Journal of Integrated Health xxx (2022) xxxxxx

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Gender Disparity in Vulnerability among Orphans and Vulnerable Children in an Education Support Programme in Zambia

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ARTICLEINFO

Keywords:

Gender disparities; Orphans and Vulnerable Children; Support; Zambia

ABSTRACT

Background: Gender differences in accessing education supports are a long-standing concern, especially in sub-Saharan Africa. The purpose of this study was to examine whether patterns of gender differences in accessing education support exists among secondary school-going Orphan and Vulnerable Children (OVC) in Zambia. **Methods:** We used secondary data from a survey of OVC attending secondary school in selected provinces of Zambia to assess vulnerability. The vulnerability was assessed using the Child Status Index (CSI) and was used as the basis for education support. The vulnerability was modelled as a function of baseline characteristics of the sample. **Results:** Vulnerability was substantially greater among boys compared with girls, but boys were fewer in both models (vulnerable vs more vulnerable & most vulnerable) and (vulnerable & more vulnerable vs most vulnerable). Vulnerability for boys was consistent across provinces. Boys were more likely to be vulnerable compared to their girl counterparts adjusting for age group, school grade and year of sponsorship. **Conclusion:** This study has shown that there are some gender differences in accessing education support by OVC. Support programs for OVCs need to assess vulnerability of OVCs that take into account gender disparities in vulnerability.

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Received 11 March 2022; Received in revised form 18 April 2022; Accepted 11 May 2022

Journal of Integrated Health (JIH)

Available online 14 May 2022

Published by URF Publishers.

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Introduction

In sub-Saharan African countries, the high prevalence of Human Immunodeficiency Virus (HIV) has resulted in mortality mostly in the reproductive age group over the last four decades [1-3]. This has given rise to many children made orphans and vulnerable [2,3].Also, contributing to this growing number of orphans is the high poverty levels which have led to the disintegration of many families at household levels compounded by the increased breakdown in family protection and social networks that were once common and strong in most African settings [4,5]. HIV and AIDS has orphaned about 16 million children aged below 18 years of age in Low and Middle-Income Countries [6].Other estimates put the number of OVCs at about 20 million[7].Unfortunately, the sub-Saharan Africa region is disproportionately affected[6,8]. Furthermore, this region is home to conflicts and an epicentre for infectious and emerging non-communicable diseases which contribute to a higher mortality, ultimately leading to OVC, while most governments are unable to cope with the increasing number and basic needs of OVC [7,9,10].

The President's Emergency Plan for AIDS Relief (PEPFAR) programme for children who are orphaned and made vulnerable by HIV/AIDS, identified six broad domains using the Child Status Index (CSI) to assess basic needs and vulnerability level of OVC [6, 8]. These basic needs include food and nutrition, shelter, child protection, education, health and psychosocial support [6,8].Of these basic needs, one of the most important is education which was endorsed by the United Nations Convention on the Rights of the Child and made commitment to the goal of Education for All (EFA)[11,12]. Education is widely acknowledged as an important factor for human development [13,14].It has also been argued that provision and improved access to education is key to poverty reduction, especially in resource-poor settings [13,15,16]. Gender disparities are mostly noticed in Africa in educational enrolment and attainment [17]. In other parts of the developed world such as North America, Western Europe and Nordic countries, education disparities which disproportionately affect girls have been significantly reduced or eliminated [17]. In order to address this gender disparity, there has been some global policy frameworks such as Sustainable Development Goals, Education 2030 and regional strategies in Africa and the Commonwealth and Group of Seven (G-7) countries, in which all aimed at promoting gender equity in education especially in support of female children[18,19]. But still, gender disparities exist in education and a few studies suggest that the approach to address this has been taken in a piecemeal approach rather than strategically and holistically [10,16]. Following this, most countries in sub-Saharan Africa have improved on school enrolment rates, school attendance, school completion rates and learning outcomes[4,16].

Gender differences in vulnerability are a long-standing concern for resource-poor settings [20,21]. Such differences have been documented in access to education support programmes, the amount of support received, and these can determine the level of vulnerability [15]. The level of vulnerability among school-going OVC are of particular importance since these need basic support which is a challenge to many governments in resource-poor settings [7,10].This gap of basic needs is largely filled up by the NGOs, and most of them concentrate on females as females constitute the majority of the beneficiaries for most of the support programmes to maintain school attendance [10,11,12]. Achieving gender-equitable access to support may reduce vulnerability between girls and boys [4,10].

This study used secondary data from a baseline survey on the Adolescent Girls Accessing Prevention and Education Programme(AGAPE) to determine whether gender differences in accessing educational support exists among secondary school-going OVC in selected provinces in Zambia. The AGAPE Program is implemented by the Churches Health Association of Zambia (CHAZ) and is funded by the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM). This is important for policy perspectives because it can address inequities in accessing support among OVC with similar basic needs.

Materials and Methods

Study population

This study analysed data from 2016 to 2020 from the Adolescent Girls Accessing Prevention and Education Programme (AGAPE). The AGAPE is a programme in selected provinces of Zambia in which secondary school-going OVC are given education support in order to help them stay in school. The selection is based on prevailing poverty levels, school drop-out rates during pregnancies, early marriages and HIV prevalence rates. From the selected schools, a committee for beneficiary selection is constituted which comprises of teachers, members of the community and some civic and church leaders who are later trained in vulnerability assessment using the PEPFAR Child Status Index (CSI) form(CHAZ 2013).

Sample size

There were 2763 OVC, including 614 boys and 2149 girls in grades 10 - 12 in this study. All the OVCs supported by the program were included in the study.

Outcome variable

The vulnerability was assessed using the Child Status Index (CSI) tool(CHAZ 2013). It is interviewer administered vulnerability status which covers six thematic areas of health, nutrition, shelter, protection, education, and economic status of households. Each thematic area was scored based on the rating below:

Health	
0 No health constraint	**Protection**
1 Good health with minimal sickness	0 No protection constraint
2 Frequently sick with access to health care	1 At-risk of abuse
3 Frequently sick with no access to health care	2 Requires social protection
4 HIV+ with chronic illness	3 Has experienced abuse or exploitation
	Nutrition
Education	0 No nutritional constraint
0 No educational constraint	1 Child shows weight loss compared with age-group in the community
1 Irregular school attendance	2 Child shows weight loss compared with age-group in the community and is ill
2 Drop-out from school	3 Child shows serious weight loss and is chronically ill 4 Household food insecurity
3 Never attended school	
Shelter	**Household economic strengthening**
0 No shelter and care constraint	0 No economic constraint in a child's household
1 Overcrowded home	1 Caregiver with low-income level
2 Dilapidated shelter	2 Caregiver with no income-generating skills
3 No shelter (living on the street)	3 Child providing income for the household
	4 No source of income for the household.

The vulnerability was then measured after summing up the scores from all the thematic areas as follows: Vulnerability Status Grade:

Most Vulnerable 15 –21

More Vulnerable 10 –14

Vulnerable 1–9

Independent variables

Independent variables were determined from the characteristics in the baseline survey. These are Age (17 or < 17 years), gender (boy or girl), Province (Muchinga, Eastern and Luapula), School grade (10, 11 and 12), Orphans status (double orphan, single orphan and vulnerable), sponsorship status (completed or active) and year sponsorship stated (2016, 2017, 2018, 2019 and 2020).

Statistical analysis

Data were entered in an Excel spreadsheet and exported to Stata 15 (StataCorp. College Station, Texas, USA) for analysis. In order to identify the potential influence of gender on vulnerability, we conducted the analysis of data in two stages.

Firstly, we used a proportional-odds model (POM), taking into consideration the ordinal nature of the outcome variable (vulnerability). After analysis, it was observed that all the variables in the model were significant at 5% level, but the test for POM assumption which was done using a user-written command "omodel" showed that the chi-square test was significant, suggesting the failure of model assumption [22,23]. Further analysis of POM assumption for each covariate using a user-written command "brant" test showed that one variable (province) failed the model assumption as its p-value was significant (0.002), but the rest had insignificant p-values which we further confirmed by a parallel lines plot [24].

In the second analysis, before making a final decision, we progressed to use a suitable alternative model, the partial proportional ordinal model (PPOM). The main advantage of PPOM is that it relaxes the parallel lines assumption for a subset of the β across M outcome categories. In that regard, it is more accurate than proportional ordinal regression model, and it has better parsimonious than the multinomial regression model. To fit the PPOM to the data, we used a user-written command "*gologit2"*[25] with relaxed parallel regression assumption at a 1% level of significance. According to William [25], the general model of PPOM can be written as:

$$P\left(Vulnerability_j > j = g\left(X\beta_j\right) = \frac{\exp(a_j + IND.Variable_j\beta_j)}{1 + [\exp(a_j + IND.Variable_j\beta_j]}, j = 1, 2 \ldots M - 1\right)$$

Where *M represents* the number of categories of the ordinal dependent variable (i.e. 3).

To assess the determinants and required correct functional form of the independent variables to build models, an adequate goodness-of-fit was assessed by Hosmer and Lemeshow test [26]. The results are presented in the form of odds ratio (ORs) with their respective 95% confidence intervals (CIs). In all analyses, a *p*-value < 0.05 was considered as statistically significant.

Ethical considerations

Permission was sought and obtained from the ERES CONVERGE IRB for conducting this study (Reference Number 2020-Nov-003). The Ministry of General Education, provincial education offices and schools, as well as village heads of all the communities involved in the survey also gave permission. During data collection for the programme, permission was sought and obtained from the OVC and their guardians. We assured and maintained anonymity as well as confidentiality and de-identified linkage to a particular child during data analysis of OVC.

Results

The 2777 children in the study represent OVC attending secondary school in selected provinces of Zambia that were supported by the program. Of these, 2094 (75%) were female, and the majority of 1365(55%) were less than 17 years of age. This sample included 1487 (53.2%) from Eastern, 826 (29.6%) from Luapula and 483 (17.2%) from Muchinga provinces. Only 477 (17.5%) were kept by at least one parent, and more than half, 1616 (57.7%), were in the more vulnerable category of vulnerability. **Table 1** presents baseline characteristics of OVC by gender. Among OVC of either age group (<17 and ≥17), girls tended to be more than boys and were more likely to be kept by the parent(s). The majority, 1302 (82.2%), of the girls were in grade 10 but the proportion reduced as the grade increased. Also, in terms of vulnerability status, girls were more likely to be in the vulnerable category, but the frequency tendered to reduce towards higher levels of vulnerability. No gender difference was identified for province and type of OVC.

Table 1: Baseline characteristics of OVC by gender of the study population (N=2777).

Characteristics	**Boys**	**Girls**	**P-value**
Age (years)			
< 17	253 (18.5)	1112 (81.5)	
≥ 17	348 (26.2)	982 (73.8)	< 0.001
Province			
Muchinga	113 (23.4)	370 (76.6)	
Eastern	340 (23.4)	1115 (76.6)	
Luapula	160 (19.8)	647 (80.2)	0.126
Year sponsorship started			
2016	7 (1.9)	354 (98.1)	
2017	5 (1.1)	433 (98.9)	
2018	249 (35.4)	455 (64.6)	
2019	136 (20.2)	539 (79.9)	
2020	215 (38.2)	348 (61.8)	< 0.001
OVC status			
Double orphan	117 (24.6)	359 (75.4)	
Single orphan	173 (26.5)	632 (78.5)	
Vulnerable	314 (22.2)	1099 (77.8)	0.426
Sponsorship status			
Completed	186 (15.3)	1029 (84.7)	
Active	427 (27.7)	1103 (72.1)	<0.001
School grade			
10	285 (17.9)	1302 (82.1)	
11	206 (25.7)	595 (74.3)	
12	116 (35.4)	212 (64.6)	< 0.001
Vulnerability			
Vulnerable	43 (17.7)	200 (82.3)	
More vulnerable	316 (19.9)	1268 (80.1)	
Most vulnerable	254 (27.6)	664 (72.3)	< 0.001

Vulnerability by gender

Province-adjusted analysis by gender showed variation in vulnerability; including instances of no gender difference as well as provinces where gender differences existed. **Figure 1** shows the province-vulnerability adjusted by gender. For Muchinga province, boys had similar frequency in terms of vulnerable (0.2%) and most vulnerable (11.4%) when compared to girls (vulnerable 0.3%, most vulnerable 10.5%). In Eastern province, boys frequently reported to be less vulnerable (6.7%) compared with girls (8.7%) but increased to be more vulnerable (boys 30.5% vs girls 29%) and most vulnerable (boys 18.3 vs girls 14.5%), respectively. For Luapula province, although boys were less likely than girls to be vulnerable (boys 0.2% vs girls 0.3%) or more vulnerable (boys 14.2 vs girls 23.9%), respectively. Boys were more likely to be most vulnerable (boys 11.7 vs girls 6.1) as shown in **Figure 1.**

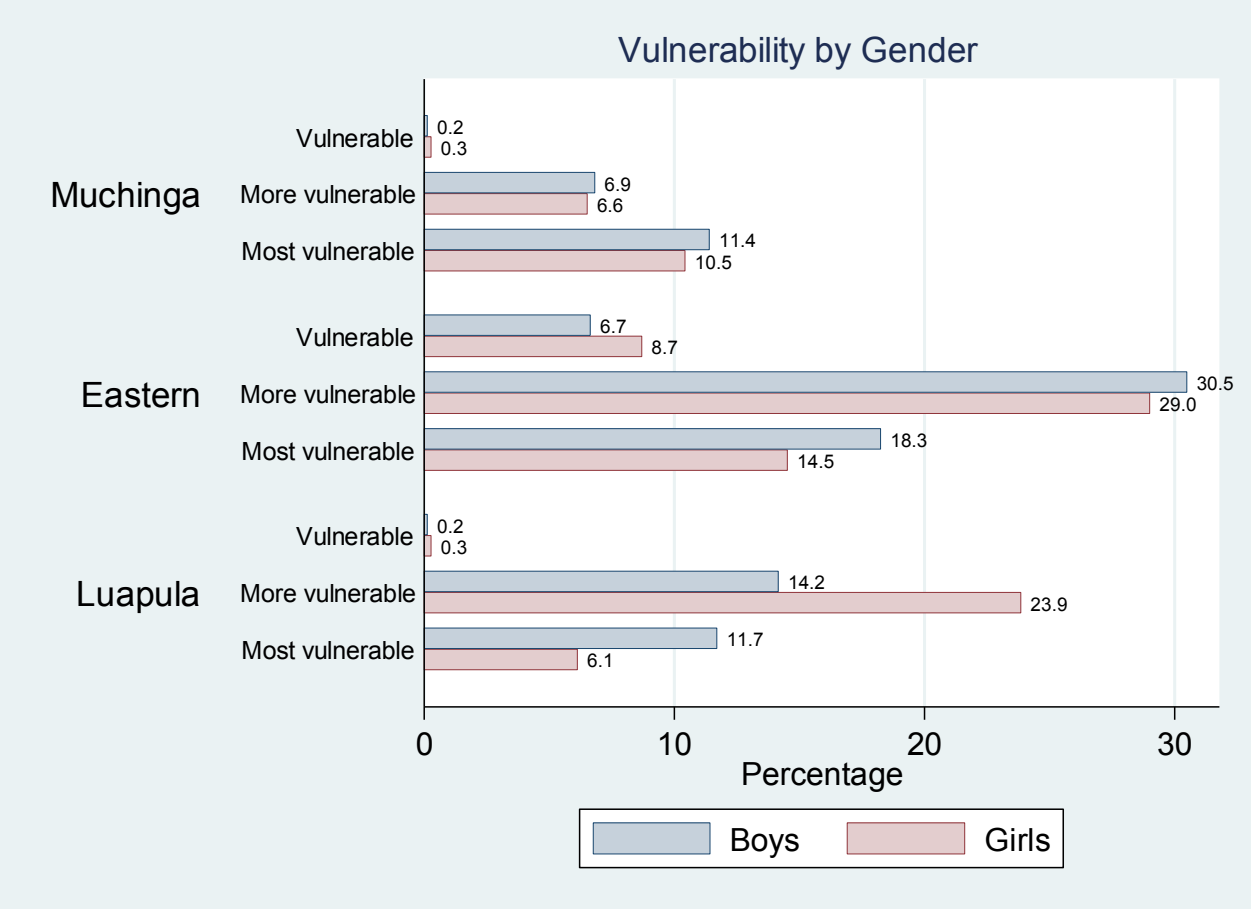

Figure 1: Province Vulnerability Adjusted by Gender.

Multivariate Regression Analysis

Table 2 shows the multivariate relationships between vulnerability and independent variables stratified by gender. Two equations were used to obtain the results. The first equation presents the adjusted odds ratios (aORs) of vulnerable compared to the more vulnerable of most vulnerable. The second equation shows ORs of vulnerable or more vulnerable compared to most vulnerable.

Age was found to be significantly associated with the differences in odds of vulnerability. It was observed that boys of both ages were likely to be more vulnerable or most vulnerable than to be vulnerable compared to their girl counterparts (aOR= 1.12; 95% CI: [1.02, 1.59]).They were also more likely to be most vulnerable than vulnerable or more vulnerable (aOR = 1.41; 95% CI: 1.18, 2.22). Equally, boys aged ≥ 17 years were more likely to be most vulnerable than vulnerable or more vulnerable compared to girls (aOR = 1.33; 95% CI: 1.09, 1.73). This was true when odds for boys of being most vulnerable than more vulnerable or vulnerable was compared to that of girls (aOR= 1.35; 95% CI: 1.07, 1.91).

The grade variable, it was observed that boys OVC who were in grade 10 were more likely to be more vulnerable or most vulnerable than to be vulnerable compared to girls (aOR = 1.28; 95% CI: (0.84, 2.72), although this was not significant. This was also true with the odds of being most vulnerable than being vulnerable or more vulnerable (aOR = 1.31; 955 CI: 1.02, 1.92). Moreover, boys in grade 11 were observed to have higher odds of more vulnerable or most vulnerable than to be vulnerable compared to girls (aOR = 1.36; 955 CI: 1.36, 3.83) and the same was true when the odds for boys were compared to that of girls for being more vulnerable or most vulnerable than to be vulnerable (aOR = 2.4; 95% CI: 1.93, 4.16). Also, similar patterns were observed for grade 12 OVC.

In terms of orphan status, boy OVC who were double orphans were observed to be significantly associated with the odds of being more vulnerable or most vulnerable than to be vulnerable compared to girls (aOR = 2.42; 95% CI: (1.04, 2.72). This was also true with the odds of being most vulnerable than being vulnerable or more vulnerable (aOR = 2.29; 95% CI: 1.31, 3.93). However, single orphans, boys were less likely to be more vulnerable or most vulnerable than to be vulnerable compared to girls (aOR =0.88; 95% CI: 0.49, 1.71), but this was not significant. To the contrary, they were significantly more likely to be most vulnerable than vulnerable or more vulnerable compared to girls (AOR= 1.42; 95% CI: 1.07, 2.89). Also, vulnerable boys were more likely to be either more vulnerable or most vulnerable than to be vulnerable as well as most vulnerable than being vulnerable or more vulnerable.

Furthermore, this study found that boy OVC from Eastern province (aOR = 1.40; 95% CI: 1.01, 2.23) were more likely to more vulnerable or most vulnerable than to be vulnerable. Similarly, they were more likely to be most vulnerable than vulnerable or more vulnerable compared to girls (aOR = 1.35; 95% CI: 1.02, 2.29). For support status, only those boy OVC who completed the programme were significantly more likely to be most vulnerable than vulnerable or more vulnerable (aOR = 2.62; CI: 1.89, 4.72).

The only statistically significant year of sponsorship was the year 2020 (aOR = 2.1; 95% CI: 1.12, 6.32) which was associated with higher odds of more vulnerable or most vulnerable than to be vulnerable.

Table 2: Multivariate analyses of independent variables for vulnerability ladder stratified by gender (N = 2777).

Characteristic	Vulnerable vs. (More and & most vulnerable)			(Vulnerable & more vulnerable) vs. most vulnerable		
	Male N= 358	Female N=1466	Male OR (95% CI)	Male N= 613	Female N= 2131	Male OR (95% CI)
Age (year)						
< 17	93	89	1.12 (1.02, 1.59)	42	31	1.41 (1.18, 2.21)
≥ 17	94	92	1.33 (1.09, 1.73)	40	32	1.35 (1.07, 1.91)
Grade						
10	96	94	1.28 (0.84, 2.75)	45	38	1.31 (10.2, 1.92)
11	92	86	1.35 (1.01, 3.82)	46	23	2.42 (1.93, 4.16)
12	90	79	1.98 (1.09, 4.62)	24	14	1.95 (1.11, 3.98)
0VC status						
Double orphan	97	92	2.42 (1.04, 2.72)	56	35	2.38 (1.31, 3.93)
Single orphan	92	93	0.88 (0.49, 1.71)	49	36	1.41 (1.07, 2.89)
vulnerable	94	89	1.62 (1.00, 2.77)	33	28	1.13 (0.88, 1.69)
Province						
Muchinga	99	97	1.96 (0.43, 18.6)	62	60	1.02 (0.58, 1.99)
Eastern	88	83	1.40 (1.01, 2.23)	34	27	1.35 (1.02, 2.29)
Luapula	99	98	1.63 (0.31, 15.4)	45	20	2.94 (1.87, 4.49)

Support status						
Completed	88	84	1.32 (0.93, 2.53)	28	12	2.62 (1.89, 4.72)
Active	94	95	0.77 (0.32, 1.31)	47	49	0.83 (0.63, 1.29)
Sponsorship year						
2016	90	90	0.99 (0.13, 8.01)	20	11	5.14 (1.12, 14.8)
2017	80	84	0.86 (0.76, 4.83)	20	8	1.99 (0.43, 13.7)
2018	89	90	0.96 (0.49, 7.11)	31	28	1.12 (0.78, 1.79)
2019	96	91	2.16 (1.12, 6.32)	45	51	0.84 (0.59, 1.19)
2020	98	97	1.14 (0.27, 5.72)	54	61	0.62 (0.48, 1.13)

OR = adjusted odds ration; CI = confidence interval; OVC = Orphan and vulnerable children; Referents are girls aged <17 years. Note: Statistically significant differences are in bold

Discussion

This study analyse data on 2,777secondary school-going OVC to investigate gender differences in vulnerability and the extent to which any observed gender differences were mediated by differential demographic characteristics. Significant and resilient gender differences were observed for age category, school grade, and province and vulnerability status.

With regard to age categories(< 17 and ≥ 17 years), OVC's vulnerability was significantly greater for boys than for girls; however, after controlling for other variables, the evidence for Muchinga province was not significant but remained significant for Eastern and Luapula provinces. For school grade, the vulnerability was less frequent as OVC moved from grades 10 to 12 among boys compared to girls. Upon controlling for other variables, no change in gender differences across all provinces occurred. In contrast, these OVC who were double orphans, single orphans or vulnerable, the vulnerability was greater and significant among boys compared to girls in Eastern and Luapula provinces as well as in Muchinga province, but not significant. This study makes a contribution to the growing evidence on gender disparities in terms of vulnerability in schools which are not uniform across geographical areas [27]. A study on the Copperbelt in Zambia also showed that vulnerability varied from one district to another even within one province in a country [27]. Studies from sub-Saharan Africa and other low-income countries have also found geographical disparities in vulnerability among OVCs[28,29]. The reason for the disparities in geographical vulnerabilities could be due to some socio-cultural and economic differences across countries and even regions within a country [21].

The fact that boys were consistently found to be more vulnerable than girls in this study implies that this finding was not random. The vulnerability of boys and girls show some interesting patterns. Although Muchinga province was worse than the other two provinces in terms of vulnerability, boys were as likely as girls to be vulnerable in both age categories suggesting that girls and boys entered the AGAPE programme based on objective criteria. For the other provinces, results were similar, although the vulnerability was slightly reduced; however, it still remained significant in the older age category. One plausible reason could be that older OVC are more likely to solicit for simple jobs such as domestic work or find some other coping mechanisms that can provide some financial benefits resulting in less vulnerability [30,31,32].

For vulnerability status, although generally in all categories, boys had higher odds of vulnerability compared to girls. It was surprising to see that boys were found to be more vulnerable than girls. The traditional socio-cultural beliefs and practices in Zambia tend to place less value on girls, and it was expected that girls would be more vulnerable than boys. Based on this narrative, programs and policies skewed towards empowering vulnerable children, especially girls, have been designed and implemented over time [10].Proponents of the Education For All (EFA) narrative are more concerned with gender disparities in education with a bias towards a female child's education, whilst those of the Inclusive Education narrative give special attention to the disabled in education[10,12,15]. The Agape program transcends these narratives in that it incorporates both girls and boys, and this is one of the best practices that ensure that boys are not left behind when pursuing a female child's empowerment. Some scholars have argued that programs need to gather local data on vulnerability in order to best serve the most vulnerable in the local community [28].

Authors' contributions

DMM conceived the concept, CMM, JM and HM collected

the data during routine monitoring. All authors contributed to the development of the manuscript and reviewed it. NM conducted the statistical analysis. All authors reviewed the final manuscript and approved it for submission. KS provided the overall strategic leadership. DMM DhallyMutomboMenda, MN MukumbutaNawa, RKZ Rosemary KalumianaZimba, CMM Catherine MukukaMulikita, JM Jim Mwandia, MMK Michael MutayaKachumi, HM Harrison Musonda& KS Karen Sichinga.

Acknowledgements

The authors would like to sincerely thank CHAZ management, the GFATM, the Ministry of General Education, the provincial education authorities in Eastern and Muchinga provinces, the district education authorities, the schools' administrations and teachers, communities and our beloved participants in the study.

Competing interest

This work has no competing interest to declare.

Funding

The AGAPE Programme was supported by the Global Fund to fight AIDS, Tuberculosis and Malaria Grant.

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