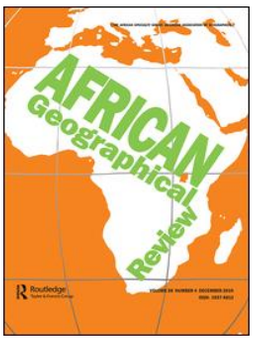

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Examining the effects of household food insecurity on school absenteeism among Junior High School students: findings from the 2012 Ghana global school-based student health survey

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ABSTRACT

This study examined the effects of household food insecurity on school absenteeism among Junior High School students in Ghana. Data for this study were drawn from the 2012 Ghana Global School-based Health Survey. A sample of 1,121 students aged 11–18 years were analyzed using binary logistic regression with school absenteeism as the outcome variable. Of the 1,121 students examined, more than half (58.1%) were from food insecure households and 39.8% missed school without permission during the past 30 days. Adjustng for multiple predictors, students from food insecure households had 1.56 times higher odds of missing school without permission relative to those from food secure households. Other predictors of school absenteeism include being a victim of bullying, being involved in fighting in school, feeling lonely, history of suicidal ideation, alcohol use, and illicit substance use. Parental support had a protective effect on school absenteeism such that, for each additional increase in parental support score, the odds of school absenteeism were predicted to decrease by 4%. Addressing both distal and structural drivers of food insecurity is critical in reducing school absenteeism and improving student enrollment and school attendance.

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Household food insecurity; school absenteeism; student enrolment; junior high school; Ghana

1. Introduction

School absenteeism among children and adolescents is a pervasive problem in Ghana. Absenteeism occurs at all school levels and has been identified as a major concern by school teachers, the Ghana Education Service (GES), policy makers, and researchers (Asante, Kugbey, Osafo, Quarshie, & Sarfo, 2017). In Ghana, although 105.0% and 82.20% Gross Enrolment Ratios (GERs) were recorded at the primary and Junior High School (JHS) levels respectively by the 2012/13 academic year, the Net Attendance Ratio (NAR) at the JHS level for the 2012/13 academic year was 41.00% (United Nations Educational, Scientific, and Cultural Organization, 2014).

School absenteeism has been defined as skipping school without parental consent (Flannery, Frank, & Kato, 2012). Other scholars define school absenteeism in reference to excusable or inexcusable absences from school (Kearney, 2008). Excusable absences generally relates to medical illness or injury that is often accompanied by a doctor's note and or parental consent for the absence whereas inexcusable absences often relates to refusal to attend school without permission

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(Kearney, 2008). These definitions are mostly employed by North American and European scholars (Birioukov, 2016). For the purposes of this study, school absenteeism is defined in reference to being absent from school during the past 30 days without permission from school authorities. The extant literature suggests that school absenteeism is a major predictor of school dropout (Freeman & Simonsen, 2015; Van Eck, Johnson, Bettencourt, & Johnson, 2017), poor academic performance (Aucejo & Romano, 2016), and decreased probability of graduation (Smerillo, Reynolds, Temple, & Ou, 2018). As such, school absenteeism remains an important issue for parents, teachers, researchers, and policy makers.

Prior research suggests that adverse childhood experiences (ACEs) which is often defined as the experience of traumatic events in childhood relating to abuse, neglect, and household dysfunction (Anda et al., 2006) are associated with school absenteeism (Hagborg, Berglund, & Fahlke, 2018; Stempel, Cox-Martin, Bronsert, Dickinson, & Allison, 2017). Stempel et al. (2017) in their study found that having one or more ACEs increased the odds of school absenteeism by 35% with stronger association for children experiencing two or more ACEs. Other risk factors that have been found to predict school absenteeism include being involved in physical fighting (Basch, 2011; Kearney, 2008), gang-related violence (Jarillo, Magaloni, Franco, & Robles, 2016), being a victim of bullying (Grinshteyn & Yang, 2017; Seelman & Walker, 2018), lack of school connectedness (Frehill & Dunsmuir, 2015), poor school climate, uninteresting classes, and poor student-teacher relationship (Kearney & Graczyk, 2014), and mental health problems such as depression and anxiety (Amouroux et al., 2017; Gonzálvez et al., 2018), substance use (Burton, Marshal, & Chisolm, 2014; Eaton, Brener, & Kann, 2008; Kearney, 2008), and suicide-related behaviors (Seelman & Walker, 2018). Lack of parental monitoring and parent-child interactions have also been found to be associated with school absenteeism (Cook, Dodge, Gifford, & Schulting, 2017).

Household food insecurity has been recognized as a growing social, economic, and public health problem in Ghana (Agbadi, Urke, & Mittelmark, 2017; Atuoye, Kuuire, Kangmennaang, Antabe, & Luginaah, 2017). Although important, household food insecurity has received little research attention as a predictor of school absenteeism, particularly within the Ghanaian context. The Food and Agriculture Organization (FAO) states that food security exists "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (Declaration, 1996, p. 4). Access to food is a major challenge in Ghana, especially in the three Northern Regions, which are the poorest regions in the country and experience severe adverse climate conditions (UNDP Report, 2010). According to the World Food Programme Report (2017), about a third of children of school going age in Ghana experience moderate to severe hunger. Recognizing the problem of household food insecurity in the country, the Government of Ghana in 2013 developed the National Nutrition Policy (NNP) with the ultimate goal of ensuring optimal nutrition and good health for all Ghanaians (Ghana National Nutrition Policy, 2013). This was after implementing the Ghana School Feeding Program (GSFP) in 2005 with the goal of ending hunger among schoolchildren so as to achieve universal primary education (Government of Ghana, n.d.).

Some cross-sectional (Huang, Potochnick, & Heflin, 2018; Payne-Sturges, Tjaden, Caldeira, Vincent, & Arria, 2018; Shanafelt, Hearst, Wang, & Nanney, 2016) and longitudinal (Hernandez & Jacknowitz, 2009; Howard, 2011) studies from high income countries have shown the long-term negative impact of household food insecurity on school absenteeism. A recent systematic review also found support for the association between household food insecurity and school absenteeism (Shankar, Chung, & Frank, 2017). However, this association has not been adequately investigated in low-middle income countries (LMICs) such as Ghana. Thus, drawing on a large nationally representative sample, this study examined the effects of household food insecurity on school absenteeism among JHS students in Ghana. The research question informing this study is whether students from food insecure households have a greater likelihood of missing school relative to their counterparts from food secure households? We hypothesized that the likelihood of a student missing school will be significantly

greater for those from food insecure households than those from food secure households, net of the effects of demographic, school environment, and psychosocial factors that the extant literature has found to be associated with school absenteeism.

2. Data and methods

2.1. Participants

Data for this study were derived from the 2012 Ghana Global School-Based Health Survey (GSHS). The 2012 Ghana GSHS was a school-based survey conducted among Junior high school (JHS) students to understand health behaviors and protective factors related to mortality and morbidity among adolescents in Ghana (Owusu, 2012). The survey was conducted in collaboration with the Joint United Nations Programme on HIV and AIDS (UNAIDS), United Nations Educational, Scientific, and Cultural Organization (UNESCO), United Nations International Children's Emergency Fund (UNICEF), World Health Organization (WHO), Middle Tennessee State University, and Ghana Education Service (GES) with technical assistance from the Centers for Disease Control and Prevention (CDC) (Owusu, 2012). Details of the 2012 Ghana GSHS including the objectives and methodology could be obtained from the Ghana GSHS Country Report (Owusu, 2012) and have been provided in other publications (references removed for review purposes). In brief, the objectives of the 2012 GSHS among others were to provide reliable data on health behaviors in order to: (1) help Ghana prioritize and allocate resources for school health and adolescent health programs and policies; (2) establish trends in the prevalence of health behaviors and protective factors for use in evaluation of school health and adolescent health promotion; and (3) allow for cross cultural comparisons of student health outcomes between Ghana and other international agencies (Owusu, 2012).

The 2012 Ghana GSHS covered academic outcomes, mental health, violence and unintentional injury, physical activity, alcohol and substance use, sexual behaviors that contributes to HIV infection, other STIs, unintended pregnancy, as well as protective factors. The Ghana GSHS employed a two-stage cluster sampling design to obtain a representative sample of students in JHS. First, the country was divided into three geographic zones (Southern, Central, and Northern) with 25 schools per zone sampled with probability proportional to school enrolment size. The second stage of the sampling consisted of randomly selecting intact classrooms from each participating school. All classrooms in each selected school were included in the sampling frame (Owusu, 2012). Every student in the sampled classrooms was eligible to participate in the GSHS. Written permission for data collection was sought and obtained from GES and the participating schools. Informed consent was obtained from the students and participation in the survey was voluntary and anonymous. Further details about the 2012 Ghana GSHS, could be obtained from the Ghana GSHS Country Report (Owusu, 2012). The study protocol for conducting the 2012 Ghana GSHS was approved WHO, CDC, and GES Institutional Review Board (IRB) and the publicly available data have been de-identified, hence, no additional IRB approval was required.

The 2012 Ghana GSHS had a school response rate of 97% and a student response rate of 84%. The sample used in this study consisted of 1,121 JHS students. Due to the complex sampling design, a numeral weight was assigned to each student so as to enable generalization of study results to the student population of Ghana. All analyses are based on the weighted data.

2.2. Variables

2.2.1. Dependent variable

The dependent variable in this study was school absenteeism and was measured as a binary variable. Students were asked "During the past 30 days, on how many days did you miss classes or school

without permission?" with the following response options "0 = 0 days", "1 = 1 or 2 days", "2 = 3 to 5 days", "3 = 6 to 9 days", and "4 = 10 or more days". Given the low distribution of responses in the upper category and following the recommendation of the 2012 Ghana GSHS (Owusu, 2012), students who were coded 1 through 4 were considered to have missed school at least once without permission during the past 30 days and were recoded as 1; whereas students who were coded as 0 were considered not to have missed school during the past 30 days.

2.2.2. Independent variable

The independent variable in this study was household food insecurity and was measured based on the question, "During the past 30 days, how often did you go hungry because there was not enough food in your home?" with the following response options "0 = never", "1 = rarely", "2 = sometimes", "3 = most of the time", or "4 = always". Students who indicated "sometimes", "most of the time" or "always" were considered to be food insecure and were recoded as 1 and those who indicated "never" or "rarely", were considered to be food secure and were recoded as 0. Similar categorization has been used by other researchers (Asante et al., 2017; Pengpid & Peltzer, 2017).

2.2.3. Control variables

The following variables were also included in the analysis as control variables. Age was measured in years and sex was coded as "0 = male" and "1 = female. Grade level was measured as "0 = JHS1", "1 = JHS2", and "2 = JHS3". School bullying was measured based on the question "During the past 30 days, on how many days were you bullied?" Students who were bullied on one or more days were recoded as 1 and compared to those who were not bullied who were coded as 0. School fighting was measured based on the question "During the past 12 months, how many times were you in a physical fight?" Students who indicated that they fought on one or more occasions were coded as 1 and compared to those who did not fight who were coded as 0. Loneliness was measured based on the question "During the past 12 months, how often have you felt lonely?" with the following response options "0 = never", "1 = rarely", "2 = sometimes", "3 = most of the time", and "4 = always". Students who indicated "most of the time" or "always" were recoded as 1 and those who indicated "never", "rarely", or "sometimes" were recoded as 0.

Suicidal ideation was measured based on the question "During the past 12 months, did you ever seriously consider attempting suicide?" Students who answered in the affirmative were considered to have experienced suicidal ideation and were coded as 1; whereas those who answered in the negative were coded as 0. In addition, the following substance use variables were examined and measured as binary variables (0 = no versus 1 = yes) based on the corresponding questions: alcohol use, "During the past 30 days, on how many days did you have at least one drink containing alcohol?"; smoking, "During the past 30 days, on how many days did you smoke cigarettes?"; and illicit substance use, "During the past 30 days, on how many days did you use any tobacco products other than cigarettes, such as tawa snuff powder, chewing tobacco, paper rolled tobacco, dip, cigars, or pipe?". We also controlled for school mates' who were kind and helpful and parental support. School mates' who were kind and helpful was measured based on the question "During the past 30 days, how often were most of the students in your school kind and helpful?" with the following response options "0 = never", "1 = rarely", "2 = sometimes", "3 = most of the time", and "4 = always". Students who indicated "sometimes", "most of the time" or "always" were recoded as 1 and those who indicated "never" or "rarely" were recoded as 0.

Lastly, parental support measured the level of support the child received from his or her parents and was measured as an interval/ratio variable based on 3 questions: 1) During the past 30 days, how often did your parents or guardians check to see if your homework was done?; 2) During the past 30 days, how often did your parents or guardians understand your problems and worries?; and 3) During the past 30 days, how often did your parents or guardians really know what you were doing with your free time? Each item was coded on a five-point Likert scale ranging from 1 (never) to 5 (always). Scores on the parental support scale ranged from 1 to 15

with higher scores indicating greater parental support. Internal consistency of the parental support scale examined in this study yielded a Cronbach's alpha value of .66, suggesting a moderate correlation among the three items.

2.3. Data analyses

Data were analyzed using descriptive, bivariate, and multivariate statistics. First, the distribution of all the variables was examined. Next, Pearson chi-square was used to test the association between school absenteeism and the independent and control variables. Multicollinearity among household food insecurity and the control variables was assessed and found not to be a problem. The multivariate analysis involves the use of binary logistic regression to examine the independent effect of household food insecurity on school absenteeism while simultaneously adjusting for the effects of other predictors. We opted for logistic regression given that the outcome variable (school absenteeism) was measured as a binary variable and the explanatory variables were measured as categorical and interval/ratio variables. Two logistic regression models were fitted. In Model 1, we regressed school absenteeism on demographic, school environment, and psychosocial factors. Model 2 consisted of variables in Model 1 plus household food insecurity to ascertain the effect of household food insecurity on school absenteeism over and above variables in Model 1. Model fitness was assessed using the Hosmer-Lemeshow goodness-of-fit (G.O.F.) test statistic whereby a non-significant chi-square test statistic indicates good fit (Hosmer & Lemeshow, 2000). The omnibus Wald chi-square test of model coefficients, which follows a chi-square distribution, was also used to evaluate the statistical significance of the logistic regression model. The proportion of variance in school absenteeism that could be explained by the predictors was assessed based on the Pseudo R square. Adjusted odds ratios (AOR) were reported together with their corresponding 95% Confidence Intervals (CI). Variables were considered significant if the *p*-value was less than .05. All analyses were performed using STATA version 14 (Stata Corp., College Station, Texas, USA).

3. Results

3.1. Sample characteristics

Table 1 shows the general distribution of the study variables. Of the 1,121 students examined, 446 representing 39.8% missed school without permission during the past 30 days. More than half (58.1%) were from food insecure households. The average age of the students was 14.6 (*SD* = 1.8, range = 11–18) and the average parental support score was 8.9 (*SD* = 3.5, range = 3–15). Majority of the students (53.3%) were males. A little over a third of the students (36.1%) were in JHS1, 35% were in JHS2, and 29.9% were in JHS3. More than half (58.4%) of the students were bullied during the past 30 days and 47.5% had fought someone at school during the past 12 months. About 18% of the students experienced suicidal ideation during the past 12 months and 12.4% reported feeling lonely during the past 12 months. The distribution of the three substance use variables is as follows: alcohol use (15%), illicit substance use (11.8%), and smoking (7.8%). Majority of the students (70.3%) had school mates who were kind and helpful to them during the past 30 days.

3.2. Bivariate results

The bivariate results between school absenteeism, the explanatory and control variables are presented in Tables 2 and 3. There was no significant association between age and school absenteeism. However, there was a significant bivariate association between parental support and absenteeism whereby the average parental support among students who were absent from

school was lower than the average parental support among students who were not absent from school ($M_{\text{not absent}}$ = 9.14 vs. M_{absent} = 8.66, $F(1, 1119) = 5.12$, $p < .05$).

The proportion of students from food insecure households that were absent from school (45%) was significantly greater than the proportion of students from food secure households that were absent (32.5%; $\chi^2(1) = 17.74$, $p = .0011$). There was a marginal association between gender and school absenteeism whereby 42.6% of females compared to 37.3% of males were absent from school ($\chi^2(1) = 3.29$, $p = .056$). More than 40% of students who were bullied or engaged in school fighting were

Table 1. Sample distribution (N = 1,121).

Variables	N (%)
Outcome variable	
Absenteeism	
No	675 (60.2)
Yes	446 (39.8)
Main predictor variable	
Food insecurity	
Food secure	470 (41.9)
Food insecure	651 (58.1)
Control variables	
Age in years, Mean (SD, range)	14.6 (1.8, 11–18)
Parental support, Mean (SD, range)	8.9 (3.5, 3–15)
Gender	
Male	598 (53.3)
Female	523 (46.7)
Grade level	
JHS1	405 (36.1)
JHS2	392 (35.0)
JHS3	324 (29.9)
School mate kind and helpful	
No	333 (29.7)
Yes	788 (70.3)
Victim of bullying	
No	466 (41.6)
Yes	655 (58.4)
School fighting	
No	588 (52.5)
Yes	533 (47.5)
Loneliness	
No	982 (87.6)
Yes	139 (12.4)
Suicidal ideation	
No	924 (82.4)
Yes	197 (17.6)
Cigarette use	
No	1,033 (92.2)
Yes	88 (7.8)
Alcohol use	
No	953 (85.0)
Yes	168 (15.0)
Illicit substance use	
No	988 (88.2)
Yes	133 (11.8)

Table 2. ANOVA result examining the relationship between school absenteeism and age and parental support (N = 1,121).

	Truancy			
Variable	No (*SD*)	Yes (*SD*)	*F-value* (*df*)	Sig.
Age	14.58 (1.75)	14.60 (1.75)	0.04 (1, 1119)	.8445
Parental support	9.14 (3.65)	8.66 (3.24)	5.12 (1, 1119)	.0239

Table 3. Bivariate association between school absenteeism and sample characteristics (N = 1,121).

	Absenteeism		
Variables	No	Yes	χ^2 value
Food insecurity			17.74 (p = .0011)
Food secure	67.5	32.5	
Food insecure	55.0	45.0	
Gender			3.29 (p = .056)
Male	62.7	37.3	
Female	57.4	42.6	
Grade level			0.35 (p = .9172)
JHS1	60.6	39.4	
JHS2	59.1	40.1	
JHS3	61.1	38.8	
School mate kind and helpful			0.92 (p = .4704)
No	62.4	37.6	
Yes	59.3	40.7	
Victim of bullying			24.52 (p < .001)
No	68.8	31.2	
Yes	54.1	45.9	
School fighting			34.79 (p < .001)
No	68.4	31.6	
Yes	51.1	48.9	
Loneliness			16.06 (p = .0026)
No	62.4	37.6	
Yes	44.6	55.4	
Suicidal ideation			21.90 (p = .0044)
No	63.4	36.6	
Yes	45.4	54.6	
Cigarette use			43.33 (p = .0003)
No	63.0	37	
Yes	27.2	72.8	
Alcohol use			41.29 (p < .0001)
No	64.2	35.8	
Yes	37.8	62.2	
Illicit substance use			48.57 (p < .0001)
No	63.9	36.1	
Yes	32.4	67.6	

absent from school. Also, more than half of the students who experienced suicidal ideation, felt lonely, used alcohol, smoked cigarettes or used illicit substances were absent from school.

3.3. Multivariate results

Model fitness indices indicated that the multivariate logistic regression models were fit and the predictors included made significant contributions to the model. Based on the Pseudo R square, variables included in Model 1 explained 7.46% of the variance in absenteeism. Adding food insecurity to Model 2 resulted in a slight improvement in the explained variance to 8.19%. The Hosmer-Lemeshow G.O.F. test statistic was also non-significant in both models.

The results of the multivariate logistic regression analysis examining the effects of household food insecurity on school absenteeism while controlling for the effect of other predictors are presented in Table 4. Age and grade level were both not associated with school absenteeism. There was a marginal association between gender and school absenteeism in both Models 1 and 2. Controlling for other predictors in Model 2, females had 1.26 times higher odds of being absent from school when compared to their male counterparts (AOR = 1.26, p= .080, 95% CI = 0.97–1.63). The odds of school absenteeism were 1.34 times higher for students who were bullied (AOR = 1.34, p < .05, 95% CI = 1.02–1.77), 1.57 times higher for students who fought in school (AOR = 1.57, p < .001, 95% CI = 1.20–2.06), 1.53 times higher for students who felt lonely

Table 4. Multivariate logistic regression results predicting school absenteeism (N = 1,121).

	Model 1			Model 2		
Variables	AOR	p-value	95% C.I.	AOR	p-value	95% C.I.
Age in years	1.02	.679	0.94–1.10	1.01	.819	0.93–1.10
Gender (ref: Male)						
Female	1.28	.057	0.99–1.66	1.26	.080	0.97–1.63
Grade level (ref: JHS1)						
JHS2	1.10	.557	0.80–1.50	1.05	.739	0.77–1.44
JHS3	0.95	.800	0.67–1.36	0.89	.543	0.62–1.28
School mate kind and helpful (ref: No)						
Yes	1.24	.150	0.92–1.67	1.23	.169	0.92–1.65
Victim of bullying (ref: No)						
Yes	1.36	.029	1.03–1.78	1.34	.036	1.02–1.77
School fighting (ref: No)						
Yes	1.60	.001	1.22–2.09	1.57	.001	1.20–2.06
Loneliness (ref: No)						
Yes	1.51	.046	1.01–2.26	1.53	.041	1.02–2.30
Suicidal ideation (ref: No)						
Yes	1.54	.012	1.10–2.16	1.52	.016	1.08–2.14
Cigarette use (ref: No)						
Yes	1.41	.309	0.73–2.73	1.49	.237	0.77–2.87
Alcohol use (ref: No)						
Yes	1.67	.013	1.11–2.50	1.61	.019	1.08–2.41
Illicit substance use (ref: No)						
Yes	1.93	.010	1.17–3.18	1.88	.014	1.13–3.11
Parental support score	0.96	.030	0.92–0.99	0.96	.041	0.92–0.99
Food insecurity (ref: Food secure)						
Food insecure				1.56	.001	1.20–2.02
Pseudo R square	.0746			.0819		
Wald chi-square	95.70 (.0001)			105.91 (.0001)		
Hosmer-Lemeshow (Sig)	1020.26 (.2746)			1069.16 (.3101)		

(AOR = 1.53, p < .05, 95% CI = 1.02–2.30), 1.52 higher for students who experienced suicidal ideation (AOR = 1.52, p < .05, 95% CI = 1.08–2.14), 1.61 times higher for students who used alcohol (AOR = 1.61, p < .05, 95% CI = 1.08–2.41), and 1.88 times higher for students who used illicit substances (AOR = 1.88,p < .05, 95% CI = 1.13–3.11). Parental support had a protective effect on school absenteeism such that, for each additional increase in parental support score, the odds of school absenteeism were predicted to decrease by 4%, net of the effect of other predictors (AOR = 0.96, p < .05, 95% C.I = 0.92–0.99). Controlling for other predictors, students from food insecure households had 1.56 times higher odds of missing school without permission when compared to their counterparts from food secure households (AOR = 1.56, 95% C.I = 1.20–2.02).

4. Discussion

The objective of this study was to examine the effects of household food insecurity on school absenteeism among JHS students in Ghana. The results indicated that more than half of the students were from food insecure households and 39.8% of the students missed school without permission during the past 30 days. The finding that 58.1% of students were from food insecure households is comparable to findings by scholars from other LIMCs (Dewing, Tomlinson, le Roux, Chopra, & Tsai, 2013; Jones, 2017). Our results show that students from food insecure households have a significantly higher likelihood of school absenteeism than students from food secure households. A significant effect of household food insecurity on school absenteeism was obtained from the multivariate logistic regression that adjusted for bullying at school, alcohol and drug use, loneliness, suicidal ideation, and parental support. This finding corroborates an earlier study from Southwest Ethiopia by Belachew et al. (2011) who followed 2009 adolescent students aged 13–17 years for two years and found that compared to adolescent students from food secure

households at baseline, adolescent students from food insecure households were more likely to be absent from school at follow-up. This was after adjusting for baseline characteristics such as age, gender, place of residence, gender of the household head, and physical and mental health problems (Belachew et al., 2011). In addition, Bernal, Frongillo, Herrera, and Rivera (2014) found that children who reported experiencing food insecurity had a higher prevalence of school absenteeism in the Miranda State of Venezuela. The consistency of our results with past studies, underscores the need for Food for Education programs (e.g., school assistance programs) that could promote school attendance, student retention, and graduation.

Providing food assistance to families in order to encourage student enrollment or directly to students in schools is known to have significant educational and cognitive benefits (Hernandez & Jacknowitz, 2009). With regard to education, feeding students with meals or snacks at school for breakfast and/or lunch has alleviated short-term hunger and increased school attendance, academic performance, and on-task behavior in classrooms (Acham, Kikafunda, Malde, Oldewage-Theron, & Egal, 2012; Adolphus, Lawton, & Dye, 2013; Cheung & Berlin, 2015; Omwami, Neumann, & Bwibo, 2011). Cognitively, students from food secured households have been found to have increased concentration span and learning capacity (Jomaa, McDonnell, & Probart, 2011). Additionally, the provision of food in schools has been found to reduce female dropout rate (Gelli, Meir, & Espejo, 2007). The effect is more visible in socioeconomically marginalized communities and food desserts (Bernal et al., 2014; Omwami et al., 2011). In Ghana, the implementation of the GSFP has shown to have contributed significantly to school enrollment, attendance, and retention, especially in rural areas (Bukari, Hajara, & Oloruntoba, 2015; Yendaw & Dayour, 2015). In order to meet the Sustainable Development Goal 4.1 – 'achieving universal primary and secondary education', it is imperative that Food for Education (FFE) programs are evaluated and improved upon to ensure all pupils and students in spite of their geographical location and socio-economic background have the ability to learn and be productive in food sufficient communities.

We also found that school absenteeism could occur due to other reasons aside household food insecurity. First, bullying and school fighting were found to be significant predictors of school absenteeism. Previous studies have found an association between bullying and school absenteeism (Dake, Price, & Telljohann, 2003; Ingul, Klockner, Silverman, & Nordahl, 2012). Gastic's (2008) study on school truancy and disciplinary problems of bullying victims in the United States, showed that bullying was positively associated with increased risk for frequent absenteeism and being subjected to formal school actions, such as in-or out-of-school suspensions for high school bullying victims. The results of our study do confirm a similar association between bullying, school fighting and school absenteeism in Ghana. Building a supportive school climate that encourages students to seek help for bullying and threats of violence could help those who have been victimized.

Second, we found the use of alcohol, cigarette and illicit substances to increase the odds of school absenteeism. While the effects of drug use have been examined by other researchers, there is little evidence on its impact on school absenteeism (Kearney, 2008). To the best of our knowledge, this study is one of the first to show a significant positive association between students' use of alcohol, cigarette or illicit substances, and school absenteeism in Ghana. Further studies are needed to examine the mechanism through which these effects occur. Third, our study demonstrates the association between students' experience of loneliness, suicidal ideation, and school absenteeism and this suggests the existence of a psychiatric pathway to school absenteeism. While this finding is not new to studies conducted in developed countries, it unearths a novel field for scholars in developing countries to explore the means by which mental health experiences such as loneliness, suicidal ideation, anxiety, and mood disorders could lead to school absenteeism and poor academic performance.

Another important finding of this study is the role parental support plays in reducing school absenteeism. Students whose parents or guardians were involved in their academic life by helping with homework, alleviating their worries and anxieties, and providing oversight over their everyday activities were less likely to be absent from school. Such support has also been found to help

students not only to adjust to school demands, manage anxieties, and mediate alcohol and substance use, but also improve academic performance and mental health (Desforges & Abouchaar, 2003; Prakash et al., 2017).

4.1. Study limitations

There are some limitations associated with this study that are worth noting. First, the use of secondary data limits our ability to examine other theoretically relevant predictors that are known to influence absenteeism such as childhood physical, emotional and sexual abuse, exposure to domestic violence, as well as parental history of substance use, incarceration, and mental health problems. Future studies should examine the effect of these factors, as well as family, neighborhood, and community factors that might influence absenteeism among JHS students. In addition, given that the Northern Regions in Ghana are the poorest regions of the country and educational resources are not equally distributed across these regions (UNDP Report, 2010), it would have been useful to control for geographical region in the analysis. However, the 2012 GSHS does not have geographical region as a variable in the public dataset. Future studies could consider controlling for the effects of geographical location to determine the magnitude of the effect food insecurity contribute in explaining absenteeism among students.

Second, due to the cross-sectional nature of the study, we were not able to determine the temporal order between the independent and control variables and the dependent variable, and therefore only associations can be inferred. A longitudinal study that examines changes in household food insecurity and school absenteeism over the course of JHS education would provide a more nuanced understanding between the study variables and school absenteeism. Third, the measure of household food insecurity was based on a single question, which does not take into account several dimensions of household food insecurity, such as food availability, accessibility, and safety; hence, we recommend that the results be interpreted and applied with some caution. In addition, several of the measures were self-reported, and are therefore subject to reporting biases. Subsequent studies may benefit from measuring household food insecurity from multiple sources. Fourth, due to the nature of the distribution of absenteeism, we were unable to examine the impact of food insecurity on chronic absenteeism (i.e., students who were absent from school 10 or more times during the past 30 days without permission). This is an important area of research for future consideration. Lastly, our focus on students in JHS limits the extent to which inferences could be made to children in elementary schools (grades 1–6). Nonetheless, this is a function of available information in the Ghana Global School-Based Health Survey. Future studies could focus on both primary and JHS students in order to have a deeper understanding of the effect of household food insecurity in light of promoting primary and junior secondary education.

4.2. Conclusions

Regular school attendance is a prerequisite for building student success and high academic performance, nurturing social competence and relationships, acquiring critical and problem-solving skills, and developing a pathway for success in life. However, school absenteeism could lead to poor academic performance and limited social engagement, increase school dropout, and create detrimental social and economic long-term consequences for students. This paper has shown that one of the many ways by which this can be mitigated is to ensure food security at the household level. This has significant implications for programs and policies aimed at ensuring that both girls and boys complete free, equitable, and quality basic and intermediate education leading to relevant and effective learning outcomes (SDG 4.1). The introduction of programs, such as the GSFP, is a step in the right direction. Addressing both distal and structural drivers of food insecurity is critical in reducing school absenteeism and alleviating the financial burden on the government.

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Disclosure statement

No potential conflict of interest was reported by the author.

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