Published in final edited form as:

AIDS. 2019 June 01; 33(Suppl 1): S29–S34. doi:10.1097/QAD.0000000000002177.

Resilience and psychosocial outcomes among South African adolescents affected by HIV

Caroline KUO,

Brown University School of Public Health, Department of Behavioral and Social Sciences;
Providence/Boston Center for AIDS Research; University of Cape Town, Department of
Psychiatry and Mental Health

Ashleigh LOVETTE,

Brown University School of Public Health, Department of Behavioral and Social Sciences

Jennifer PELLOWSKI,

Brown University School of Public Health, Department of Behavioral and Social Sciences

Abigail HARRISON,

Brown University School of Public Health, Department of Behavioral and Social Sciences

Catherine MATHEWS,

South African Medical Research Council, Health Systems Research Unit

Don OPERARIO,

Brown University School of Public Health, Department of Behavioral and Social Sciences;
Providence/Boston Center for AIDS Research

William BEARDSLEE,

Boston Children's Hospital & Judge Baker Children's Center & Harvard Medical School,
Department of Psychiatry

Dan J. STEIN,

University of Cape Town, Department of Psychiatry and Mental Health and South African MRC
Unit on Risk & Resilience in Mental Disorders

Larry BROWN

Alpert Medical School of Brown University, Department of Psychiatry and Mental Health;
Providence/Boston Center for AIDS Research

Abstract

Objective: In South Africa, adolescents account for the largest share of new HIV infections. Given the scale of the epidemic, millions of adolescents cope with familial HIV illness and AIDS orphanhood. Developing an understanding of adolescent resilience is vital for informing HIV and mental health prevention efforts.

Corresponding Author: Caroline Kuo, 121 South Main Street, Providence, Rhode Island, 02903, USA, caroline_kuo@brown.edu.

Author's contributions

CK, CM, DO, WB, DS, and LB developed the original idea to conduct this study including the methods for the study and completion of data collection. AL, JP, and AH contributed to data analysis. All authors drafted and revised the manuscript.

Design: A cross-sectional survey of N=195 South African adolescents, 13–15 years, and living in communities with high prevalence of HIV and poor mental health, was used to gather data on resilience, psychosocial factors, and mental health.

Methods: Participants were recruited through systematic community-based household sampling. Analysis was conducted on a subsample of adolescents identified as potentially vulnerable (n=82); potential vulnerability was defined as adolescents living with HIV, residing with parents or caregivers living with HIV, or experiencing orphanhood. Differences on behavioral and psychosocial outcomes in those with higher and lower resilience were evaluated using SPSS software.

Results: Among adolescents identified as potentially vulnerable (n=82), those with higher resilience scores reported significantly lower behavioral problems using the total difficulties Strength and Difficulties Questionnaire (SDQ) score ($p<0.01$) with a mean score difference of 2.76 (SE=1.02). Multivariate linear regressions were conducted with total difficulties SDQ score as the dependent variable. Higher resilience among vulnerable youth was significantly associated with fewer behavioral problems ($\beta=-0.229$, $p<0.05$), even after adjusting for variables that could also contribute to poor behavioral outcomes.

Conclusions: Resilience is related to the behavioral health of vulnerable HIV-affected adolescents. Resilience-focused interventions hold promise for improving the behavioral health of adolescents living in high HIV prevalence settings.

Keywords

HIV; resilience; adolescents; behavior; mental health

Introduction

Globally, 36.7 million people aged 15 and older are living with HIV, with the largest proportion (19.4 million) living in Eastern and Southern Africa [1]. South Africa faces the largest country HIV epidemic, with 7.1 million South Africans aged 15 and older living with HIV. The HIV epidemic disproportionately affects adolescents. Adolescents and young people aged 15–24 account for 45% of all new HIV infections worldwide [1]. In South Africa alone, there are approximately 270,000 new infections annually, with 12,000 of these new cases occurring among children and adolescents. Many more adolescents are impacted by HIV via familial illness and orphanhood [1]. These varied experiences of HIV – living with HIV, familial HIV, and orphanhood due to AIDS – are associated with increased risk for a range of poor psychological and behavioral outcomes [2–4]. However, poor outcomes are not guaranteed. For example, some studies show no differences among children orphaned by AIDS versus children orphaned by other causes in regards to functioning in school and behaviors such as delinquency [5].

Efforts to understand the impact of HIV and to attenuate the subsequent risks associated with living with HIV, familial HIV, and AIDS orphanhood have been primarily studied using risk-focused frameworks. The use of strength-based approaches to study adolescent health in contexts of risk can offer important insights into future intervention, policy, and programmatic efforts to support this generation of young people [6, 7]. One strategy for

developing strength-based approaches to support adolescents living in contexts of risk includes the study of resilience. A focus on resilience draws attention to the resources, both individual and social, that facilitate positive health outcomes in contexts of adversity [8]. Broadly defined, resilience is the capacity to “adapt successfully to disturbances that threaten system function, viability, or development” and can involve multi-faceted processes of thriving in the face of adversity, or vulnerability [9]. A resilience focus offers a valuable approach towards the study of how to reduce the negative impact of the HIV epidemic on adolescents [9–11]. However, current research provides little evidence on how resilience relates to psychological and behavioral outcomes of adolescents infected and affected by HIV. Some studies have broadly reviewed and framed the concept of resilience among HIV-affected adolescents [12–14]. We identified only one South African study that examined resilience and positive outcomes among perinatally infected adolescents. This study identified household factors, relational aspects with parents or other caregivers, and self-regulation as important mechanisms of resilience linked to positive psychosocial and behavioral outcomes [15]. There is a clear gap in our understanding of resilience among South African adolescents living with HIV, experiencing familial HIV, and affected by orphanhood.

In order to adapt and design age and developmentally-appropriate interventions and programming to improve adolescent health, we need to build our scientific understanding of how potentially vulnerable adolescents thrive in the context of risk. To improve our understanding of resilience among South African adolescents affected by HIV, this study aimed to assess differences in behavioral and psychosocial outcomes based on resilience, and then determined the association(s) between resilience, and psychological and behavioral outcomes. By understanding how positive health outcomes are achieved in the face of vulnerability, we can introduce much needed contextually relevant HIV prevention efforts for this critical population [16].

Methods

In order to determine the relationship between resilience, and psychological and behavioral outcomes, we analyzed data from a sample of N=195 South African adolescents aged 13–15 years. This data was derived from a baseline cross-sectional survey of an intervention study designed to reduce sexual risk behaviors and depressive symptoms among adolescents. The intervention, *Our Family Our Future*, a resilience-focused family intervention, was piloted for feasibility and acceptability in a two-arm parallel randomized design with wait-list control, and outcome assessments at baseline, 1- and 3-months ([ClinicalTrials.gov](https://clinicaltrials.gov)). Details regarding intervention development are reported elsewhere [17]. The intervention study took place in Khayelitsha, South Africa from 2011–2017. Khayelitsha is an urban township located outside the city of Cape Town. The reported antenatal HIV prevalence in Khayelitsha is approximately 33% [18].

To participate in the study, adolescents had to meet the following inclusion criteria: 13–15 years old at the time of screening for recruitment; a score of 9 and 15 on the Center for Epidemiologic Studies depression measure; caregivers that also met this score criteria; informed parental consent and adolescent assent. Participants were recruited through

systematic house-to-house sampling. Adolescents (and caregivers) with a score of 16, which is indicative of significant levels of depressive symptoms, were excluded from study participation as the focus of the study was prevention, as opposed to treatment. Data were self-reported and collected from participants via smartphones with audio computer-assisted self-interviewing software to reduce reporting bias. All study procedures and protocols were approved by ethical committees (Brown University Protocol #1207000666, University of Cape Town Protocol # 072/2013 and 796/2014).

Measures

The baseline cross-sectional survey included sociodemographic, behavioral, and psychological measures. All of the measures have been previously translated, and back translated to isiXhosa, the language spoken most frequently by those living in the study area. Behavioral outcomes were measured using the Strengths and Difficulties Questionnaire (SDQ), while psychological outcomes were measured using the Center for Epidemiological Studies Depression Scale for Children (CES-DC), and items from the Revised Children's Manifest Anxiety Scale (RCMAS). Social support was measured using the Multidimensional Scale of Perceived Social Support (MSPSS). Resilience was measured using the 10-item version of the Connor-Davidson Resilience Scale (CD-RISC 10). All measures had strong psychometric properties (Cronbach's alpha internal reliability scores ranged from $\alpha = 0.74$ to 0.92), have been used with similar populations in South Africa, or have been validated for use in Africa [19–23].

Analysis

Literature has provided evidence to support the idea that being affected by HIV is not limited solely to an individual's HIV-status, particularly in the case of children and adolescents [24–26]. Adolescent participants who were living with HIV, had caregivers living with HIV, or who had experienced orphanhood were categorized as HIV-affected, or potentially vulnerable. We were intentional about not labelling a broad set of individuals as vulnerable, and agreed upon the term “potentially vulnerable” as one that more appropriately conveys that adolescents affected by HIV may face elevated risks for poor outcomes, but poor outcomes are not assured. Our analysis focused on: (1) evaluating differences in behavioral and psychological outcomes based on median-split resilience scores; and (2) determining the relationship between resilience, and psychological and behavioral outcomes. We tested for normality of the outcome variables and corrections were made if necessary. We constructed a linear regression analysis to examine the bivariate association between resilience and psychological and behavioral outcomes. We conducted further analysis on any significant associations between resilience and psychological and behavioral outcomes through an adjusted model using multivariate linear regression. These models included sociodemographic variables (i.e. age, sex, and housing-type) as well as variables that may also account for the outcome of interest to adjust for potential confounding. We declared the findings as statistically significant if the corresponding p -values were ≤ 0.05 . All analysis was completed using SPSS Statistics 24 software.

Results

Participant characteristics

The mean adolescent age was 14.17 (SD=0.81); 55.9% of adolescents identified as female and 44.1% of adolescents identified as male. More than one-third of the sample was affected by HIV (i.e., living with HIV, experience of parent/caregiver HIV illness, and/or orphaned by AIDS). Detailed demographic characteristics and additional psychological characteristics are presented in Table 1.

Resilience among HIV-affected and non-affected adolescents

To operationalize this concept of potential vulnerability, the sample of N=195 adolescents was split into potentially vulnerable (defined as HIV-affected adolescent participants or who were living with HIV, had caregivers living with HIV, or who had experienced orphanhood) and not-potentially vulnerable groups.

To proceed with analysis based on the concept of resilience as thriving in the face of vulnerability or risk, participants were also dichotomized into high and low resilience groups based on median-split CD-RISC score. The median-split resilience score for this sample was 24.5 (out of a possible total score of 40, with higher scores reflecting higher resilience), resulting in four possible categories for participants: potentially vulnerable and high resilience (n=45); potentially vulnerable and low resilience (n=37); not-potentially vulnerable and high resilience (n=55); not-potentially vulnerable and low resilience (n=58). (See Fig. 1 for a visual depiction of these categories used for analysis).

Assessing differences in behavioral and psychological outcomes

Of the n=82 adolescents identified as potentially vulnerable (See Fig. 1), those with higher resilience scores reported significantly lower behavioral problems using the total difficulties SDQ score ($p=0.009$) with a mean score difference of 2.76 (SE: 1.02). On SDQ difficulties sub-scales, potentially vulnerable, but highly resilient adolescents reported less conduct problems ($p=0.006$), less hyperactivity and inattention ($p=0.022$), and less peer relationship problems ($p=0.03$). However, there were no significant differences on the emotional symptoms SDQ sub-scale, overall depression scores (as measured by CES-DC), or overall anxiety scores (as measured by RCMAS).

Results are also reported for the n=113 adolescents identified as not potentially vulnerable. Among these adolescents, there were also significant differences between those with high and low resilience scores in regards to total difficulties SDQ scores ($p=0.038$). However, none of the SDQ sub-scales were significantly different.

Determining associations between resilience and behavioral and psychological outcomes

Factors closely associated with behavioral outcomes within the sample, and within current literature, were included to ascertain if higher resiliency among potentially vulnerable youth would still be associated with lower behavioral problems. These factors included sociodemographic characteristics (i.e. age, sex, housing type), household food insecurity as reported by the adolescent, and perceived social support of parents, peers, and significant

others. Multivariable linear regressions were conducted with total SDQ score as the dependent variable. Results indicated that higher resilience among vulnerable youth was significantly associated with fewer behavioral problems ($\beta=-0.229$, $p<0.05$), even after adjusting for possible confounders. A numerical summary of the results of these regressions is found in Table 2.

Within the model, it is also worth noting older adolescents reported significantly fewer behavioral problems, when compared to younger adolescents ($\beta=-0.150$, $p<0.05$). Similarly, older adolescents reported significantly higher social support from significant others, when compared to younger adolescents ($\beta=-0.541$, $p<0.01$). Results also indicate food insecurity was significantly associated with an increase in behavioral problems ($\beta=0.174$, $p<0.05$).

Discussion

This study examined the psychological and behavioral impact of the HIV epidemic on South African adolescents. Findings indicate that higher resilience is associated with better behavioral health outcomes – including less conduct problems, hyperactivity and inattention, and peer relationship problems – among potentially vulnerable HIV-affected adolescents. The differences in behavioral outcomes based on levels of resiliency can help guide the development of new approaches for HIV prevention, care, and support as well as mental health promotion efforts. These findings indicate that intervention approaches focused on bolstering resilience among HIV-affected adolescents may help improve behavioral outcomes. Incorporating these insights into existing and future intervention approaches for HIV-affected adolescents complement the range of existing risk reduction-focused approaches.

There are emerging examples of resilience interventions under development for adolescents in low- and middle-income country settings affected by HIV [27, 28]. However, much more work needs to be done to build this scientific evidence base. Promising areas for future resilience research includes the following. First, adolescent resilience needs to be understood within the context of their family and peer systems. As such, we need to develop our understanding of the relational aspects of resilience including how family members can contribute to strengthening resilience among adolescents. Second, we need to explore multi-level resilience bolstering interventions. For example, interventions that tackle individual resilience, relationships that support resilience, and community or structural supports for resilience. While this study focused primarily on individual resilience, examining other aspects of resilience will help to inform a more robust set of interventions within an adolescent's environment. Third, tailoring may be needed. For example, the developmental milestones that adolescents reach in a short number of years mean that different approaches are required for differently aged adolescents. Similarly, HIV illness, family illness, and AIDS orphanhood may impact resilience in different ways and require different types of interventions to protect and improve resilience.

Limitations

While results are promising, a number of limitations deserve acknowledgement. The analysis used cross-sectional data, which does not allow us to make assumptions about

temporal associations, or how resilience may change or influence outcomes over time. Khayelitsha, the site of study, is a community with access to free public health services as well as programming through a number of community-based organizations; it is possible that these organizations may impact the context in which resilience develops in the study population. Additionally, the analysis was based on a small sample size. Also, due to inclusion criteria-related to depressive symptoms, results may be different among a less depressed adolescent population. The elevated level of depressive symptoms within the sample may explain why there were no significant associations between lower resilience, and increased depression and anxiety.

Conclusion

This study provides empirical evidence for a relationship between resilience and behavioral outcomes. Future research can deepen our understanding of resilience among adolescents affected by HIV through longitudinal examination, study of other aspects of resilience (e.g., how relationships contribute to resilience) and development and testing of resilience-focused interventions. Further investigation is needed to understand if a relationship exists between resilience and other positive health outcomes among HIV-affected adolescents (e.g. treatment adherence). Future research on resilience and health outcomes can inform HIV and mental health prevention efforts for potentially vulnerable adolescents by identifying age and developmentally-specific mechanisms of resilience.

Funding:

This work was supported by the National Institutes of Health through the National Institute of Mental Health under Grants K01MH096646, L30MH098313, T32MH078788, the National Institute of General Medical Sciences under Grant R25GM083270, and the Eunice Kennedy Shriver National Institute of Child Health and Human Development under Grant R24HD077976.

References

1. UNAIDS. UNAIDS Data 2017. In. Geneva 2017.
2. Vreeman RC, McCoy BM, Lee S. Mental health challenges among adolescents living with HIV. *Journal of the International AIDS Society* 2017; 20(Suppl 3):21497. [PubMed: 28530045]
3. Chi P, Li X. Impact of parental HIV/AIDS on children's psychological well-being: A systematic review of global literature. *AIDS and Behavior* 2013; 17(7):2554–2574. [PubMed: 22972606]
4. Operario D, Underhill K, Chuong C, Cluver L. HIV infection and sexual risk behaviour among youth who have experienced orphanhood: systematic review and meta-analysis. *Journal of the International AIDS Society* 2011; 14(25).
5. Sharp C, Jardin C, Marais L, Boivin M. Orphanhood by AIDS-Related Causes and Child Mental Health: A Developmental Psychopathology Approach. *J HIV AIDS* 2015; 1(3):114.
6. Plourde KF, Fischer S, Cunningham J, Brady K, McCarragher DR. Improving the paradigm of approaches to adolescent sexual and reproductive health. *Reproductive health* 2016; 13:72. [PubMed: 27296400]
7. Zimmerman MA. Resiliency Theory: A Strengths-Based Approach to Research and Practice for Adolescent Health(). *Health education & behavior : the official publication of the Society for Public Health Education* 2013; 40(4):381–383. [PubMed: 23863911]
8. Skala K, Bruckner T. Beating the odds: an approach to the topic of resilience in children and adolescents. *neuropsychiatrie* 2014; 28(4):208–217. [PubMed: 25413940]
9. Masten AS. Global Perspectives on Resilience in Children and Youth. *Child Development* 2014; 85(1):6–20. [PubMed: 24341286]

10. RUTTER M. Implications of Resilience Concepts for Scientific Understanding. *Annals of the New York Academy of Sciences* 2006; 1094(1):1–12.
11. Ungar M. Researching and theorizing resilience across cultures and contexts. *Preventive Medicine* 2012; 55(5):387–389. [PubMed: 22884666]
12. Betancourt TS, Meyers-Ohki SE, Charrow A, Hansen N. Annual Research Review: Mental health and resilience in HIV/AIDS-affected children – a review of the literature and recommendations for future research. *Journal of Child Psychology and Psychiatry* 2013; 54(4):423–444. [PubMed: 22943414]
13. Li X, Chi P, Sherr L, Cluver L, Stanton B. Psychological Resilience among Children Affected by Parental HIV/AIDS: A Conceptual Framework. *Health psychology and behavioral medicine* 2015; 3(1):217–235. [PubMed: 26716068]
14. Theron LC, Theron A. A critical review of studies of South African youth resilience, 1990–2008. *South African Journal of Science* 2010; 106(7–8):1–8.
15. Bhana A, Mellins CA, Small L, Nestadt DF, Leu C-S, Petersen I, et al. Resilience in perinatal HIV + adolescents in South Africa. *AIDS Care* 2016; 28(sup2):49–59. [PubMed: 27391999]
16. Idele P, Gillespie A, Porth T, Suzuki C, Mahy M, Kasedde S, et al. Epidemiology of HIV and AIDS Among Adolescents: Current Status, Inequities, and Data Gaps. *JAIDS Journal of Acquired Immune Deficiency Syndromes* 2014; 66:S144–S153. [PubMed: 24918590]
17. Kuo C, Atujuna M, Mathews C, Stein DJ, Hoare J, Beardslee W, et al. Developing family interventions for adolescent HIV prevention in South Africa. *AIDS Care* 2016; 28 Suppl 1:106–110.
18. Shisana O, Rehle T, LC S, Zuma K, Jooste S, N Z, et al. South African National HIV Prevalence, Incidence and Behaviour Survey, 2012. In. Cape Town: HSRC Press; 2014.
19. Hoosen N, Davids E, de Vries P, Shung-King M. The Strengths and Difficulties Questionnaire (SDQ) in Africa: a scoping review of its application and validation. *Child Adolesc Psychiatry Ment Health* 2018; 12(6):11. [PubMed: 29436523]
20. Baron EC, Davies T, Lund C. Validation of the 10-item Centre for Epidemiological Studies Depression Scale (CES-D-10) in Zulu, Xhosa and Afrikaans populations in South Africa. *BMC Psychiatry* 2017; 17(1):6. [PubMed: 28068955]
21. Lowenthal E, Lawler K, Harari N, Moamogwe L, Masunge J, Masedi M, et al. Validation of the Pediatric Symptom Checklist in HIV-infected Batswana. *Journal of Child & Adolescent Mental Health* 2011; 23(1):17–28.
22. Stewart RC, Umar E, Tomenson B, Creed F. Validation of the multi-dimensional scale of perceived social support (MSPSS) and the relationship between social support, intimate partner violence and antenatal depression in Malawi. *BMC Psychiatry* 2014; 14(1):180. [PubMed: 24938124]
23. Jorgensen IE, Seedat S. Factor structure of the Connor-Davidson resilience scale in South African adolescents. *International journal of adolescent medicine and health* 2008; 20(1):23–32. [PubMed: 18540281]
24. King E, De Silva M, Stein A, Patel V. Interventions for improving the psychosocial well-being of children affected by HIV and AIDS. *Cochrane Database of Systematic Reviews* 2009; (2).
25. Kuo C, Operario D. Health of adults caring for orphaned children in an HIV endemic community in South Africa. *AIDS Care* 2010; 5(4):344–352.
26. Richter L, Sherr L, Adato M, Belsey M, Chandan U, Desmond C, et al. Strengthening families to support children affected by HIV and AIDS. *AIDS Care* 2009; 21(Supplement 1):3–12. [PubMed: 22380973]
27. Eloff I, Finestone M, Makin JD, Boevig-Allen A, Visser M, Ebersohn L, et al. A randomized clinical trial of an intervention to promote resilience in young children of HIV-positive mothers in South Africa. *Aids* 2014; 28 Suppl 3:S347–357.
28. Leventhal KS, Gillham J, DeMaria L, Andrew G, Peabody J, Leventhal S. Building psychosocial assets and wellbeing among adolescent girls: A randomized controlled trial. *Journal of Adolescence* 2015; 45:284–295. [PubMed: 26547145]

	Potentially Vulnerable	Not Vulnerable	Potentially
Low Resilience	37	58	
High Resilience	45	55	

Figure 1.
Study sample based on potential vulnerability and resilience

Table 1.

Socio-demographic characteristics among adolescents in Khayelitsha, South Africa (N=195)

	Frequency (percent)	Mean (SD)
Sex		
Female	109 (55.9)	
Male	86 (44.1)	
Age (mean, SD)		14.17 (0.82)
Race/Ethnicity		
Black African	195 (100)	
Language		
isiXhosa	194 (99.5)	
English	1 (0.5)	
Housing Type ^a		
Informal (e.g. shack, tent)	113 (58.2)	
Formal (e.g. house, traditional hut, flat)	81 (41.8)	
Education		
Current Enrollment	189 (96.9)	
Highest Completed Grade		
Grade 4/Std 2	3 (1.5)	
Grade 5/Std 3/ABET 2	4 (2.1)	
Grade 6/Std 4	18 (9.2)	
Grade 7/Std 5/ ABET 3	48 (24.6)	
Grade 8/ Std 6/Form 1	62 (31.8)	
Grade 9/ Std 7/ Form 2/ABET 4	47 (24.1)	
Grade 10/ Std 8/ Form 3	12 (6.2)	
Grade 11/Std 9/ Form 4	1 (0.5)	
Food insecurity	119 (61)	
Adolescent living with HIV	8 (4.1)	
Parent/Caregiver living with HIV	57 (28.8)	
Adolescents experiencing orphanhood ^b	34 (17.4)	
Total Difficulties Score (SDQ)		10.69 (5.78)
Depression Score (CES-DC) ^c		11.71 (1.99)
Anxiety Score (RCMAS)		2.81 (2.43)
Resilience Score (CD-RISC)		23.99 (9.14)

^aN=194 for adolescents due to 1 missing value^bIncludes adolescents experiencing orphanhood from the death of at least one parent^cN= 192 for adolescents due to 3 missing values

Acronyms: SD= Standard Deviation

Table 2.

Multivariate regression model of behavioral difficulties in South African adolescents (N=195)

Variable	Outcome: difficulties SDQ score		
	Unstandardized β (SE)	Standardized β (t-score)	p-value
Median Split-Resilience Score	-2.614 (0.831)	-.229 (-3.146)	0.043 *
<i><u>Sociodemographics</u></i>			
Sex ^a	-0.20 (0.815)	-.002 (-0.24)	0.981
Age	-1.040 (0.497)	-0.150 (-2.091)	0.038 *
Housing Type ^b	0.098 (0.823)	0.008 (0.119)	0.905
Food Insecurity ^c	2.041 (0.875)	0.174 (2.331)	0.021 *
<i><u>Social Support Scores</u></i>			
Family	0.331 (0.216)	0.295 (1.527)	0.129
Friends	-0.51 (0.065)	-0.064 (-.794)	0.428
Significant Other	-0.627 (0.220)	-0.541 (-2.849)	0.005 **

* Denotes significance at $p < 0.05$ level** Denotes significance at $p < 0.01$ level^a 0=Female, 1=Male^b 1=Formal, 2=Informal^c Do you ever cut the size of meals or skip meals because there is not enough money for food?; 0=No, 1= Yes

Acronyms: SE= Standard Error