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Parental Disclosure of Own HIV Status to Children in Two Ghanaian Regions; Examining the Determinants within a Child Vulnerability Context

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Abstract

Purpose: Parent informing children and adolescents about their own HIV infection status is crucial for harmonious and interfamilial relationship despite the associated dilemma. This study assessed the factors associated with parental disclosure of own HIV status to their biological children. **Methods:** The facility based cross-sectional design approach informed the recruitment of 192 HIV positive parents. This was done through a two-stage stratified (rural/urban) and random sampling technique across 7 ART clinics and hospitals in the Ashanti and Brong Ahafo regions in Ghana between June 2018 and June 2019. Data was collected through interviewer-administered structured questionnaires. Parental disclosure to children was defined as parent own verbal statement of having mentioned HIV or AIDS as the name of his/her illness to at least one of his or her biological children. The study compared weighted proportions for variables measured categorically by the use of chi-square (χ^2) significant at $P < 0.05$ and binary logistic regression to find out the predictors of parental HIV status disclosure to children. **Results:** Of the 192 HIV positive parents aged 20 to 64 years (M, SD = 38.56, 8.34), 89.1% were females, averagely having 3 children with 89.5% having only one child being HIV positive, out of which one in every four parent was without formal education. Parental disclosure to biological children was 11% while parental own status disclosure to any child under the parent's care was 14.6%. Parental

disclosure was associated with being married or living with a sexual partner (OR = 3.4; 95% CI: 1.08 - 10.66, P < 0.036), disclosing to HIV positive child (OR = 169.9, 95% CI: 34.16 - 845.32, P < 0.000), parental perception of disclosure improving child wellbeing (OR = 10.6, 95% CI: 1.48 - 76.08, P < 0.019) and parental knowledge of someone else having disclosed status to children (OR = 5.9, 95% CI: 2.13 - 16.42, P < 0.001). None of the variables showed a significant independent association with parental disclosure when adjusted in the multivariate logistic regression. The dominant barrier to disclosure concerned parental view that children may not understand the disclosure and the parents' discomfort on finding answers to child potentially questioning parent on how the parent got infected with HIV. **Conclusions:** Only a tenth of all HIV positive parents had told their children about their own (parents) HIV status. Parental disclosure should be encouraged and interventions designed to improve it particularly as they contribute to shaping the vulnerability context of HIV and AIDS positive children.

Keywords

HIV and AIDS, Parental, Children and Adolescents, Disclosure, Vulnerability, Ghana

1. Background

Over the years, there has been a growing body of evidence that is generating around HIV disclosure. HIV status disclosure has primarily been researched around disclosure of child status to him or her by caregiver or parent, spousal or partner disclosure and parent to child status disclosure. Other forms of disclosure may exist. The growing consensus around HIV and AIDS disclosure literature is that parent to child disclosure and child own status disclosure contributes to improve the overall wellbeing of the child amidst fears of spiral effects [1] [2] [3].

The vulnerability context of HIV positive children, it has been advanced remains imagery if the parent's health situation and HIV context is not factored in intervention design. There have been considerable efforts to understand the disclosure dynamics of HIV positive children and adolescents in Ghana [4] [5]. This is aimed at shaping the development of proper intervention for positive children to reduce their vulnerability but these calls appear not to have taken into consideration the role and impact the disclosure of parent status could make to the disclosure of child own status. Such focuses have begun slowly to be recognized in recent HIV literature.

Over the past two decades, scientists have been concerned with the need for parents to disclose their own status to children in a culturally adaptable environment. However this call has been met with some difficulties including the fear of how the disclosure will impact child functioning, hold family bonds together and keep child overall child and parent wellbeing [6] [7]. Research attention on parental status disclosure appeared to have slowed particularly within

the West Africa region [6] [8] [9].

Though parents have expressed desire to tell their status to their children with its anticipated benefit in mind, feeling of shame, possible depression, impaired health outcomes have remained bottlenecks Several barriers have thus been found to impede parental disclosure but these barriers appear context defined [8] [10].

According to Letteney and colleagues [8], perceived self-stigma formed a major barrier to parental disclosure. Some systematic reviews have also identified age of parent, desire to secure child support and the inability of parent to keep the illness any longer in the quest to protect their children [9] [11] [12] [13]. The literature on the barriers to parental disclosure have often been western driven [14] [15] [16] with the few studies reporting on associated factors shaping parental HIV status disclosure in Africa conducted in Eastern and Southern Africa with little or no focus on western Africa though the region shares an ample disease burden of HIV and AIDS infection [17] [18].

Despite these observed barriers and prospects of parental disclosure of IV status to children, what pertains to Ghana remains sparsely documented? The only reported study on parental disclosure to children in Ghana was conducted over the past five years [1]. In the wake of increasing HIV prevalence in Ghana from previous 1.3% in 2012 to the current 2.4%, there is the need to generate the necessary evidence to be able to address HIV and AIDS issues from all spectrums [19] [20].

In Ghana, Avornyo and Amoah study attempting to explore reasons for the disclosure of positive HIV and AIDS parents own status to their children identified that the disclosure rate was very low [1]. While their study appears as the first and only study in Ghana reporting on parent own status disclosure to their children, the rate of disclosure was only 30% (8/26). According to the study involving 26 positive parents, those who had disclosed to their children did so on health grounds and pressure from and society.

The debilitating effect of the HIV and AIDS related illness on the parents necessitated that they got caretakers to be responsible for their care. In the end, positive parents did not have an option but to disclose to their children to create an atmosphere that could facilitate proper care from their children. This view has been corroborated by previous study in different Sub-Saharan settings. Mkwanazi and others in their study on the need for practice on disclosure, have shared that parental status disclosure to their children leads to the generation of social support and physical support [21]. This has been corroborated by Avornyo and Amoah [1]. In the studies by Avornyo and Amoah, the qualitative study was not designed to identify the determinants of disclosure though two dominant themes of parental need for disclosure and pressure from health providers emerged [1]. This brings into question the critical examination of the predictors of parental status disclosure and to identify the level of the practice among HIV positive parents from the central belt of Ghana. The study was conducted between March 2018 and June 2019.

2. Methods

2.1. Study Setting

The study was carried out in 7 antiretroviral treatment clinics/hospitals in the Ashanti and Brong Ahafo regions in Ghana. The hospitals selected in the Ashanti region were the Komfo Anokye Teaching Hospital, Animwaa Medical Centre, Tafo Government Hospital and the Asante Bekwai Municipal Hospital. In the Brong Ahafo region, the Holy Family Hospital, Techiman, Sunyani Regional Hospital, Sunyani and Saint Joseph Hospital Duayawnkwanta were selected. The study sites selected included three urban sites from Ashanti and two from Brong Ahafo region respectively. One rural site each was selected from both regions.

In the Ashanti region, the urban sites selected were the Komfo Anokye Teaching Hospital Adolescent ART clinic, Animwaa Medical Centre ART clinic and Tafo Government Hospital ART unit. The Asante Bekwai Municipal hospital was selected as the rural site from the Ashanti region. The St John of God Hospital in Duayawnkwanta was selected as the rural site from the Brong Ahafo region. The choice of the two rural hospitals was informed by having adequate number of HIV positive children being attended to as rural site hospitals in each region in Ghana. The Bono Ahafo region has the regional highest HIV prevalence of 2.48 percent followed by the Ashanti region 1.9%. The prevalence figures suggest that according to the previous ten regional divisions of Ghana, the Brong Ahafo topped in the HIV prevalence rates in Ghana followed by the Ashanti region. Similar pattern follows when prevalence figures are viewed in the light of the 16 regions of Ghana. According to the new 16 regions of Ghana, the highest prevalence was recorded by Ahafo region (2.66%) followed by Bono region (2.48%) and Ashanti region (1.9%) [20]. The study site is shown in **Figure 1**.

2.2. Study Design and Sampling

The study design was facility based cross sectional survey. The study was a facility-based cross sectional design at 7 ART hospitals in rural and urban antiretroviral treatment centers the in Ashanti and Brong Ahafo regions. A two stage stratified sampling strategy was adopted. At the stage one, the Antiretroviral Treatment hospitals/centres meeting the inclusion criteria were purposely selected. The study sites were stratified according to rural and urban locations to account for variations in study participants that lived in different geographical locations. The stage two involved the adoption of a simple random and consecutive sampling approach to select of all eligible HIV positive parents in each facility meeting the inclusion criteria. The target population of the study was HIV positive parents aged 18 and above who knew their HIV positive status and were on ARV treatment.

The study's inclusion criteria were: 1) Being HIV positive parent either biological or not; 2) Accessing HIV services or taking HIV medication in the selected facilities; 3) Willing and able to consent to the study. A total of 192 positive parents were sampled. There was no previous study reporting on the prevalence

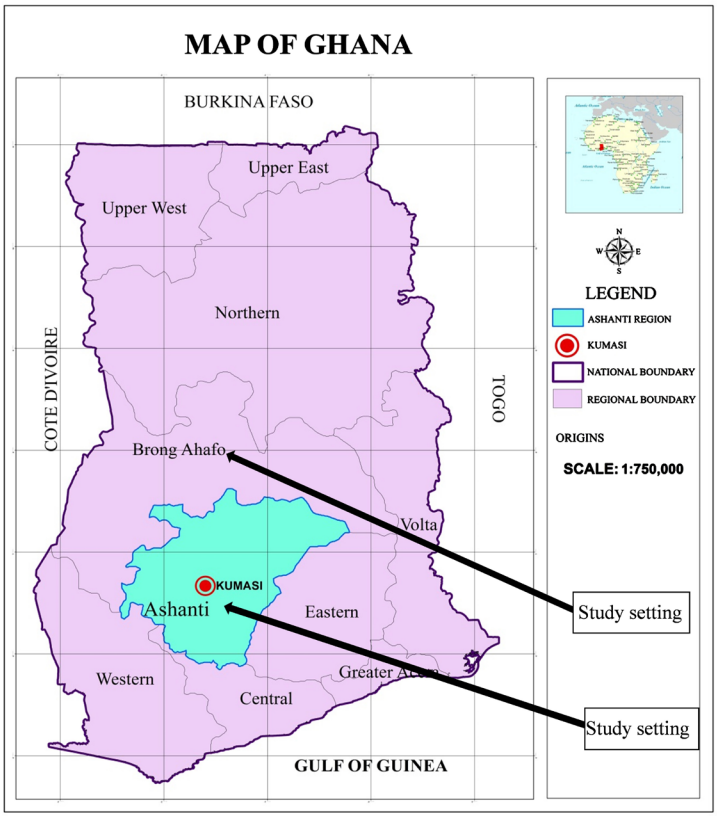

Figure 1. Map depicting the study area, source: Cacciatore *et al.* (2008).

of parental disclosure of own HIV status to children As a result, the researchers sampled from each site until availability of study participants become exhaustive in terms of new client visiting the study centres and meeting the inclusion criteria within the study period of March 2018 to June 2019.

2.3. Data Collection

The study data collection was guided by a well-designed questionnaire guided by the extant review of the literature. The entire study and its questionnaire were approved by the Ghana Health service Ethical review committee for the use of their facility with ethics approval number GHS-ERC Number: 05/06/17. In addition, Ethical clearance was also sought from the University of Ibadan Ethics review board with ethics approval number UI/EC/17/0490. Authorization letters were sent to each facility to approve of the use of their ART hospital or clinic. Positive parents consented with either oral consent and written consent depending on whether the parent could read and write. Data collection was done by the lead author and two trained data assistants supported by data managers in each of the ART clinic and ART nurses.

The questionnaire was translated into Asante Twi in each facility and was interviewer administered. The Asante Twi is the local language of the majority of persons in the study areas. In few occasions, it was administered in Bono language, a variant language of the Asante Twi with similar but slightly different

understanding from the Asante Twi. Confidentiality and anonymity were strictly adhered to as parent's personal identifiers that were traceable to them were not collected. The interviewer administered questionnaire administration sessions often took place at special units/sections with the facility where the parent's identity and responses were not open to other persons in the facility. The questionnaire contained three major parts. The first section detailed the background information of the positive parents. The section two of the questionnaire elicited parent's information on disclosure and disclosure related characteristics. The last section was concerned with barriers to parental disclosure of own status to their children.

Measurements

The outcome variable of the study was positive parental own status disclosure to own biological children. It was measured as a dichotomous variable of yes/disclosed or no/not disclosed. The independent variables consisted of positive parent background characteristics such age, region, number of children number of HIV positive children. Other independent variables were disclosure related variable such perception of disclosure effect, disclosure, disclosure to children, membership of support group and others.

2.4. Data Analysis

Data was collected using the Open Data Kit electronic data collection software. Data collected were cleaned and edited in excel and exported to Stata version 14 for analysis. A trained data clerk supported the lead author in cleaning the data for analyses. The data analysis involved both descriptive univariate and ordinal logistic regression analysis using Stata 14. The descriptive analysis was used in summarizing characteristics of positive parents. The Chi-square test (χ^2) was performed to test the association of sociodemographic and other parent level characteristics with parental own status disclosure to child. Factors that were significant in bivariate analyses were fitted in the logistic regression model to test for the predictors of positive parent own status disclosure to child. The level of significance for association in the bivariate analysis was at $P < 0.05$. All significant factors were included in the logistic regression model using a stepwise binary logistic method. The unadjusted (crude) and adjusted odds ratios (OR) and 95% confidence intervals (CIs) were reported.

3. Results

3.1. Socio-Demographic and Disclosure Related Characteristics of Positive HIV and AIDS Parents

A total of 192 HIV positive were enrolled. A fifth of all the positive parents enrolled were from the Brong Ahafo region of Ghana. More females 171 (89.06%) than male HIV positive parents 21 (10.84%) were enrolled. All the HIV positive parents had a child alive. The highest number of children a positive parent had

was 6 children.

The highest number of positive children any HIV positive parent had was three. Nearly half 93 (48.44%) of the positive parents were married while those divorced accounted for 32 (16.67%). Four in every ten HIV positive parent had either no formal education or not schooled beyond primary school level. Less than five percent of HIV positive parents 6 (3.12%) belonged to any support group of a kind. One in five of all positive parents remained unemployed with nearly 7 out of every ten positive parent 128 (66.67%) being self-employed. A little over half 97 (50.52%) of the positive parents had informed their sexual partners about their HIV status. See Table 1.

3.2. Disclosure Related Characteristics of HIV Positive Parents

Parent's own HIV status disclosure to their biological child (ren) irrespective of child's HIV status was found to have occurred among 21 (10.94%) of all positive parents studied. In all, 28 (14.60%) of HIV positive parents had disclosed their own HIV status to at least one of their HIV infected children. Half of the disclosed parents 14 (50.00%) considered their disclosure status to have impacted on the vulnerability situation of their HIV infected children. According to them, disclosure helped improve the parent/child communication. The results are presented in Table 2.

3.3. Factors Associated with Disclosure of HIV Positive Parent's Status to Their Children

Parental disclosure of own HIV status to their children was significantly associated with having HIV positive child under their care ($P < 0.000$), parent perception of HIV disclosure improving the wellbeing of children under their care ($P < 0.010$) and HIV positive parent knowledge of someone who had disclosed their own HIV status to their children ($P < 0.000$).

The region of the HIV positive parent, age of the positive parent, number of children of the parent and the gender of the parent did not show any significant association with parent status disclosure to children. Table 3(a) presents the results.

Though not significantly associated with parental status disclosure to children, positive parents who were widowed had a higher comparative disclosure rates 6 (19.35%) for their children than the children of positive parents who were married 9 (9.68%) or single 3 (9.68%). See Table 3(b).

3.4. Barriers to Parental Disclosure of Own Status to Children

The main barriers to disclosure of parental HIV status were parents fear or concern that the children may not understand the whole issue surrounding the HIV and its disclosure. Positive parents were additionally concerned about how they would respond to their children questioning them about how they got infected with HIV. These two dominant barriers were espoused by 146 (76%) of parents.

Table 1. Positive parent's socio-demographic background characteristics.

Variable	Freq (N)	Percentage (%)
Region of HIV positive parent		
Ashanti region	152	79.17
Brong Ahafo	40	20.83
Residence of positive parent		
Rural	67	34.90
Urban	125	65.10
Gender of positive parent		
Female	171	89.06
Male	21	10.94
Number of children of HIV positive parent		
1 Child	42	21.88
2 Children	42	21.88
3 Children	50	26.04
4 Children	35	18.23
5 Children	15	7.81
6 Children	8	4.17
Number of children of positive parents who are HIV positive		
No child	1	0.52
1 Child	172	89.58
2 Children	11	5.73
3 Children	8	4.17
Marital status of positive parents		
Divorced	32	16.67
Cohabiting (not married)	8	4.17
Married	93	48.44
Single	28	14.58
Widowed	31	16.15
Marital status (regrouped)		
Living without sexual partner/unmarried	91	47.4
Living with sexual partner/married	101	52.3
Age distribution of caregiver		
<30 years	35	18.22
31 - 40 years	87	45.31
41 - 50 years	52	27.09
>50 years	18	9.38
Employment status of HIV positive parents		
Full employment	17	8.85
Part time employment	6	3.13
Pensioner	1	0.52
Schooling	3	1.56
Self employed	128	66.67
Unemployed	37	19.27

Continued

Education background of HIV positive parents		
No formal education	49	25.53
Primary	29	15.10
Junior high School	72	37.50
Senior high school	26	13.54
Tertiary education	16	8.33
Religious background of positive parents		
Christian	147	76.56
Muslim	40	20.83
Traditionalist	5	2.61

Table 2. Positive parent HIV status disclosure related characteristics.

HIV positive parent has disclosed own status to at least one biological child		
Yes	21	10.94
No	171	89.06
Positive parents belong to any support group		
Yes	6	3.12
No	186	96.88
Positive parents have disclosed own status to sexual partner		
Yes	97	50.52
No	95	49.48
Positive parent with adult child has disclosed to at least one adult child >18 years (n = 118)		
Yes	20	17.00
No	98	83.00
Positive parent has disclosed own status to at least one HIV positive child (5 - 17 yrs) under his/her care		
Yes	28	14.60
No	164	85.40
Duration since positive parent disclosed own status to HIV positive children (n = 28)		
Less than 1 year	3	10.71
1 - 2 years ago	13	46.43
Positive parent considers disclosure to HIV positive children has improved child wellbeing (n = 28)		
Yes	21	75.00
No	7	25.00
Positive parent knows someone else who has disclosed own HIV+ status to his/her children		
Yes	24	12.50
No	168	87.50
Positive parent view on own status disclosure effect on the vulnerability of their HIV+ children		
Empowered child with capacity to avoid risky sex behaviour	3	10.71
Improved parent/child communication	14	50.00
Lowered child frequent illness health	3	10.71
Reduced child psychosocial discomfort	8	28.58

Table 3. (a) Factors associated with HIV positive parents' status disclosure to children; (b) Factors associated with HIV positive parents' status disclosure to children.

(a)

Variable	Parent status disclosure to children		χ^2	P-value
	Disclosed	Not Disclosed		
Region of HIV positive parent				
Ashanti region	16 (10.53)	136 (89.47)	0.12	0.722
Brong Ahafo	5 (12.50)	35 (87.50)		
Residence of positive parent				
Rural	6 (8.96)	61 (91.04)	0.42	0.519
Urban	15 (12.00)	110 (88.00)		
Gender of positive parent				
Female	19 (11.11)	152 (88.89)	0.05	0.826
Male	2 (9.52)	19 (90.48)		
Number of biological children of HIV positive parent				
1 Child	3 (7.14)	39 (92.86)		
2 Children	2 (4.76)	40 (95.24)		
3 Children	8 (16.00)	42 (84.00)	4.09	0.536
4 Children	5 (14.29)	30 (85.71)		
5 Children	2 (13.33)	13 (86.67)		
6 Children	1 (12.50)	7 (87.50)		
Number of children of positive parents who are HIV positive				
No child	0 (0.00)	1 (100.00)		
1 Child	18 (10.47)	154 (89.53)	4.16	0.245
2 Children	3 (27.27)	8 (72.73)		
3 Children	0 (0.00)	8 (100.00)		
Age distribution of positive parent				
<30 years	2 (5.71)	33 (94.29)		
31 - 40 years	7 (8.05)	80 (91.95)	4.50	0.212
41 - 50 years	9 (17.31)	43 (82.69)		
>50 years	3 (16.67)	15 (83.33)		
Employment status of HIV positive parents				
Full employment	0 (0.00)	17 (100.00)		
Part time employment	0 (0.00)	6 (100.00)		
Pensioner	0 (0.00)	1 (100.00)	4.82	0.438
Schooling	1 (33.33)	2 (66.67)		
Self employed	15 (11.72)	113 (88.28)		
Unemployed	5 (13.51)	32 (86.49)		
Education background of HIV positive parents				
No formal education	7 (14.29)	42 (85.71)		
Primary	4 (13.79)	25 (86.21)	6.61	0.158
Junior high School	10 (13.89)	62 (86.11)		
Senior high school	0 (0.00)	26 (100.00)		
Tertiary education	0 (0.00)	16 (100.00)		

(b)

Variable	Parental disclosure status		χ^2	P-value
	Disclosed	Not disclosed		
Marital status of positive parents				
Divorced	3 (9.38)	29 (90.63)	3.47	0.482
Living with sexual partner/cohabiting	0 (0.00)	8 (100.00)		
Married	9 (9.68)	84 (90.32)		
Single	3 (9.68)	25 (89.29)		
Widowed	6 (19.35)	25 (80.65)		
Religious background of positive parents				
Christian	15 (10.20)	132 (89.80)	1.37	0.503
Muslim	6 (15.00)	34 (85.00)		
Traditionalist	0 (0.00)	5 (100.00)		
Positive parents belong to any support group				
Yes	2 (33.33)	4 (66.67)	3.19	0.074
No	19 (10.22)	167 (89.78)		
Positive parents have disclosed own status to sexual partner				
Yes	13 (13.40)	84 (89.06)	1.22	0.269
No	8 (8.42)	87 (91.58)		
Positive parent with adult child has disclosed to at least one adult child >18 years (n = 118)				
Yes	6 (30.00)	14 (70.00)	2.91	0.088
No	14 (14.29)	84 (85.71)		
Positive parent has one HIV positive child under care disclosed to (5 - 17 yrs)				
Yes	19 (67.86)	9 (32.14)	109.03	0.000*
No	2 (1.22)	162 (98.78)		
Duration since positive parent disclosed status to any HIV positive children under their care (n = 28)				
Less than 1 year	2 (66.67)	1 (33.33)	2.24	0.524
1 - 2 years ago	8 (61.54)	5 (38.46)		
2 - 5 years ago	5 (62.50)	3 (37.50)		
>5 years ago	4 (100.00)	0 (0.00)		
Positive parent considers disclosure to HIV positive children improves child wellbeing (n = 28)				
Yes	17 (80.95)	4 (32.14)	6.60	0.010
No	2 (28.57)	5 (71.43)		
Positive parent knows someone else who has disclosed own HIV+ status to his/her children				
Yes	8 (33.333	16 (66.67)	14.12	0.000
No	13 (7.74)	155 (92.26)		
Positive parent view on the effect of own status disclosure on the vulnerability of their HIV+ children				
Empowered child with capacity to avoid risky sex behaviour	2 (66.67)	1 (33.33)	2.67	0.445
Improved parent/child communication	10 (71.43)	4 (28.57)		
Lowered child frequent illness	3 (100.00)	0 (0.00)		
Reduced psychosocial/emotional discomfort	4 (50.00)	4 (50.00)		

Other related barriers to disclosure of parent's status to their children were parent not wanting to cause emotional upset or pain to the children (75.51%, n = 145). Many parents expressed worry of what will happen if the children found out they were HIV and AIDS infected (68.03%, n = 140). The least form of barrier to parental disclosure was parents concern about talking with their children about the discussions that might emerge around the fear of the parent dying out of the HIV disease 78 (40.82%). The results are presented in Table 4.

3.5. Factors Influencing HIV+ Parent Status Disclosure to Their Infected and Non HIV Infected Children

The socio-demographic and background characteristics of positive parents impacted the probability of parent disclosing their status to their children. In the unadjusted bivariate model, parent living with a sexual partner whether in marital union or cohabiting (OR = 3.4, 95% CI: 1.08 - 10.66, P = 0.04) increased the odds of parental status disclosure to children compared to parents without any sexual partner. The educational level of positive parents were recoded into binary categories of having "Formal Education " and No Formal Education to account for the empty cells in its original categorization to allow for the running of bivariate analysis.

Employment status was recoded "Employed" and "Unemployed". The re-categorized educational status (P = 0.99) and employment status (P = 0.47) were not significant predictors in the unadjusted model. HIV positive parent who had disclosed own status to at least one HIV positive child (5 - 17 yrs) under his/her care had a higher odds to disclose to their biological children (OR = 169.9, 95% CI: 34.16 - 845.32, P = 0.000).

HIV positive parents who held the view that disclosure to children improves child wellbeing had a tenth fold increased odds of telling their children about their own HIV status. Knowledge of other parents or persons who had disclosed their HIV status to their children significantly increased the odds of disclosure of parent own HIV status to their children (OR = 5.9, 95% CI: 2.13 - 16.42, P = 0.001) compared to parents who did not know any other.

In the multivariate regression, disclosure to HIV positive children showed collinearity with positive parent disclosure to own biological children and was

Table 4. Parental status disclosure barriers to children.

Disclosure barrier	Yes (N, %)	No (N, %)
I worry that the children will ask me how I got infected	146 (76.00)	46 (24.00)
I worry that the children will not care about me if they found out that their parent has AIDS	132 (68.03)	61 (31.97)
My children may tell other people about my HIV infection	129 (67.36)	63 (32.64)
I do not want to cause emotional upset or pain for my children	145 (75.51)	47 (24.49)
I am concerned that I have to talk to the children about death or dying	114 (59.18)	78 (40.82
The children may not understand it	146 (76.00)	46 (24.00)

dropped in the adjusted model. Employment status of HIV positive parents (AOR = 7.4, 95% CI: 0.38 - 142.27, P < 0.187), positive parent knowledge of someone disclosing own status to child (AOR = 7.2, 95% CI: 0.39 - 131.58, P < 0.184) and the marital status of positive parents (AOR = 8.4, 95% CI: 0.47 - 152.91) were not significantly associated with parental HIV status disclosure. Table 5 presents the results.

Table 5. Multivariate binary logistic regression of factors associated with parental HIV status disclosure to children.

Variable	Total	Disclosed (%)	CoR (95% CI)	P > z	AoR (95% CI)	P > z
Residence of child	**192**					
Rural (ref)	67	8.96	1			
Urban	125	12.00	2.1 (0.44 - 9.84)	0.352	-	-
Gender	**192**					
Male (ref)	21	9.52	1			-
Female	171	11.11	2.2 (0.26 - 18.65)	0.464	-	-
Marital status of positive parents	**192**					
Without sexual partner (ref)	91	13.2	1			
With sexual partner	101	8.9	3.4 (1.08 - 10.66)	0.036*	8.4 (0.46 - 152.90)	0.149
Employment status of HIV positive parents	**192**					
Unemployed (ref)	41	14.63	1			
Employed	151	9.93	1.5 (0.48 - 4.73)	0.474	-	-
Education background of HIV positive parents	**192**					
No formal education (ref)	49	14.9	1			
Formally educated	143	9.8	0.9 (0.25 - 3.83)	0.986	-	-
Religious background of positive parents	**192**					
Christian (ref)	147	10.20	1			
Muslim	40	15.00	0.5 (0.34 - 5.87)	0.542	-	-
Traditionalist	5	0.00	0.4 (0.03 - 3.93)	0.413	-	-
Positive parents belong to any support group	**192**					
No (ref)	186	10.22	1			
Yes	6	33.33	1.3 (0.25 - 6.32)	0.771	-	-
Number of biological children of HIV positive parent	**192**					
1 Child (ref)	42	7.14	1			-
2 Children	42	4.76	0.6 (0.10 - 4.21)	0.666	-	
3 Children	50	16.00	2.5 (0.61 - 10.00)	0.203	-	-
4 Children	35	14.29	2.2 (0.47 - 9.79)	0.315	-	-
5 Children	15	13.33	2.0 (0.30 - 13.32)	0.474	-	-
6 Children	8	12.50	1.9 (0.16 - 20.51	0.613	-	-
Number of biological children of HIV+ parents who are also HIV positive	**192**					
1 Child (ref)	172	10.47				
More than 1 child	20	15.00	1.6 (0.42 - 6.04)	0.485	-	

Continued

HIV positive parent (5 - 17 yrs) under his/her care	**192**					
No (ref)	164	1.22	1			
Yes	28	67.86	169.9 (34.16 - 845.32)	0.000	N/A	N/A
Considers disclosure to improve child wellbeing	**28**					
No (ref)	7	28.57	1			
Yes	21	80.95	10.6 (1.48 - 76.08)	0.019*	7.4 (0.38 - 142.27)	0.187
Parent knows someone else who has disclosed own HIV+ status to his/her children	**192**					
No (ref)	168	7.74	1			
Yes	24	33.33	5.9 (2.13 - 16.42)	0.001*	7.2 (0.39 - 131.58)	0.184
Positive parent with adult child has disclosed to at least one adult child >18 years	**118**					
No (ref)	98		1		-	-
Yes	20		2.6 (0.84 - 7.81)	0.09	-	-

*Adjusted only for significant variables in the bivariate analysis.

4. Discussion

The descriptive cross-sectional facility based study recruited 192 HIV positive parents through a two stage sampling procedure from seven hospitals across the Ashanti and Brong Ahafo regions of Ghana. Prevalence of parental status disclosure in this study was 11% but slightly higher for HIV positive children (14.5%). Though a qualitative component would have explored the reasons for this low prevalence, parents expressed fears and dilemma reported in the barriers to disclosure may partly explain this. These may include parents not wanting to cause emotional upset or pain for their children and the concern of their children not having the capacity to understand the disclosure message when delivered.

The findings in this study reflect the challenging situation and vulnerability context within which parents own HIV status disclosure is situated. The field of disclosure of HIV status to children can either by the parent disclosing own HIV status to their children or the parent or caregiver disclosing child own HIV infected status to them. However parental disclosure has rarely been investigated in Ghana. This is consistent with how rare the practice of parental own status disclosure is among many HIV positive parents [22] [23].

Studies reporting on disclosure of HIV status though limited in Ghana, have primarily focused on disclosure of infected child status to them [4] [24] [25] [26]. Only one qualitative study has reported on parental status disclosure to children and the factors influencing the practice [1]. The present finding emerges as the first ever quantitative study reporting on the predictors of parental HIV status disclosure to children in Ghana since there is only one known qualitative study on parental own status disclosure in Ghana [1].

The study found that only one out of every ten HIV positive parents HIV had

informed any of their biological children irrespective of the HIV status of their children. The parental disclosure prevalence rather improves slightly when it had to do with parents disclosing their own status to any of the children under their care compared to their own biological children exclusively. Despite the evidence from Clifford and others narrative review reporting parental disclosure rates in middle and lower income countries from 11% to 44%, the findings in this study emerge as extremely low [2].

Consistent with previously established lower rates of parental status disclosurefrom the qualitative studies of Avornyo and Amoah which sampled only 26 parents and other studies by Osingada and others recruiting 51 parents, our findings are not extremely different [1] [27]. The reported parental disclosure rates among the purposively sampled qualitative studied parents were 30% (8/26) and 52% (27/51) from studies in urban Uganda and Urban Ghana though 100% (n = 33) disclosure finding has been reported through a similar qualitative study of positive parents from the USA [28].

The finding of 11% parental disclosure to children is thus is comparably very low particularly situating the study within quantitative findings. The systematic review of previous quantitative studies have reported mean parent to child disclosure prevalence of 41% [11] with a higher reported prevalence of 50% in Uganda [9], 35% in Thailand and 31% in studies reported from Canada [29].

The prevalence found in the present study is not so distant from findings made by studies conducted in Europe among 226 positive parents where prevalence was also reported as 11% [30]. Notwithstanding, there have been progressive improvement in HIV and AIDS care. Disclosure across several persons within the family context has evolved and as such was expected that there would have been improvement in levels of parental disclosure as compared to findings reported over two decades ago. Parent's own status disclosure has not received much academic attention as compared to disclosure to infected children. This may explain why very little is documented about parental disclosure in Ghana.

The demographic profile of the positive parents found in this study did not deviate from as reported in previous studies as it pertains to HIV parents in mostly Sub-Saharan African context and previous studied reported in Ghana in terms of level of education, gendered nature of the illness, divorce rate, and aged demography. Nearly half of the all disclosure to children had taken place not more than the past year prior to the conduct of this study.

In our present study, majority of the parents had one child. This could possibly be explained within the context of the fear of their unborn contracting the illness. This is notwithstanding the known HIV mother to child prevention measures such as PMTTC to reducing mother to child transmission [19]. There was also obvious possibility of parents having difficulty of raising an additional child (ren). Among parents who had told their children about their own status, more than half believed disclosing their own status to their children could help

improve the living conditions of their children particularly those who had HIV positive children [27]. While the vulnerability levels of HIV household has been known to be mitigated by self-help groups such as models of hope associations, only three percent of parents were involved in any social support group or associations.

Among the factors found to be associated with parental status disclosure were parent having an HIV infected child under their care, parental perception of disclosure improving child wellbeing and parents knowledge of someone disclosing their own HIV status to their children.

In contradiction to previous studies establishing the association between age of parent and parental disclosure in Uganda, United, States of America Burkina Faso and China the present study did not establish such association [8] [12] [15] [16]. The non-association between parental age and disclosure may be explained by virtue of the low number of parents who had disclosed and also the relatively younger ages of the HIV positive parents. This is buttressed by the often justified proposition that, as parents age older, there are increased odds of telling their children about their HIV status and not keeping it a secret any longer to be able to gain the necessary care and support.

In the present study, no significant association was found to exist between where the parent lived, whether urban or rural, region number of children and the gender of the parent. Neither was education status associated with disclosure as had been found in studies conducted elsewhere in Africa [12].

A quite surprising finding that was established in this study was the association between parent knowledge of someone telling his or her status to child and parental status disclosure. This comes as surprising as there is little documented evidence in previous studies to explain such an association. It remains possible that, as parents attend clinic days for ARV medications, they converse among themselves and are more likely to trust the narrative on the positive impacts of those who have disclosed their status to their children and hence decide to replicate. There is therefore the effect of parental peer influence in shaping disclosure.

In terms of the barriers to disclosure, this study found parental fear or concern that the children may not understand the whole issue surrounding HIV disease and its disclosure to the children and particularly the response to the question of how the parent got infected.

Additional related barriers to disclosure of parent's status to their children were parent not wanting to cause emotional upset or pain to the children. Parents expressed worry of what will happen if the children found out they were HIV and AIDS infected. The least form of barrier to parental disclosure was parents concern about talking with their children about the discussions that might emerge around the fear of the parent dying out of the HIV disease. The fear of children telling others about parent status was not prominently spelt out as a barrier, an observation that was found to differ with many earlier findings in Ghana, Botswana and South Africa [1] [17] [18].

5. Conclusions

In Conclusion, the study found an association between parental disclosure and HIV positive status of child, knowledge of someone having disclosed own status to their child and perception of disclosure enhancing child's wellbeing at the bivariate level. These factors did not independently predict parental status disclosure when adjusted. This calls into question the need for interventions that would help improve parental disclosure particularly isolating those who have HIV positive children to foster peaceful co-existence in the home. The unique significant association between parent knowledge of those who have disclosed to others and parental own status disclosure worth further explores how the dynamics work using a qualitative study approach.

Parental disclosure has received near absent research attention in Ghana despite the increasing levels of disclosure related research attention on children and adolescents in recent years. Though the focus on children and adolescents is welcoming, the vulnerability context within which children live particularly HIV positive children requires that parents are able to tell their children about their condition to be able to serve as direct role models to them. This will help address challenges related to ARV medication adherence, risky sexual behaviour taking and general emotional support. Further study is required to probe the relationship and associational dynamics of child clinical factors with parental disclosure and explore the comparative living conditions of parents who have disclosed and those who have no mixed-method research lens. A mixed-method study will help explore the dynamics and the extent to which vulnerability factors shape parental own status disclosure.

Ethical Approval and Consent to Participate

The study sought Ethical approval from the ethics and research committees of University College Hospital, University of Ibadan and the Ghana Health Service. Additionally both written and verbal informed consent was sought from the parents who participated in the study.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

Authors' Contributions

SCYA conceptualized, designed and analyzed the study data and prepared the first draft of the manuscript. OAA offered critical appraisal of the study design and the results and offered inputs into the results. OA contributed to the study design and read through the manuscript. JMD provided critical input in qualitative components of the study. NKM contributed to the data analysis. All authors approved of the final manuscript.

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