greater risk of experiencing controlling behaviour (RR=0.90, 95% CI: 0.54–1.49), emotional violence (RR=1.09; 95% CI=0.78–1.53), physical violence (RR=0.75, 95% CI: 0.38–1.48), sexual violence (RR=0.89, 95% CI: 0.31–2.56) or any form of IPV (RR=0.98, 95% CI: 0.71–1.37).

Conclusion: The study did not find sufficient evidence for increased risk of IPV among mothers of children living with SCD, despite the additional health, psychosocial and financial burdens associated with raising a child with the disease. Further research is needed to address the limitations of this study and to carefully investigate the relationship between having a child with SCD and the experience of IPV among women.

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INTRODUCTION

According to the World Health Organization, intimate partner violence (IPV) refers to "any behaviour within an intimate relationship that causes physical, psychological or sexual harm to those in the relationship".[1] The overwhelming burden of IPV is borne by women, who often suffer health and economic consequences.[1] Apart from physical, sexual and emotional violence that are commonly reported in the literature, women often suffer other forms

of IPV, such as economic or financial violence and controlling behaviour from their partners.[2,3]

In 2018, an estimated 13% of all ever-married or partnered women of reproductive age experienced physical and/or sexual violence worldwide.[4] The majority of those women were in sub-Saharan Africa and Oceania.[5] In Nigeria, the 2018 National Demographic and Health Survey (NDHS) reported that about 30% of all ever-married women of reproductive age experienced physical, sexual or emotional violence in the 12 months preceding the survey.[6]

Sickle cell disease (SCD) is a generic name for a group of hereditary disorders that are characterized by the presence of abnormal red cells in blood, leading to diverse clinical manifestations of the disease. It is one of the leading causes of childhood mortality worldwide with mortality estimates ranging from 0.11 deaths per 100 child-years of observation in Europe to 7.30 per 100 child-years in Africa.[7] In Nigeria, the commonest forms of SCDs are sickle cell anaemia (HbSS) and haemoglobin C disease (HbSC).[8] According to the 2018 NDHS, about 1% of all children aged 6-59 months in Nigeria have sickle cell anaemia.6 However, due to a large population size, an estimated 100,000 Nigerian children die each year as a result of the disease and its complications.[8]

Studies have shown that parents and caregivers of children with SCD face a number of financial, health and psycho-social challenges. Such challenges may be in the form of increased family spending on health, loss of productivity, disruption of routine activities and diminished overall quality of life.[9–14] According to the social-ecological model (SEM) of violence, certain individual, situational and community-level factors that include unemployment, poverty, marital conflicts and rigid gender roles may predispose women to violence.[15, 16]

This study aimed to ascertain, using data from the 2018 NDHS, if mothers of children living with SCD were at greater risk of experiencing IPV compared to mothers of children living without SCD. We hypothesized that mothers of children living with SCD may be at greater risk of experiencing IPV, especially if they are blamed for giving birth to sick children or if they are accused of not providing adequate care. They may be predisposed to IPV if family members feel neglected or are unable to cope with the stress associated with raising a sick child (displaced aggression). Such mothers may also be targeted if the healthcare expenditure due to the child's condition leads to household poverty. Figure 1 summarizes the key arguments in our hypothesis and illustrates a vicious cycle that may arise if caring mothers become victims of IPV.

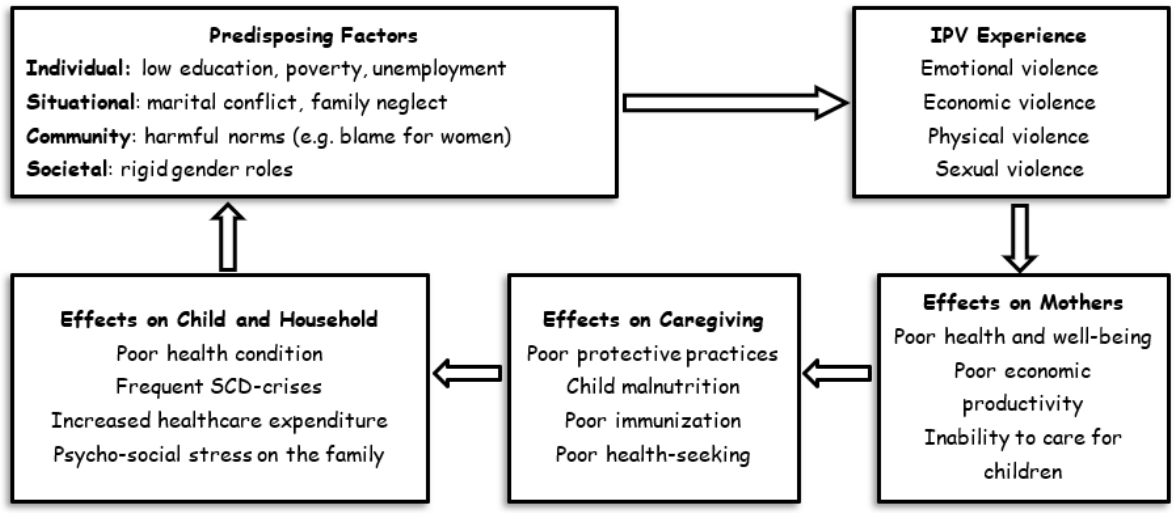

Figure 1. Conceptual framework showing the predisposing factors to intimate partner violence based on the social-ecological model (Heise, 1998)

The social-ecological model theorized that certain adverse individual, situational, community and societal factors predispose women to violence, which could affect their health and well-being and in turn, their ability to provide adequate care and preventive practices to their children. The adverse consequences of IPV on a child living with SCD may include worsening of health status, frequent crises and increased health expenditure, which further exacerbates household poverty and sets a vicious cycle of IPV.

METHODOLOGY

This is a retrospective cohort study that compared the risk of IPV between mothers of children living with SCD and mothers of children living without SCD. The data was obtained from the 2018 NDHS, a nationally representative survey of 40,427 households in Nigeria.[6] The survey was one of the largest in Africa and the first national population-based survey to include sickle cell genotyping of children.[17] The outcomes of the survey, including the 2018 NDHS final report and a number of carefully-organized datasets were published by the DHS Program in collaboration with local agencies. One of the datasets, the individual recode file, contained a Domestic Violence (DV) module while another dataset, the persons recode file, contained results of sickle cell genotyping among a selected number of children aged 6-59 months.

Cohorts

Two cohorts, the exposed and the unexposed cohorts were considered in this study. The exposed cohort comprised women aged 15-49 years who had at least one living child, aged 6-59 months, who was diagnosed with any of the SCDs during the 2018 NDHS. The unexposed cohort comprised women aged 15-49 years who had children aged 6-59 months, but without any of the SCDs. Women in the exposed cohort were identified through their line numbers contained in the data for children diagnosed with SCDs in the persons recode file. Although a total of 145 children were diagnosed with SCDs during the survey, only 85 mothers could

be identified and included in the analysis due to several reasons outlined in Figure 2.

Women in the unexposed cohort were selected from a total of 10,677 women whose records appeared in the Domestic Violence module. The IBM SPSS Statistics software was used to select those women in a ratio of 1:4, after matching for key socio-demographic variables that included age (±2 years), number of living children, religion, place of residence and wealth index. The selection was done without replacement and with preference given to the best-matched cases. However, for 20 women in the exposed cohort, only 3 matched unexposed women could be identified by the software, thereby returning a total of 320 (instead of 340) women in the unexposed cohort. Altogether, 405 women were included in the analysis, comprising 85 exposed and 320 unexposed women.

Study Variables

The independent variable in this study was having a child aged 6-59 months diagnosed with any of SCDs during the survey. The 2018 NDHS used a rapid diagnostic test (SickleSCAN®) to identify children with SCDs. A confirmatory test using high-performance liquid chromatography (HPLC) was carried out on 25% of blood samples for validation.[17] The dependent variables consisted of four types of IPV, namely: emotional violence, physical violence, sexual violence and controlling behaviour experienced in the 12 months preceding the survey. For controlling behaviour, a timeframe was not specified. A fifth dependent variable, experience of any type of IPV in the 12 months preceding the survey was created by adding the scores for emotional, physical and sexual violence.

Per the 2018 NDHS protocol, IPV was diagnosed using a series of questions. Three questions were used to screen for emotional violence, whereas seven questions were used to diagnose physical violence. In the case of sexual violence, three questions were used to identify victims.[6] For each type of IPV, only one "yes" answer was necessary to make a positive diagnosis. For controlling behaviour, five questions were asked in the survey. In this study, a respondent was classified as victim of controlling behaviour if she experienced at least three of the five controlling behaviours.

Statistical Analysis

Statistical analysis was performed using IBM SPSS Statistics software version 25.0 (IBM SPSS, Chicago, US). Chi-square test and independent sample t-tests were used to ascertain comparability between the exposed and unexposed cohorts. A *p*-value less than 0.05 was considered statistically significant to reject the null hypotheses. The measure of association used was relative risk (RR), defined as the ratio of the past-year prevalence of IPV among the exposed women to the past-year prevalence of corresponding IPV among the unexposed women. Ninety-five percent confidence intervals (95% CIs) were calculated for each RR and were considered statistically significant if they did not contain unity.

Ethical Considerations

The 2018 NDHS survey protocol was reviewed and approved by the National Health Research Ethics Committee of Nigeria (NHREC) and the ICF Institutional Review Board.[6] Access to the datasets and permission to proceed with the study were obtained from the DHS Program. All the datasets are freely available upon reasonable request to the DHS Program.

Table 1: Sociodemographic characteristics of women in exposed and unexposed cohorts (n=405)

Variable	Exposed cohort n (%)	Unexposed cohort n (%)	Test	Statistic	*p*-value
Place of residence					
Urban	35 (22.3)	122 (77.7)	χ^2	0.263	0.608
Rural	50 (20.2)	198 (79.8)			
Religion*					
Islam	49 (20.2)	193 (79.8)	χ^2	0.119	0.942
Catholic	8 (22.2)	28 (77.8)			
Other Christian	27 (21.4)	99 (78.6)			
Wealth index					
Poorest	14 (20.6)	54 (79.4)	χ^2	0.243	0.993
Poorer	17 (21.3)	63 (78.8)			
Middle	21 (21.0)	79 (79.0)			
Richer	12 (22.6)	41 (77.4)			
Richest	20 (19.4)	83 (80.6)			
Mean age (SD)	29.2 (5.7)	29.3 (5.4)	t-test	0.086	0.931
Mean parity (SD)	3.3 (1.8)	3.4 (1.8)	t-test	0.402	0.688

t-test = independent sample
SD = Standard Deviation
Parity = number of living children
*Based on 404 cases as one exposed case, a traditionalist, was not included

RESULTS

Table 1 compared the women in the exposed and the unexposed cohorts, based on the matched socio-demographic variables. The mean age of the women in the exposed cohort (M=29.2, SD=5.7) was not significantly different from the mean age of the women in the unexposed cohort (M=29.3, SD=5.4) (t_{403}=0.086, p=0.931). Likewise, both cohorts had similar proportions of urban-dwelling women (22.3% versus 20.2%, χ^2=0.263, p=0.608). As shown in Table 1, the average number of living children and the distributions of religion and wealth among women in the two cohorts were not significantly different.

Table 2 shows the past-year prevalence of all types of IPV along with their RRs and 95% CIs. The risk of experiencing at least three controlling behaviours among women in the exposed cohort (17.6%) was not significantly different from that among women in the unexposed cohort (19.7%) (RR=0.90, 95% CI: 0.54–1.49). Likewise, the risk of experiencing any type of IPV among women in the exposed cohort (34.1%) was not significantly different from that among women in the unexposed

cohort (34.7%) (RR=0.98, 95% CI: 0.71–1.37). There was no statistically significant difference in the risk of emotional, physical or sexual violence among women in the exposed cohort compared to women in the unexposed cohort as shown in Table 2.

Table 2: Past-year prevalence and relative risk of experiencing IPV among exposed and unexposed cohorts (n=405)

Violence	Exposed cohort n=85	Unexposed cohort n=320	Relative Risk	95% CI
Controlling behaviour	15 (17.6%)	63 (19.7%)	0.90	0.54 – 1.49
Emotional violence	29 (34.1%)	100 (31.3%)	1.09	0.78 – 1.53
Physical violence	9 (10.6%)	45 (14.1%)	0.75	0.38 – 1.48
Sexual violence	4 (4.7%)	17 (5.3%)	0.89	0.31 – 2.56
Any type of violence*	29 (34.1%)	111 (34.7%)	0.98	0.71 – 1.37

*Controlling behaviour was not included

DISCUSSION

The inclusion of genotyping in the 2018 NDHS provided a good opportunity to study the relationship between SCDs among children and the experience of IPV among their mothers. This study would have been impossible before 2018, since previous demographic and health surveys did not collect any data on genotyping. The 2018 NDHS identified 145 children aged 6-59 months with SCDs (about 1% of all children in that age group).[17] In a previous study, a higher estimate (2% of all live births in Nigeria) was reported.[18] Prevalence estimates for SCDs are likely to decrease with the increasing age of the population due to higher mortality associated with the disease.

In this study, we observed that the risks of experiencing controlling behaviour among women in the exposed and unexposed cohorts were not significantly different. Likewise, the proportions of women who experienced at least three controlling behaviours by their husbands (or partners) in both cohorts were not significantly different from the 17.6% reported in the 2018 NDHS.[6] Controlling behaviours are "actions designed and intended to make a person subordinate or dependent by isolating them from sources of support, exploiting their resources for personal gains, depriving them of means, and regulating their everyday behaviour".[19] Women subjected to controlling behaviour live in fear, alarm and distress, causing a substantial adverse effect on their daily activities. In previous studies, strong associations between certain types of controlling behaviour and other types of IPV were reported.[20, 21]

Regarding the risk of emotional violence, we found no significant difference between the two cohorts. Although the past-year prevalence of emotional violence among women in the exposed cohort was higher than the 26.7% reported in the 2018 NDHS, the difference may

be a random error which could have resulted from the limited sample size used in this study. It is also likely that women in the exposed cohort differed systematically from the women in the general survey, as SCDs are not uniformly distributed across the country.[17] Regardless of these differences, emotional violence remains the most widespread and pervasive form of IPV, with some studies describing it as more damaging to women than physical or sexual violence.[22, 23]

The past-year prevalence of physical, sexual and any type of IPV estimated in this study closely approximated the 11.8%, 4.7% and 29.5% reported in the 2018 NDHS respectively.[6] There was no statistically significant difference in the risk of either physical, sexual or any type of IPV between the two cohorts. While these findings failed to support our hypothesis, they highlighted the complex and multifaceted nature of the aetiological factors associated with IPV.

A number of reasons may explain why our study found no significant difference in the risk of IPV among women in the two cohorts. For instance, because SCD measurements were taken among young children, it is likely that the parents included in this study were yet to be exposed to the full spectrum of the disease. We observed that studies that reported significant financial and psycho-social burden of SCDs were conducted mostly among older groups of patients.[9, 11]

Secondly, even without considering this latency, several studies have shown that most families affected by SCDs find a way of dealing with the condition without necessarily letting it affect their cohesion. One such study that examined the quality of life of 103 caregivers in Kenya found that despite scoring very low on daily activities (25.0) and social activities (36.7), caregivers of children living with SCDs scored highly on communication (62.3) and family relationships (58.5).[12] Another study that assessed the psycho-social burden of SCDs on 225 mostly female caregivers in Nigeria found that 70.2% never experienced any family tensions or hostility, 73.3% never experienced any disagreement or quarrels and up to 81.8% never experienced any marital disharmony or threat of separation.[11] In another study that examined the burden of SCDs among 162 caregivers in Nigeria, up to 83.4% reported that their child's condition never caused any strain on family members.[24]

Thus, while caring for children living with SCDs may place substantial financial, health and psycho-social burdens on their caregivers, such burdens may not serve as sufficient triggers for IPV. Other factors, such as family vulnerabilities, resilience, access to resources and the overall perception of the disease need to be considered.[25] This situation was exemplified by a study among mothers of sick new-borns in Ghana which found no significant increase in the prevalence of IPV among mothers in the study compared to women in the general population.[26]

Intimate partner violence, like other forms of interpersonal violence, frequently arises from diverse and multifaceted predisposing factors.

Adopting an integrative framework approach such as SEM is important in understanding both predisposition and susceptibility to violence. Even in the presence of financial and psycho-social burdens, assessing the relative contributions of other predisposing factors such as individual-level factors and societal factors is essential. Such factors, which were not considered in this study, include witnessing inter-parental violence, alcohol intake, history of childhood abuse, aggressive personality types, associating with delinquent peers, harmful norms granting men control over women and societal acceptance of violence.

Apart from lack of an integrative approach, there are other important limitations that affect this study. The combined sample size of 405 women is considerably small. Assuming the past-year prevalence of any IPV among women in the unexposed cohort is 30%, a minimum sample size of 205 exposed and 820 unexposed women will be required to attain an 80% power of detecting a 10% difference in the prevalence of IPV between the exposed and unexposed cohorts (RR=1.35). Thus, even if mothers of all the children with SCDs were identified and included in the DV module, their number would still be insufficient to detect the kind of difference we would anticipate from a study such as this one.

Similarly, while this was conceived as a retrospective cohort study, the condition of temporality may not be assumed to be fully met for all women included in the exposed cohort. This is because the lower age limit for the children in this study (6 months) was less than the reference period in which the primary outcome was measured (12 months for past-year prevalence of any IPV). Thus, for some women, the past-year prevalence of any IPV might have included a significant period of time during which their families were exposed to little or no burden from SCDs.

Despite these limitations, our study demonstrated that routine survey data can be used to explore complex social phenomena with far-reaching impacts on general health and well-being of women, especially in sub-Saharan Africa, where the availability of such data may be limited. The 2018 NDHS, being the first and only nationally representative survey to include genotyping among children provided an exceedingly rare opportunity to examine the relationship between having a child with SCD and IPV victimization. To the best of our knowledge, this is the first study to ever attempt this analysis. It is recommended that subsequent demographic and health surveys recognize this opportunity and make the necessary arrangements to accommodate this objective in their methodologies, such that researchers interested in this area will find their datasets most useful.

CONCLUSION

The 2018 NDHS provided a good opportunity to study the relationship between SCDs among children and the experience of IPV among their mothers. We hypothesized that mothers of children living with SCDs could be at greater risk of experiencing IPV due to the myriad of challenges associated with raising a sick child. However, the data from the 2018 Nigeria DHS did not provide sufficient evidence for increased risk of experiencing controlling behaviour, emotional, physical or sexual violence among mothers of children living with SCDs compared to mothers of children living without SCDs. The relative risks of experiencing all the IPVs among women in the two cohorts were not significantly different. Several reasons, including latency factor, family factors, lack of an integrative approach and limited sample size may explain our findings. Further studies are needed to address these limitations and better understand the relationship between raising a child with SCD and the experience of IPV among women.

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Conflict of Interest: The authors have no conflict of interest to declare.

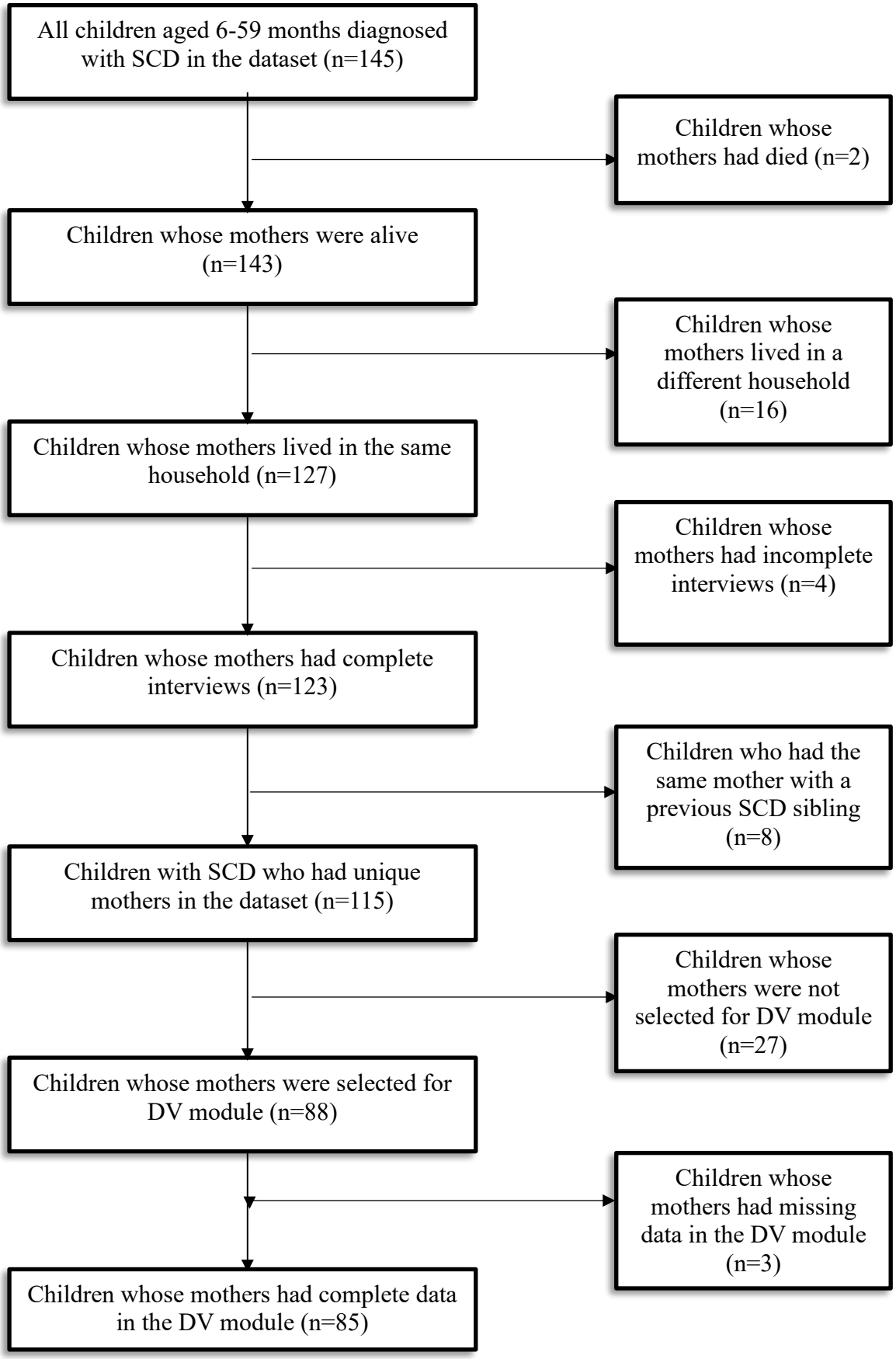

Figure 2. Number of women in the exposed cohort, based on information obtained through their children in the persons recode dataset. (SCD=Sickle Cell Disease; DV=Domestic Violence)

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