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Experience of paid childhood work activity and adulthood self-reported health status in a cohort of adults in Ghana

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Abstract

Background: There is a dearth of literature from sub-Saharan Africa on the effects of early (< 15 years) onset of paid work in children on future health status. This analysis was conducted to establish the effect of early onset of paid work in children on the adulthood health status of a cohort of adults in Ghana.

Objective: This study aimed to establish the association between early-onset (engaged in work activities before the age of 15 years) paid child labour work activity (CL) and future older adult health status in Ghana**.**

Methods: The World Health Organization study on global AGEing and adult health Ghana Wave 2 dataset was used for this study. A multistage cluster sampling design was used to select a nationally representative of 4735 Ghanaians aged ≥ 18 years. The Modified Poisson and Logistics Regression were employed to assess associations between early onset of child labour and future health status. All analyses were performed with STATA Statistical Software and $p < 0.05$ was deemed significant.

Results: The prevalence of CL was 4.20% [95% confidence interval (CI): 3.30 – 5.20] and poor self-reported health (SRH) was 15.61% (95% CI: 13.92 – 17.60). Overall, SRH was significantly associated with CL. The prevalence of poor SRH among older adults with experience of CL was 41% [from Modified Poisson estimations: adjusted Poisson ratio (aPR) = 1.40; 95% CI = 1.01 – 1.96] and 47% [from Logistic regression: aOR = 1.47; 95% CI = 1.01 – 2.17] compared with those with no experience of CL.

Conclusion: A positive relationship existed between child labour and the future health status of individuals in this nationally representative study sample. These results reveal another collateral benefit (healthier adult populations) from the national government's quest to provide universal and free education up to the secondary level in Ghana. Equitable distribution of education and social opportunities for the current younger population and children in Ghana will reap several demographic and health dividends.

Keywords: Childhood work, child labour, self-rated health, adults, older adults

INTRODUCTION

Around the 19th century, child labour (CL) was highly prevalent in low- and middle-income countries (LMICs), however, from the 20th century onwards, the engagement of children in paid activities remained prevalent mostly in developing countries [1]. Over 218 million children globally go to work daily instead of being in school, with the highest prevalence found in sub-Saharan African countries [2]. In all, 90% of these children are employed in agriculture and animal husbandry [3]. In Ghana, an estimated 21.8% of children aged 5 - 17 years are engaged in CL, and 14.2% are involved in hazardous work [4]. The International Labour Organization describes child labour as work that deprives children of their childhood, potential, and dignity, and is harmful to physical, and mental development [5]. Child labour includes work that is physically, socially, mentally and morally harmful to children or disrupts their schooling [6]. Early-onset of engagement in paid activities for children and child labour generally affect social development and may have direct negative health implications in childhood, as well as curtail educational advancement leading to

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additional financial and health consequences over an individual's lifetime. Children who are engaged in working in hazardous places are most at risk, with severe threats to their health during childhood and adolescence [7]. Most often, child labourers begin working at a very young age from 5 to 14 years where they receive low wages or are unpaid and use their income for the survival of themselves and their family are sometimes unpaid. It is a widespread belief that poverty contributes to the decision of families to force children into labour to supplement household incomes [8]. The ILO also guides the line between CL and reasonable domestic work: "household chores undertaken by children in their own homes, in reasonable conditions, and under the supervision of those close to them are an integral part of family life and of growing up, therefore something positive. However, when these workloads interfere with children's education or are excessive, they can be tantamount to child labour". Similarly, helping with the family business, within a reasonable balance, can provide the skills and experience that contribute to a productive adult working life [9]. Child labourers have more years to develop health-related conditions like Human Immunodeficiency Virus (HIV) compared with later entry into the labour force [8,10] and generally, individuals with good health during childhood have better health outcomes in adulthood [11]. Lee and Orazem established a relationship between self-rated health (SRH) and CL and observed that poor SRH and early onset CL were associated with poor health in adulthood [12]. There is a dearth of literature from sub-Saharan Africa on the effects of early-onset (< 15 years) of paid work in children on future health status. This analysis was conducted to establish the effect of early onset of paid work in children on the adulthood health status of a cohort of adults in Ghana.

MATERIALS AND METHODS

This analysis was based on the World Health Organization's Study on global AGEing and adult health (SAGE) Ghana Wave 2 (2014/2015). SAGE is a longitudinal study carried out in nationally representative samples of adults, examining a wide range of health indicators including health state and disability, subjective well-being, socioeconomic conditions, and demographic characteristics [13,14]. A multistage cluster sampling design was used to select a nationally representative sample from 250 primary sample units and 20 strata [15]. Individual and household sampling weights were generated for analyses. Details about the study design and procedures for data collection have been published elsewhere [16].

Study participants and outcome variables

SAGE Ghana Wave 2 involved adults in Ghana aged 18 years and older. This analysis included 4735 adults aged ≥ 18 years. The primary outcome variable was self-rated health and the exposure-outcome variable was whether the participant reported having ever experienced child labour (CL). Participants rated their health based on the question: 'In general, how would you rate your health today?' The responses included 'Very good' (response 1 – 2); 'Good' (response 3); 'Moderate' (response 4), and 'Poor' (response 5). Based on the study objective, the responses were further re-classified as 'Good SRH' (score 0 for responses 1 – 2) and 'Poor SRH' (score 1 for responses 3 through 5). Other studies have adopted the same approach in assessing SRH in Ghana and elsewhere [17,18] and is generally a valid indicator of current and future health outcomes [19,17]. In addition, participants were asked the question 'At what age did you start working for pay?' Reported ages were grouped into 1 (< 15 years and classified as 'ever CL') and 0 (> 15 years and classified as 'never experienced CL'). 'Ever experienced CL' was classified based on the United Nations Educational, Scientific and Cultural Organization's definition of the minimum age to engage a child in employment. Similarly, the Ghana Children's Act 560, 1998 (gazetted in 1999) defines a minimum age of 15 years for paid employment [20].

Independent variables

The study covariates included sex, age group, highest educational level, marital status, religion, place of residence, geographical location/region, place of birth, and previous employment status of mother and father. The detailed variable definition can be found in Supplementary Data 1.

Statistical analysis

Due to the complex nature of the SAGE data and to prevent biased estimation, three approaches to data analysis were conducted. The first step was to estimate individual covariates association with the exposure variable (experienced CL) by adopting the Rao-Scott χ^2 test statistic for testing association using a complex survey. The Rao-Scott Chi-square test is design-adjusted based on the correction of the Pearson Chi-square test when using complex survey data. Secondly, significant factors influencing CL were assessed by adopting three statistical models involving Poisson, Logistic and Probit models individually. These models were used to gain a more holistic understanding of the variables significantly influencing the outcome variables [21]. We analyzed multicollinearity among the variables considered by adopting variance inflation factor (VIF) and pairwise correlation. The multicollinearity analysis showed no suspected multicollinearity (mean VIF < 1.3) and, none of the individual variables' pairwise correlation coefficient is ≥ 0.8. Before estimating the log-likelihood ratio and log odds of every CL on poor SRH, the biserial correlation was performed to assess the significant correlation coefficient between CL and SRH. Biserial correlation is appropriate when performing a correlation between two artificial dummy variables to assess the strength and significant relationship. After adopting this approach, the biserial correlation analysis showed a positive correlation between CL and poor SRH with a coefficient value of 0.04 (p = 0.007; Supplementary Data 2). In this observational study, matching was considered for reducing imbalance by selecting a control in a sample (never experienced CL) that

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Table 1: Prevalence of ever experience child labour and associated factors among older adults in Ghana aged > 18 years, SAGE Wave 2, 2014–2015

Variables	Total	Childhood Labour experience		
		Never experience	Ever experience	Rao-Scott $\chi 2$
Prevalence (95% CI)		95.80 (94.80 – 96.60)	4.20 (3.30 – 5.20)	
		Weighted %	Weighted %	
Sex				
Male	1948	95.80	4.20	0.02
Female	2787	95.90	4.10	
Age group				13.45***
18 – 49	1160	96.80	3.20	
50 – 59	1295	92.90	7.10	
60 – 69	1105	92.20	7.80	
70 –79	771	94.70	5.30	
> 80	404	95.80	4.20	
Educational level				17.13***
None	1996	91.50	8.50	
Primary	1354	95.80	4.20	
Secondary	1231	98.20	1.80	
Tertiary	154	99.94	0.06	
Marital status				3.68*
Never married	502	96.60	3.40	
Married	2628	95.10	4.90	
Separated	532	96.20	3.80	
Widowed	1073	93.90	6.10	
Religion				4.19**
None	131	90.80	9.20	
Christian	3455	96.50	3.50	
Islam	885	93.90	6.10	
Primal indigenous	251	95.0	50	
Place of residence				34.57***
Urban	1965	98.0	2.0	
Rural	2770	93.60	6.40	
Region				3.55****
Ashanti	818	96.0	4.0	
Brong Ahafo	521	95.60	4.40	
Central	592	96.10	3.90	
Eastern	365	97.20	2.80	
Greater Accra	492	97.60	2.40	
Northern	471	89.60	10.40	
Upper East	248	97.30	2.70	
Upper West	223	99.70	0.30	
Volta	412	92.70	7.30	
Western	593	97.90	2.10	
Place of birth in locality				2.35
Same	3295	95.40	4.60	
Different	1440	96.70	3.30	
Mother employed				24.23***
No	2154	92.80	7.20	
Yes	2581	97.70	2.30	
Father employed				26.48***
No	2095	92.60	7.40	
Yes	2640	97.70	2.30	

Rao-Scott is a design-based Chi square; p value notation: *, p value < 0.05; **, p value < 0.01; ***, p value < 0.001; CI, confidence interval

had the same covariate values to those in the 'treated' sample (experienced CL) to study the association with certain outcomes (in this study poor SRH) [22]. Coarsened Exact Matching (CEM) method was applied in this procedure. CEM is a Monotonic Imbalance Bounding (MIB) matching method between the 'treated' and 'control' groups to control for the potentially confounding factors influencing the treated outcome [23]. The matching results can be found in Supplementary Data 3. Finally, after pre-processing the data with CEM, the association of ever CL and poor SRH were assessed by adopting Poisson with CEM, Logistic with CEM and Probit with CEM in the final analytical procedure. The analysis was performed using STATA Statistical Software (Version 14, StataCorp LLC, College Station, TX) and $p \leq 0.05$ was deemed significant.

RESULTS

The analysis involved a total of 4735 participants aged ≥ 18 years with a mean (± standard deviation) age of 40.60 (± 15.50). The prevalence of ever experienced CL was 4.20% [95% (confidence interval (CI) = 3.30 – 5.20]. There was a statistically significant association between the prevalence of CL and all covariates studied except sex and place of birth from the Rao-Scott test of significant association for a complex survey (Table 1). The overall prevalence of poor SRH was 15.60% (95% CI = 13.90 – 17.60), however, this was higher among older adults with CL (prevalence = 26.70%; 95% CI = 18.60 – 36.90) as opposed to those without CL (prevalence = 15.1%; 95% CI = 13.40 – 17.10) (Supplementary Data 4). Inferential analysis from Poisson and Logistic Regression estimates showed that age group, educational level, place of residence and geographical location significantly influence CL. Among participants aged 60 – 69 years, the prevalence of CL was 93% higher (over two-folds) compared with those aged 18 – 49 years from Poisson estimations [adjusted Posson ratio (aPR) = 1.93; 95% CI = 1.27 – 2.96] and Logistic Regression analyses [adjusted odds ratio (aOR) = 2.11; 95% CI = 2.11 1.31 – 3.39]. However, the Probit model predicted a significant 43% increased log odd of 'ever CL' for participants aged 60 – 69 years [adjusted beta (aβ) = 0.43; 95% CI = 0.21 – 0.64].

Participants with higher education (≥ secondary school) had lower experiences of CL, compared with older adults with little education (≤ primary education). Older adults with little education had more than a 3-fold likelihood by both Poisson estimates (aPR = 3.49; 95% CI = 1.79 – 6.81) and by Logistic Regression (aOR = 3.86; 95% CI = 3.86 1.89 – 7.89) of ever experiencing CL compared with older adults with higher education. Similarly, the Probit model indicated that little education increased the log odd of ever experiencing CL by 60% compared with higher education (aβ = 0.60; 95% CI = 0.60 0.30 – 0.89). In addition, a rural-urban disparity existed with a significant disadvantage among rural residents. Participants dwelling in rural settings were twice likely to have ever experienced CL. The prevalence of CL among participants residents in the Ashanti, Brong Ahafo, Greater Accra, Northern and Volta were 3 times more compared with residents of the Upper East region (Table 2).

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Table 2: Demographic factors associated with ever experience child labour among Ghanaians aged > 18 years, SAGE Wave 2, 2014–2015

Variable	Poisson	Logistic	Probit
	aPR (95% CI)	aOR (95% CI)	Aβ (95% CI)
Sex			
Male	Ref	Ref	Ref
Female	0.77 (0.51 – 1.16)	0.75 (0.46 – 1.20)	-0.12 (-0.33 – 0.09)
Age group			
18-49	Ref	Ref	Ref
50-59	1.37 (0.85 – 2.21)	1.43 (0.84 –2.45)	0.23 (-0.01 – 0.47)
60-69	1.93 (1.27 –2.96)**	2.11 (1.31– 3.39)**	0.43 (0.21 – 0.64)***
70-79	1.65 (1.02 – 2.65)*	1.75 (1.02 – 2.99)*	0.33 (0.06 – 0.59)*
80+	0.99 (0.55-1.80)	0.99 (0.51– 1.93)	0.08 (-0.24 – 0.40)
Educational level			
Higher	Ref	Ref	Ref
None	3.49 (1.79 – 6.81)***	3.86 (1.89 – 7.89)***	0.60 (0.30 – 0.89)***
Primary	2.49 (1.29 – 4.81)**	2.62 (1.30 – 5.29)**	0.41 (0.12 – 0.70)**
Marital status			
Never married	Ref	Ref	Ref
Married	1.40 (0.71 – 2.77)	1.43 (0.68 – 3.00)	0.18 (-0.13 – 0.49)
Separated	1.26 (0.50 – 3.18)	1.27 (0.46 – 3.53)	0.12 (-0.31 – 0.55)
Widowed	1.35 (0.62 – 2.92)	1.37 (0.59 – 3.20)	0.16 (-0.21 – 0.53)
Religion			
Christian	Ref	Ref	Ref
None	1.57 (0.64 – 3.84)	1.68 (0.58 – 4.88)	0.26 (-0.26 – 0.80)
Islam	1.15 (0.76 – 1.73)	1.16 (0.73 – 1.85)	0.09 (-0.13 – 0.31)
Primal indigenous	0.79 (0.48 – 1.32)	0.77 (0.43 – 1.36)	-0.11 (-0.39 – 0.17)
Place of residence			
Urban	Ref	Ref	Ref
Rural	2.46 (1.50 – 4.03)***	2.65[1.56 – 4.48]***	0.47 (0.25 – 0.69)***
Region			
Upper East	Ref	Ref	Ref
Ashanti	3.52 (1.36 – 9.09)**	3.95 (1.41– 11.07)**	0.66 (0.21 – 1.11)**
Brong Ahafo	3.24 (1.25 – 8.34)*	3.59 (1.29 – 9.92)*	0.61 (0.16 – 1.06)**
Central	2.83 (1.21 – 6.57)*	3.11 (1.26 – 7.63)*	0.53 (0.13 – 0.93)**
Eastern	1.99 (0.41 – 9.66)	2.11 (0.39 –11.33)	0.42 (-0.32 – 1.16)
GT. Accra	3.82 (1.11 – 13.09)*	4.34 (1.16 – 16.30)*	0.68[0.12 – 1.23]*
Northern	4.69 (2.16 – 10.20)***	5.58 (2.40 – 12.93)***	0.83[0.45 – 1.21]***
Upper West	0.10 (0.02 – 0.44)**	0.09 (0.02 – 0.42)**	-0.87 (-1.41 – -0.32)**
Volta	4.34 (1.83 – 10.24)***	4.98 (1.95 – 12.70)***	0.77 (0.34 – 1.20)***
Western	1.76 (0.67– 4.58)	1.87 (0.68 – 5.14)	0.33 (-0.12 – 0.79)
Place of birth			
Same locality	Ref	Ref	Ref
Different locality	0.84 (0.53 – 1.35)	0.83 (0.49 – 1.40)	-0.09 (-0.31 – 0.14)
Mother employed			
No	Ref	Ref	Ref
Yes	0.74 (0.40 – 1.36)	0.72 (0.37 – 1.39)	-0.14 (-0.45 – 1.16)
Father employed			
No	Ref	Ref	Ref
Yes	0.47 (0.27 – 1.81)	0.44 (0.24 – 1.79)	-0.38 (-0.67 – 0.10)

aPR, adjusted Poisson ratio; aOR, adjusted odds ratio; aβ, adjusted beta odds; *p* value notation: *, *p* value < 0.05; **, *p* value < 0.01; ***, *p* value < 0.001; CI, confidence interval

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Table 3: Sensitivity analysis showing Poisson and logistics regression with CEM assessing the impact of ever experience childhood labour on poor SRH among older adults in Ghana, SAGE Wave 2, 2014–2015

Covariate	Poisson	Logistic	Probit
	aPR (95% CI)	aOR (95% CI)	aβ (95% CI)
Experience child labour			
Never CL	Ref	Ref	Ref
Ever CL	1.18 (1.02 – 1.35)**	1.32 (1.04 – 1.68)**	0.16[0.0 – 1-0.31]*
Sex			
Male	Ref	Ref	Ref
Female	0.98 (0.86 – 1.12)	0.97 (0.78 – 1.20)	-0.02[-0.14 – 0.11]
Marital status			
Never married	Ref	Ref	Ref
Married	0.39 (0.27 – 0.58)***	0.31 (0.19 – 0.48)***	-0.65[-0.89 – -0.41]***
Separated	1.37 (1.15 – 1.63)***	1.63 (1.23 – 2.17)***	0.30[0.12 – 0.47]***
Widowed	1.74 (1.52 – 1.99)***	2.51 (2.00 – 3.15)***	0.56[0.42 – 0.70]***
Religion			
Christian	Ref	Ref	Ref
None	1.72 (1.37 – 2.16)***	2.82 (1.64 – 4.83)***	0.63[0.29 – 0.96]***
Islam	0.91 (0.78 – 1.07)	0.87 (0.69 – 1.11)	-0.08[-0.22 – 0.06]
Primal indigenous	1.37 (1.12 – 1.68)**	1.69 (1.18 – 2.43)**	0.32[0.09 – 0.54]**
Place of birth			
Same locality	Ref	Ref	Ref
Different locality	1.17 (1.03 – 1.31)**	1.29 (1.06 – 1.57)**	0.15[0.03 – 0.27]*

aPR, adjusted Poisson ratio; aOR, adjusted odds ratio; aβ, adjusted beta odds; *p* value notation: *, *p* value < 0.05; **, *p* value < 0.01; ***, *p* value < 0.001; CI, confidence interval

It is worth noting that before quantifying the impact of CL on future poor self-rated health, about 43% of imbalance existed among the factors significantly influencing CL. However, after CEM matching, no improved imbalances (8.33×10^{-16} approximately 0%) existed. Controlling for significant factors influencing CL and adjusting for other demographic variables, using Poisson and Logistic regression showed that CL was significantly associated with poor SRH. The prevalence of poor SRH among participants who have ever experienced CL was 41% by Poisson estimations (aPR = 1.41; 95% CI = 1.01 – 1.96) and 47% by Logistic Regression estimation (aOR= 1.47; 95% CI = 1.01 – 2.17) compared to those who have never experienced CL. Analysis from the Probit model also showed that ever experiencing CL significantly increased the log odd of poor SRH by 16% (aβ = 0.16; 95% CI = 0.01 – 0.31) (Table 3). Similarly, other adjusted covariates including marital status, religion and place of birth were significantly associated with poor SRH. The widowed were observed to have > 3-folds increased likelihood (by both Poisson and Logistic estimations) of poor SRH compared with those who never married [(aPR = 3.08; 95% CI = 2.24 – 4.23) and (aOR = 3.50; 95% CI = 2.44 – 5.01)]. Participants with no religion were observed to have > 2-fold increased likelihood of poor SRH compared with Christians [(aPR = 2.03; 95% CI = 1.12 – 3.67) and (aOR = 2.31; 95% CI = 1.08 – 4.96)] (Table 3).

DISCUSSION

Child labour and the early onset of engagement in paid work have persisted in Africa and have assumed greater importance as a major health and social policy issue [24]. The foundation of human capital depends mainly on the proper and well development of children, which then serve as the human capital index of a country [25]. Evidence exists to indicate that child labour (CL) is a significant inhibitor to a country's future human capital [24]. Child labour does not only impact their current health and social wellbeing [26,27,28], it does influence the future health status of these individuals. Generally, the findings of this analysis are in harmony with these observations. The prevalence of ever experiencing child labour was demonstrated in our analysis to be significantly associated with age, educational level, marital status, religion, place of residence, and the geographical location of these adults. Unsurprisingly, the employment statuses of parents (mother and father) during the childhood of this cohort of adults in Ghana were significantly associated with the early onset of paid work. One can thus surmise that the socio-economic environment of these adult Ghanaians during childhood influenced engagement in paid work much earlier on in life. The prevalence of CL among participants who were born between 1941 and 1951 was significantly higher compared with those born later in the 20th century. This observation is potentially due to demographic, epidemiological and social-economic transitions from the pre-independence era. In a typical agrarian economy experienced at the time, children were valuable assets for farm work. Children were involved in working to help their parents run the family farm and not in school [29]. It is amply documented that in the pre-independence era, whole households including millions of children between the ages of 5 - to 14 years in Africa were involved in the labour force [30]. Adults with higher education (secondary level or more) were less likely to have ever experienced CL. This

observation agrees with the notion that keeping children in school for a longer period is a key factor to be considered in preventing child labour. The influence of education on early child labour has been demonstrated in previous studies in Ghana [31,32] and elsewhere [27,30,33]. It is, therefore, imperative that the national government's quest to provide universal and free education up to the secondary level in Ghana is a worthy social and public policy initiative that has the potential to improve the human capital index as well as reap greater demographic dividends within the relatively healthier adult population.

Adults whose childhood and adult years were spent in more rural-less-developed areas of the country were significantly disadvantaged and had a relatively higher likelihood (a two-fold increase) of early onset of engagement in paid work. This observation is in congruence with findings from previous studies in the Ghanaian and other settings on the current place of residence and the relationship with child labour [27,31,32,34]. Equitable distribution of education and social opportunities for the next generation of older adults in Ghana. This study has empirically demonstrated the positive correlation between the experience of CL and poor SRH in adulthood and shows clearly that experience of CL and poor SRH significantly relates to each other. This study demonstrates that experiencing CL during childhood has long-term health consequences. Potentially, the early engagement in a paid job could have curtailed or limited the educational potential with a consequent ill effect on social development. Low-socioeconomic status and place of residence are recognized factors that influence the health status of population groups. This finding conforms with that of Lee and Orazem [12] who established that entering the labour market at an early childhood age consistently hinders future adult health with a high incidence of chronic diseases and disabilities. The outcome variables used for the analysis were self-reported and not s clinical measurements. However, individual SRH has proven to be a good indicator of objective health as well as a sensitive predictor of health care demand [35,17]. In addition, potential recall bias due to the longevity of experiences of the relatively older adults was likely. The WHO SAGE used different methods of data collection on health ratings to limit recall bias. Moreover, even though our analysis adopted a matching procedure, which is highly recommended in observational data with robust analysis, the method did not allow for establishing a causal effect.

Conclusion

A positive relationship existed between early engagement in paid work and the future health status of individuals in this nationally representative study sample. These results reveal another collateral benefit (healthier adult populations) from the national government's quest to provide universal and free education up to the secondary level in Ghana. Equitable distribution of education and social opportunities for the current younger population and children in Ghana will reap several demographic and health dividends.

DECLARATIONS

Ethical considerations

SAGE Wave 2 was approved by the World Health Organization's Ethical Review Board with reference number RPC149, and the Ethical and Protocol Review Committee, of the College of Health Sciences, University of Ghana, Accra, Ghana. Written informed consent was obtained from all study participants.

Consent to publish

All authors agreed to the content of the final paper.

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None

Competing Interests

No potential conflict of interest was reported by the authors.

Author contributions

AA, AEY, JT, PY conceptualized the study and were involved in the research investigations, methodology design, provision of resources, data curation, formal analysis, and writing and reviewing of the manuscript. DG, GM, NM, PK, RB helped to conduct the research investigations, data analysis, and were involved in the writing and reviewing of the manuscript.

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Availability of data

The dataset used to support the findings of this study is available upon request through WHO website: https://apps.who.int/healthinfo/systems/surveydata/index.php/catalog/sage/about.

REFERENCES

1. Ortiz-Ospina E, Roser M Child Labor - Our World in Data. https://ourworldindata.org/child-labor. Accessed 20 Mar 2020
2. International Labour Organization (ILO) Global Estimates of Child Labour: Results and trends, 2012-2016. http://www.ilo.org/global/publications/books/WCMS_575499/lang--en/index.htm. Accessed 20 Mar 2020
3. International Labour Organization (ILO) International Programme on the Elimination of Child Labour (IPEC) (IPEC). https://www.ilo.org/ipec/lang--en/index.htm. Accessed 20 Mar 2022
4. Hamenoo ES, Dwomoh EA, Dako-Gyeke M (2018) Child labour in Ghana: Implications for children's education and health. Child Youth Serv Rev 93:248–254. https://doi.org/10.1016/j.childyouth.2018.07.026
5. International Labour Organization (ILO) What is child labour (IPEC). https://www.ilo.org/ipec/facts/lang--en/index.htm. Accessed 21 Mar 2022

6. Ibrahim A, Abdalla SM, Jafer M, Abdelgadir J, De Vries N (2019) Child labor and health: A systematic literature review of the impacts of child labor on child's health in low- and middle-income countries. J Public Heal (United Kingdom) 41:18–26. https://doi.org/10.1093/pubmed/fdy018

7. Humanium Organization Child Labour. https://www.humanium.org/en/child-labour/. Accessed 21 Mar 2022

8. Roggero P, Mangiaterra V, Bustreo F, Rosati F (2007) The health impact of child labor in developing countries: Evidence from cross-country data. Am J Public Health 97:271–275. https://doi.org/10.2105/AJPH.2005.066829

9. Desai M, Goel S (2018) Child Rights Education for Inclusion and Protection. Springer Singapore, Singapore

10. International Labour Organization. Household Chores and Child Domestic Work (The Care Economy), https://www.ilo.org/global/topics/care-economy/household-chores/lang--en/index.htm (accessed 27 May 2020).

11. Smith JP The impact of childhood health on adult labor market outcomes. https://www.econstor.eu/handle/10419/35379. Accessed 21 Mar 2022

12. Lee C, Orazem PF (2010) Lifetime health consequences of child labor in Brazil. Res Labor Econ 31:99–133. https://doi.org/10.1108/S0147-9121(2010)0000031007

13. Agrawal G, Patel SK, Agarwal AK (2016) Lifestyle health risk factors and multiple non-communicable diseases among the adult population in India: a cross-sectional study. J Public Heal 24:317–324. https://doi.org/10.1007/s10389-016-0727-6

14. Minicuci N, Biritwum RB, Mensah G, Yawson AE, Naidoo N, Chatterji S, Kowal P (2014) Sociodemographic and socioeconomic patterns of chronic non-communicable disease among the older adult population in Ghana. Glob Health Action 7:10. https://doi.org/10.3402/gha.v7.21292

15. World Health Organization (WHO) (2005) WHO's Study on Global AGEing and Adult Health (SAGE). https://www.who.int/data/data-collection-tools/study-on-global-ageing-and-adult-health. Accessed 29 May 2019

16. Kowal P, Chatterji S, Naidoo N, Biritwum R, Fan W, Ridaura RL, Maximova T, Arokiasamy P, Phaswana-Mafuya N, Williams S, Josh Snodgrass J, Minicuci N, D'Este C, Peltzer K, Ties Boerma J, Yawson A, Mensah G, Yong, Newell ML (2012) Data resource profile: The world health organization study on global ageing and adult health (SAGE). Int J Epidemiol 41:1639–1649. https://doi.org/10.1093/ije/dys210

17. Tetteh J, Kogi R, Yawson AO, Mensah G, Biritwum R, Yawson AE (2019) Effect of self-rated health status on functioning difficulties among older adults in Ghana: Coarsened exact matching method of analysis of the World Health Organization's study on global AGEing and adult health, Wave 2. PLoS One 14:e0224327 . https://doi.org/10.1371/journal.pone.0224327

18. Duboz P, Boëtsch G, Gueye L, Macia E (2017) Self-rated health in Senegal: A comparison between urban and rural areas. PLoS One 12:e0184416. https://doi.org/10.1371/journal.pone.0184416

19. Saevareid HI, Thygesen E, Nygaard HA, Lindstrom TC (2007) Does sense of coherence affect the relationship between self-rated health and health status in a sample of community-dwelling frail elderly people? Aging Ment Health 11:658–667. https://doi.org/10.1080/13607860701368513

20. Government of Ghana, UNESCO (2016) The Children's Act, 1998. Libr Inf Updat 4:32–33

21. Cleophas TJ, Zwinderman AH (2016) Poisson Regression for Binary Outcomes (52 Patients). In: SPSS for Starters and 2nd Levelers. pp 273–277

22. Rubin DB, Thomas N (2000) Combining propensity score matching with additional adjustments for prognostic covariates. J Am Stat Assoc 95:573–585. https://doi.org/10.1080/01621459.2000.10474233

23. Iacus S, King G, Porro G CEM: Coarsened Exact Matching Software. https://gking.harvard.edu/cem. Accessed 21 Mar 2022

24. Radfar A, Asgharzadeh SA, Quesada F, Filip I (2018) Challenges and perspectives of child labor. Ind Psychiatry J. https://doi.org/10.4103/ipj.ipj_105_14

25. Singha A, Saikia P (2018) Facts and Magnitude of Child Labour. Int J Econ Manag Strateg 8:1–7

26. Homaie Rad E, Gholampoor H, Jaafaripooyan E (2015) Child labor and the influencing factors: Evidence from less developed provinces of Iran. Iran J Public Health 44:1244–1252

27. Khatab K, Raheem MA, Sartorius B, Ismail M (2019) Prevalence and risk factors for child labour and violence against children in Egypt using Bayesian geospatial modelling with multiple imputation. PLoS One 14:e0212715. https://doi.org/10.1371/journal.pone.0212715

28. Heady C (2000) What is the effect of child labour on learning achievement? Evidence from Ghana. Innocenti Work Pap NO. 79

29. Agbu O (2009) Children and Youth in the Labour Process in Africa. In: Proj. MUSE. https://muse.jhu.edu/book/16811. Accessed 21 Mar 2022

30. Bass LE (2004) Child labor in sub-Saharan Africa. Lynne Rienner Publications. pp. 30–43

31. Afriyie LT, Saeed BII, Alhassan A (2019) Determinants of child labour practices in Ghana. J Public Heal 27:211–217. https://doi.org/10.1007/s10389-018-0935-3

32. Fuseini T, Daniel M (2020) Child begging, as a manifestation of child labour in Dagbon of Northern Ghana, the perspectives of mallams and parents. Child Youth Serv Rev 111:104836. https://doi.org/10.1016/j.childyouth.2020.104836

33. Khatab K, Adegboye O, Mohammed TI (2016) Social and Demographic Factors Associated with Morbidities in Young Children in Egypt: A Bayesian Geo-Additive Semi-Parametric Multinomial Model. PLoS One 11:e0159173. https://doi.org/10.1371/journal.pone.0159173

34. Yıldırım B, Beydili E, Görgülü M (2015) The Effects of Education System on to the Child Labour: An Evaluation from the Social Work Perspective. Procedia - Soc Behav Sci 174:518–522 . https://doi.org/10.1016/j.sbspro.2015.01.697

35. Omokhodion FO, Omokhodion SI, Odusote TO (2006) Perceptions of child labour among working children in Ibadan, Nigeria. Child Care Health Dev 32:281–286. https://doi.org/10.1111/j.1365-2214.2006.00585.x

36. Mbebi OE (2018) Determinants of child labour in Cameroon: The role of area of residence and gender. Rev. Econ. Dev. 26:5–52

37. Chola L, Alaba O (2013) Association of Neighbourhood and Individual Social Capital, Neighbourhood Economic Deprivation and Self-Rated Health in South Africa - a Multi-Level Analysis. PLoS One 8:e71085. https://doi.org/10.1371/ journal.pone. 0071085

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Supplementary Data 1: Variable definitions

Variable	Type of variable	Description	Measurement	Scale of measurement	Number of responses/ Missing
Ever experience child labour	Secondary outcome variable	Participants were asked at what age they started working for pay in their life	Raw ages reclassified into <15 years and 15+ years	Artificial binary	4735/0
Self-rated health	Primary outcome variable	Participants were asked; in general, how would you rate your health today?	Very good, good, moderate, bad and every bad. Reclassified into Good and Poor	Artificial binary	4735/0
Sex of participant,	Explanatory variable	Sex deferential of participant	Male or Female	Binary	4735/0
Age group	Explanatory variable	Age of participant as at data collection	Raw ages recoded into <50, 50-59, 60-69, 70-79 and 80+	Discrete Categorical	4735/0
Educational level	Explanatory variable	Highest educational level of participants	Recoded into None, primary, secondary and tertiary	Categorical	4735/0
Marital status	Explanatory variable	Current marital status of participants	Recoded as never married, married, separated/divorced and widowed	Categorical	4735/0
Religion	Explanatory variable	Religious affiliation of participants	Recoded as none, Christian, Islam and Primal indigenous (traditionalist)	Categorical	4722/13
Place of residence	Explanatory variable	Place where participants resides	Urban and rural	Binary	4735/0
Region	Explanatory variable	The then region where participant lives	Ashanti, Brong Ahafo, Central, Eastern, GT Accra, Northern, Upper East, Upper West, Volta and Western	Categorical	4735/0
Place of birth	Explanatory variable	Participants were asked where they were born	Reclassified into Same locality and Different locality	Artificial binary	4718/17
Mother employed	Explanatory variable	Mother ever schooled from SAGE question “What is the highest level of education that mother completed?”	Yes or No	Artificial binary	4735/0
Father employed	Explanatory variable	Father ever schooled from SAGE “What is the highest level of education that father completed?”	Yes or No	Artificial binary	4735/0

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Supplementary Data 2: CEM, coarsened Exact Matching weighted balancing summary statistics of before and after matching

Co-variate matched	Before matching		After matching	
	L1	mean	L1	mean
Age group	0.11	0.12	1.10×10^{-15}	-5.60×10^{-15}
Education	0.18	-0.39	1.80×10^{-15}	4.90×10^{-15}
Place of residence	0.13	0.13	3.90×10^{-15}	7.10×10^{-15}
region	0.19	-0.03	9.40×10^{-15}	-2.20×10^{-15}
Overall	43.00		8.33×10^{-16}	

NOTE: *L1, perfect global balance up to coarsening. Total match sample among the treatment (ever experience CL) = 336. Total match sample among controls (never experience CL) = 2761.

Supplementary Data 3: Pairwise correlation between ever ECL and poor SRH

Variable	Poor SRH	*p* value
Ever ECL	0.04	0.007

*ECL, ever experience CL; SRH, self-reported health

Supplementary Data 4: Prevalence of poor SRH by ECL

Variable	Proportion (95% CI)
Ever ECL	26.7 (18.6 - 36.9)
Never ECL	15.1 (13.4 - 17.1)
Overall	15.6 (13.9 - 17.6)

*ECL, ever experience CL; SRH, self-reported health