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Relationship between mothers'/caregivers' reported learning difficulty and internalizing symptoms (anxiety and depression) of children aged 5–17 years in Ghana

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ABSTRACT

Background: Children with learning difficulties are vulnerable to internalizing symptoms, particularly anxiety and depression. However, only few studies have examined this relationship in low-and-middle-income countries using a nationally representative data.
Aims: This study aimed to examine the relationship between learning difficulty and internalizing symptoms of children aged 5−17 years in Ghana while controlling for covariates.
Methods and procedures: We analyzed children's data using mothers'/caregivers' reports from the 2017/2018 Ghana Multiple Indicator Cluster Survey Six (MICS 6). Data of 8,958 children aged 5−17 years were used for the analysis.
Outcomes and results: About 20% of the children had some learning difficulties whereas 5% could not learn at all. Learning difficulty was associated with symptoms of anxiety and depression of children. Specifically, children who had some learning difficulties had higher odds of feeling anxious [APOR = 1.28, 95% CI:1.11, 1.49, $p = 0.001$] while those with some difficulties [APOR=1.24, 95% CI:1.07, 1.44, $p = 0.004$] and a lot of difficulties or could not learn at all [APOR=1.74, 95% CI:1.28, 2.37, $p < 0.01$] had higher odds of feeling depressed.
Conclusion and implications: The findings call on stakeholders in education and health to prioritize the mental health of all school-going children, particularly those with learning difficulties in Ghana.

What does this paper add?

Studies have reported different factors associated with anxiety and depression among children and adolescents. However, studies examining the relationship between learning difficulties and internalizing symptoms of Ghanaian children is scarce. The only study available found that 152 students with learning difficulties who visited a psychology clinic for psychological assessment had high levels of stress and anxiety (Asare & Danquah, 2016). While the study provided preliminary evidence of the relationship between learning difficulties and internalizing symptoms, it had some methodological challenges. For instance, the study used a relatively smaller sample size and subsampled children in Accra. Our study used a nationally representative dataset of children aged 5−17 years

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to investigate the relationship between learning difficulties and internalizing symptoms; specifically, anxiety and depression. This paper adds to the literature that children who had some learning difficulties were more likely to feel anxious than children without learning difficulties. Children with 'some difficulties' and 'a lot of difficulties or could not learn at all' were more likely to feel depressed. In other words, learning difficulty was significantly related to both anxiety and depression of children aged 5−17 years in Ghana. Therefore, any policies, programs or interventions set up to promote the education of children in Ghana must take into consideration the difficulties that some children may have in learning.

1. Introduction

Learning difficulty is a condition that makes it difficult for absorption, retention, and recall of a learned material (Lerner, 2000). More specifically, children with learning difficulties are those with difficulties in learning including persistent difficulties in reading, writing, arithmetic, or mathematical reasoning skills (Fletcher, Lyon, Fuchs, & Barnes, 2018). In this case, children have challenges in encoding what they are required to learn; they are not able to store what has been learnt in memory; or they have difficulties when they have to retrieve what has been stored. In clinically diagnosing children with learning difficulty, the child's current academic skills must be below average in linguistically and culturally appropriate tests of reading, writing, and mathematics (American Psychiatric Association, 2013). There are various learning disabilities which include dyslexia, dysgraphia, dyscalculia, auditory processing disorder, language processing disorder, nonverbal learning disabilities, and visual perceptual/visual motor deficit (American Psychiatric Association, 2013). Children with these learning difficulties are at an increased risk of having poor academic performance (Attah & Mate-Kole, 2014).

Learning difficulty is considered as a global problem that requires special attention. Globally, millions of children below 18 years have difficulties with learning, with about 2% of school-going children between the ages of 6 and 14 having this problem (UNICEF, 2014). It is estimated that about 80% of these children reside in low-and-middle-income countries (Opoku, 2017). In Ghana, statistics shows that children with learning difficulties are hard to reach making it difficult to establish the prevalence of learning difficulties among children. As of 2010, about 24.9% of persons with disabilities (PWD) which constitute children aged 1–18 years were living with some form of disability, including those with learning disabilities in Ghana (Ghana Statistical Service, 2013; 2014). From four (4) Ghanaian schools, Attah (2010) reported that 70% of the children had one or more learning disabilities in reading, spelling, or mathematics. Given this prevalence, it is important to pay particular attention to children who have such difficulties with learning as they are the nation's future human resource. It is also a cause for concern as the existing education systems are not adequately equipped for children with learning difficulties (Karr, Hayes, & Hayford, 2020).

Due to inadequate resources to aid children with learning difficulties in Ghana, some negative labels have been assigned to these children, which include 'slack, dumb, and stupid' by teachers and peers (Opoku, 2017). In some situations, the conditions of these children are seen as a cause of spiritual forces, therefore denying people to provide the necessary support for children with learning difficulties (Avoke, 2002; Kahissay, Fenta, & Boon, 2017). Children with difficulties in learning also experience stigma, discrimination and abuse (Okyere, Aldersey, & Lysaght, 2019). As a consequence, some of these children end up dropping out of school and find themselves on the streets (Mensah, 2015). Major policies such as the Disability Act (Act 715) of Ghana have not made adequate provisions for children with learning difficulties. Children with learning difficulties in Ghana are, therefore, not included in the special programs which allocate resources to persons with disabilities. Thus, learning difficulty is not recognized as a problem in Ghana and children experiencing this difficulty do not often get the needed support and attention. The lack of interventions may contribute to the development of mental health symptoms in children with learning difficulties (Mammarella et al., 2016).

According to Ghandour et al. (2019), approximately 4.4 million and 1.9 million children (3−17 years) have been diagnosed with anxiety and depression respectively. Studies have reported association between learning difficulties, and anxiety and depression (see e.g. Asare & Danquah, 2016; Carroll, Maughan, Goodman, & Meltzer, 2005; Grills-Taquechel, Fletcher, Vaughn, & Stuebing, 2012). Carroll et al. (2005) found that literacy difficulties are prevalent among children with lower socio-economic backgrounds and it increases the risk of Attention Deficit and Hyperactivity Disorder (ADHD), conduct disorder, anxiety disorders in girls and boys and depressed mood in boys. Bitew et al. (2020) also reported that perceived learning difficulties predicted the intensification of symptoms associated with depression. Similarly, Grills-Taquechel et al. (2012) found that children with literacy problems experience socio-emotional problems such as depression and deficits in social skills. In addition, Klassen, Tze, and Hannok (2013) found that students who had difficulties with reading and writing developed internalizing problems during their early school years and externalizing problems as they got older. Thus, children with significant learning difficulties are more likely to become anxious or depressed. Nonetheless, there is also the likelihood that increased anxiety could impact students' ability to learn. In this case, children would experience interference with their concentration, memory and information processing, which can result in lower academic achievements (Grills-Taquechel et al., 2012).

Research on internalizing symptoms among children in Ghana is gradually increasing. Studies have reported different factors associated with anxiety and depression among children and adolescents (Addy, Agbozo, Runge-Ranzinger, & Grys, 2021; Arhin, Asante, Kugbey, & Oti-Boadi, 2019; Kusi-Mensah, Donnir, Wemakor, Owusu-Antwi, & Omigbodun, 2019). However, studies examining the relationship between learning difficulties and internalizing symptoms of Ghanian children is scarce. The only study available found that 152 students with learning difficulties who visited a psychology clinic for psychological assessment had high levels of stress and anxiety (Asare & Danquah, 2016). While the study provided preliminary evidence of the relationship between learning difficulties and internalizing symptoms, it had some methodological challenges. For instance, the study used a relatively smaller sample size and subsampled children in Accra. Our study extends that of Asare and Danquah (2016) by using a nationally representative dataset of children aged 5−17 years to investigate the relationship between learning difficulties and internalizing symptoms; specifically, anxiety

and depression. The findings of this study will provide important information for stakeholders to optimize interventions aimed at improving learning conditions and the mental health of Ghanaian children.

1.1. Theoretical framework

This study relied on the learned helplessness theory (Seligman & Maier, 1967) to explain the relationship between learning difficulties and internalizing problems. Learned helplessness is when an individual has been subjected to an uncontrollable stress repeatedly which leads to the belief that they are unable to control their situation (Sorrenti et al., 2019). These individuals become passive and thus fail to change their situations even when there are a lot of opportunities to do so. Learned helplessness has been linked to increased feelings of stress, depression, and post-traumatic stress disorder (PTSD) (Fassett-Carman, Hankin, & Snyder, 2019). Based on the classical experiment that developed the theory, Seligman and Maier (1967) discovered that the dogs that could not control the shocks given to them eventually showed signs of depression and anxiety. Relatedly, children with learning difficulties who repeatedly fail to achieve certain academic feats unlike their colleagues may give up every effort to learn. This could result in feelings of worthlessness and make them anxious whenever they are called to read or write. Consequently, children with learning difficulties may perceive themselves as unable to change their situation or even cope with it. These children may develop a sense of learned helplessness because of the ridicule and abuse that they receive as a result of their difficulties to learn.

2. Methods

2.1. Study design

The data of children collected from (biological) mothers or caregivers by 2017/2018 Ghana Multiple Indicator Cluster Survey Six (GMICS 6) (GSS, 2018) was used for this study. This survey was cross-sectionally conducted by the Ghana Statistical Service (GSS) together with the Ghana Health Service (GHS), Ministry of Health (MOH), and the Ministry of Education with funding and technical support from United Nations Children's Fund (UNICEF) and other international donors (Ghana Statistical Service, 2018). The purpose of the MICS surveys, which began in the 1990s, was to collect data on key indicators that assist countries to generate information for use in national development plans, policies, and programmes, as well as to measure progress towards the SDGs and other internationally signed agreements (Ghana Statistical Service, 2018).

2.2. Study setting

Ghana is an English-speaking country in West Africa and classified as a lower-middle-income country with a projected population of 30,955,204 (Ghana Statistical Service, 2020). About 2.2 million Ghanaians are considered extremely poor, living on less than $1.9 a day (The World Bank, 2015). The population projection of children aged 5–19 years in Ghana is 10,866,193 (Ghana Statistical Service, 2020). The 2010 population and housing census reported that children below 19 years living with disability make up 183,544 of the population (Ghana Statistical Service, 2013). The types of disabilities in this report are sight, hearing, speech, physical, intellectual, emotional and other disabilities. However, learning disabilities are not specifically reported on. Ghana's national educational system has experienced some changes over the years (Aheto-Tsegah, 2011). Currently, the number of years for pre-tertiary education is 14 years. Children aged 5–17 years fall within this level of education. The basic education level which spans 11 years comprises 2 years of early childhood education, 6 years of primary, and 3 years of junior high school. Children also go through 3 years of second-cycle education (Aheto-Tsegah, 2011). In addition to the mainstream educational system, there is special and inclusive education that cater for the special needs of children who, as a result of some disability, may need specialised care and education (Ametepee & Anastasiou, 2015).

2.3. Data collection procedure and sample size

A multi-stage, stratified cluster sampling approach was used to survey a nationally representative sample of children and women in urban and rural areas (sampling strata) located in the previously 10 administrative regions in Ghana: Western, Central, Greater Accra, Volta, Eastern, Ashanti, Brong Ahafo, Northern, Upper East and Upper West (Ghana Statistical Service, 2018). The 2010 Population and Housing Census (PHC) of Ghana formed the basis for the sampling frame. Within each stratum, enumeration areas (EAs) based on the PHC frame were identified and selected using systematic probability proportional to size (PPS) sampling procedures. The EAs became the primary sampling units (PSUs), and this selection completed the first stage of sampling. Next, households were listed in each EA and a sample of households was selected in the second stage, using systematic random sampling. The survey recruited participants from 13,202 households. Data on 8,958 children aged 5−17 years was analysed in this study. Sample weights increased this figure to a nationally representative data of 21,856.

2.4. Study tool and measures

The services of trained enumeration officials were employed to conduct the survey. These officials were dispatched onto the field to collect the data with six different enumerating instruments including the "Questionnaire for children aged 5−17 years". Mothers or primary caregivers serving as proxy respondents were asked multiple questions about their children including the presence of learning

Table 1
Summary of weighted sample characteristics.

Study Variables	Frequency	Percentage
Dependent variable		
Anxiety		
(0) Never	10,571	48.34
(1) A few times a year	7,935	36.29
(2) Monthly	1,667	7.63
(3) Weekly	768	3.51
(4) Daily	925	4.23
Depression		
(0) Never	10,516	48.09
(1) A few times a year	8,508	38.91
(2) Monthly	1,564	7.15
(3) Weekly	640	2.93
(4) Daily	640	2.92
Independent variables		
Learning difficulty		
(0) No difficulty	16,340	74.75
(1) Some difficulty	4,360	19.94
(2) A Lot of difficulty/cannot at all	1,161	5.31
Control variables		
Child's age		
(0) 5–9 years	9,576	43.78
(1) 10–14 years	8,451	38.64
(2) 15–17 years	3,844	17.58
Child gender		
(0) Boys	11,214	51.27
(1) Girls	10,657	48.73
Child insurance coverage		
(0) With insurance	12,356	56.50
(1) Without insurance	9,515	43.50
Mothers'/caregivers' education		
(0) None/Pre-Primary	8,122	37.14
(1) Primary	4,492	20.54
(2) Junior high school (JHS)	7,118	32.55
(3) Senior high school (SHS)	1,498	6.85
(4) Higher	641	2.93
Household wealth index		
(0) Poorest	4,867	22.25
(1) Second	4,901	22.41
(2) Middle	4,486	20.51
(3) Fourth	4,135	18.90
(4) Richest	3,483	15.92
Urban-rural residence		
(0) Urban	9,390	42.93
(1) Rural	12,481	57.07
Region of residence		
(0) Western	2,163	9.89
(1) Central	2,199	10.05
(2) Greater Accra	1,942	8.88
(3) Volta	1,880	8.59
(4) Eastern	2,569	11.74
(5) Ashanti	5,120	23.41
(6) Brong Ahafo	2,102	9.61
(7) Northern	2,559	11.70
(8) Upper East	756	3.46
(9) Upper West	582	2.66

difficulties, anxiety, and depression. The UNICEF/Washington Group Child Functioning Module (CFM) was the tool used to capture responses on the main study variables (i.e., learning difficulties, anxiety and depression). The tool was originally designed to capture data of a subpopulation of children who are at greater risk of disability or functioning impairment in population-based health surveys (Cappa et al., 2018; Massey, 2018). It consists of questions or items that cover 13 domains of functioning: vision, hearing, walking, self-care, communication, learning, remembering, concentrating, accepting change, controlling behavior, making friends, anxiety, and depression. The questions are based on the classification modules of the International Classification of Functioning, Disability, and Health for Children and Youth (ICF-CY) and popular survey questionnaire already used in several countries (Cappa et al., 2018; Massey, 2018). The domains can be examined separately (as considered in this study) to identify the specific limitations of children or combined to form a total score (Massey, 2018). The tool has been adapted and validated in several countries and reported to possess sound psychometric properties including caregiver-child pair interrater reliability (see Emerson & Llewellyn, 2021; Sprunt, McPake, &

Table 2
Adjusted model regressing anxiety and depression onto learning difficulties while controlling for other covariates.

	Anxiety			Depression		
Predictor variables		Model 2			Model 2	
	B	APOR [95% CI]	*p*	*B*	APOR [95% CI]	*p*
Learning difficulty						
No difficulty		1 [ref]			1[ref]	
Some difficulty	0.25	1.28 [1.11, 1.49]	0.001	0.22	1.24 [1.07, 1.44]	0.004
Lot of difficulty/cannot learn at all	0.20	1.22 [0.93, 1.59]	0.152	0.55	1.74 [1.28, 2.37]	<0.001
Child'sAge						
5–9 years		1 [ref]			1[ref]	
10–14 years	0.07	1.08 [0.92, 1.25]	0.351	0.14	1.15 [1.02, 1.30]	0.028
15–17 years	0.22	1.24 [1.03, 1.51]	0.027	0.35	1.42 [1.18, 1.72]	<0.001
Gender						
Boys		1 [ref]			1[ref]	
Girls	0.05	1.05 [0.93, 1.19]	0.430	0.12	1.13 [1.00, 1.28]	0.052
Child insurance coverage						
With insurance						
Without insurance	0.03	1.03 [0.90, 1.19]	0.637	0.09	1.10 [0.94, 1.28]	0.244
Mothers'/caregiverseducation						
None/Pre-primary		1 [ref]			1[ref]	
Primary	−0.09	0.91 [0.72, 1.16]	0.457	0.01	1.01 [0.83, 1.23]	0.922
Junior high school	−0.19	0.82 [0.67, 1.02]	0.069	−0.00	1.00 [0.82, 1.21]	0.974
Senior high school	−0.06	0.94 [0.72, 1.24]	0.661	−0.02	0.98 [0.76, 1.28]	0.864
Higher	0.04	1.04 [0.72, 1.50]	0.839	0.06	1.05 [0.74, 1.53]	0.756
Household wealth index						
Poorest		1 [ref]			1[ref]	
Second	0.04	1.04 [0.80, 1.36]	0.753	0.13	1.14 [0.91, 1.43]	0.254
Middle	0.05	1.05 [0.84, 1.33]	0.638	−0.11	0.89 [0.69, 1.16]	0.393
Fourth	−0.02	0.98 [0.76, 1.27]	0.895	−0.13	0.88 [0.65, 1.19]	0.406
Richest	−0.01	0.99 [0.75, 1.30]	0.927	−0.22	0.80 [0.58, 1.10]	0.165
Place of residence						
Urban		1 [ref]			1[ref]	
Rural	0.18	1.19 [1.01, 1.41]	0.042	0.02	1.02 [0.87, 1.21]	0.786
Region						
Greater Accra		1 [ref]			1[ref]	
Western	−0.68	0.50 [0.39, 0.65]	<0.001	−0.56	0.57 [0.44, 0.74]	<0.001
Central	−0.32	0.73 [0.54, 0.98]	0.036	−0.24	0.78 [0.59, 1.04]	0.099
Volta	0.02	1.01 [0.66, 1.56]	0.939	−0.13	0.87 [0.65, 1.19]	0.413
Eastern	−0.34	0.71 [0.55, 0.92]	0.009	−0.22	0.79 [0.62, 1.04]	0.413
Ashanti	−0.11	0.89 [0.68, 1.17]	0.416	0.07	1.06 [0.85, 1.37]	0.102
Brong Ahafo	−0.61	0.54 [0.40, 0.74]	<0001	−0.54	0.56 [0.42, 0.80]	0.001
Northern	0.05	1.05 [0.71, 1.57]	0.791	0.08	1.06 [0.73, 1.61]	0.697
Upper East	0.62	1.86 [1.29, 2.69]	0.001	0.87	2.30 [1.64, 3.45]	<0.001
Upper West	0.57	1.77 [1.26, 2.48]	0.001	0.38	1.46 [1.05, 2.03]	0.023
Number of observations		8,958			8,958	
N		21,855.636			21,855.747	
Strata		20			20	
Primary sampling unit		660			660	
F Statistics		F (24, 617) = 8.95, p<0001			F (24, 617) = 7.33, p<0001	

Note. 95% CI = 95% confidence intervals; APOR = Adjusted proportional odds ratio; $p < 0.05$, $p < 0.01$, $p < 0.001$.

Marella, 2019; Sprunt, Hoq, Sharma, & Marella, 2019; Zia, Bachani et al., 2020; 2020b). An earlier study using the tool reported a Cronbach's alpha of 0.89 and 0.89 calculated for the total scores for caregivers and child versions of CFM respectively (Zia, Bachani et al., 2020). The estimated Cronbach's alpha in this study was 0.80 only for the items measuring anxiety and depression due to similar scaling.

2.4.1. Outcome variables

We considered anxiety and depression as outcome variables in this study. The survey question used to measure anxiety was, "how often child seems very anxious, nervous or worried" and that of depression was, "how often child seems very sad or depressed". Participants responded to both questions on the same 5-point ordered response scale ranging from, '(0) never', '(1) a few times a year', '(2) monthly', '(3) weekly' and '(4) daily'. These questions which form part of the CFM were designed to assess a child's difficulty in expressing and managing emotions (Massey, 2018).

2.4.2. Predictor variable

Learning difficulty was treated as the predictor variable in this study. This variable was measured by asking mothers or caretakers of children to respond to a single item namely, "Compared with children of the same age, does the child have difficulty learning things?". Participants responded using this oneitem scale with 4 response options: "No difficulty", "Some difficulty", "A lot of

difficulties" and "Cannot learn at all". The question which forms part of the CFM was intended to assess learning difficulty in a child's learning environment particularly in schools (Massey, 2018). To simplify data interpretation in this study, the responses of "A lot of difficulties" and "Cannot learn at all" were combined based on the recommended cut-offs by Cappa et al. (2018). The variable was recoded as illustrated in Table 1 and used for subsequent analyses.

2.4.3. Control variables

The control variables included; child's gender, child's age, child's insurance coverage, mothers'/caregivers' education, household wealth index, rural-urban residence, and region of residence. We selected these variables based on findings from previous literature (Brunelle, Abdulle, & Gorey, 2019; Frigerio et al., 2009; Reiss, 2013) and their availability in the dataset. The categorizations of these selected variables are reported in Table 1.

2.5. Data preparation and analysis

Statistical analyses were conducted in Stata version 14. We cleaned the dataset and recoded the variables for further analyses. Sample weights were applied to enable generalizability and reduce nonresponse bias. Next, we performed univariate analysis to compute the frequency and percentages of all variables. Before performing bivariable and multivariable analyses, we activated the "svyset" command correcting for clusters, stratification, and sample weights that are associated with secondary datasets collected using complex survey designs. According to West, Sakshaug, and Aurelien (2016)), it is prudent to account for the complex sampling design so the results generated will be error-free and can be accurately generalized. The bivariable and multivariable analyses with ordered logistic regression were performed in two steps to determine the association between learning difficulties and anxiety as well as depression, reporting both crude (POR) Table A1 and adjusted proportional odd ratios (APOR) Table 2. First, we enabled the "ologit" command and regressed learning difficulty onto anxiety while not controlling for covariates as depicted in Model 1 and 2 in Table A1 in the Appendix. Second and likewise, we regressed learning difficulty onto depression and this is presented in Table A1.

2.6. Ethics and data availability

The UNICEF and GSS reported that a verbal informed child assent and parental/adult consent were obtained from each participant before data collection proceeded (Ghana Statistical Service, 2018). Additionally, anonymity and confidentiality were assured to participants as well as their rights to discontinue the survey if they wished to do so. Since the dataset used in this study was secondary in nature, no additional ethical clearance was sought by the authors aside seeking permission to access and use the dataset from UNICEF. The dataset is freely accessible at https://mics.unicef.org/surveys after completing a simple registration process and permission-seeking process.

3. Results

3.1. Summary of sample characteristics

Results showed that about 4%, 4%, and 8% of the children sampled experienced anxiety daily, weekly, and monthly respectively. In terms of depression, 3%, 3%, and 7% of the children experienced it daily, weekly, and monthly respectively. Approximately 20% of the children had had some learning difficulties whereas about 5% could not learn at all. The majority of the children were within 5−9 age cohorts (43.78%) and were boys (51.27%). About 37% of the children's mothers or caregivers had no formal education. Also, more than half of the children resided in rural areas. (57.07%). The remaining statistics of the sample characteristics are presented in Table 1.

3.2. Bivariable and multivariable analysis with ordinal logistic regression

Table 2 and Table A1 contains the results of the ordinal logistic regression. Although results from the multivariable model (Model 2) in Table 2 are the focus of interpretation, the results contained in the bivariable model (Model 1) in Table A1 are also interpreted but briefly. We first examined the relationship between learning difficulty and anxiety among children aged 5−17 years. The results showed that learning difficulty was significantly associated with anxiety in Models 1 and 2 which confirmed our first hypothesis. For Model 1, the odds of feeling anxious for children who had some learning difficulties were higher than those without learning difficulties [POR = 1.23, 95% CI:1.07, 1.41, $p = 0.005$]. However, no significant association was found between children with a lot of learning difficulties or who could not learn at all and having anxiety [POR=1.11, 95% CI:0.85, 1.45, $p = 0.428$] (see Table A1). In Model 2 while holding constant the covariates, the odds of children with some learning difficulties feeling anxious increased [APOR=1.28, 95% CI:1.11, 1.49, $p = 0.001$] (Table 2). In the same adjusted Model (2), no significant relationship was found between children who had a lot of difficulties or could not learn at all and their anxiety levels [APOR = 1.22, 95% CI:0.93, 1.59, $p = 0.152$]. In terms of the covariates, some were significantly associated with anxiety. Specifically, children aged 15−17 years [APOR=1.24, 95% CI:1.03, 1.51, $p = 0.027$], residing in rural areas [APOR=1.19, 95% CI:1.01, 1.41, $p = 0.042$], in Upper East [APOR=1.86, 95% CI:1.29, 2.69, $p = 0.001$] and Upper West [APOR=1.77, 95% CI:1.26, 2.48, $p = 0.001$] had higher odds of feeling anxious. However, children residing in Western [APOR=0.50, 95% CI:0.39, 0.65, $p < 0.001$], Central [APOR=0.73, 95% CI:0.54, 0.98, $p = 0.036$], Eastern [APOR=0.71, 95% CI:0.55, 0.92, $p = 0.009$], and Brong Ahafo [APOR=0.54, 95% CI:0.40, 0.74, $p < 0001$] regions compared

to those in the Greater Accra region had lower odds of feeling anxious (see Table 2).

Secondly, the relationship between learning difficulty and depression among Ghanaian children was also analysed. Learning difficulty was associated with depression in both Models (1 and 2) confirming the second hypothesis of the study. In Model 1, both children who had some learning difficulties [POR = 1.21, 95% CI:1.04, 1.40, $p = 0.012$] and a lot of difficulties/could not learn at all [POR=1.60, 95% CI:1.19, 2.17, $p = 0.002$] had higher odds of feeling depressed (see Table A1). In Model 2, children who had some learning difficulties [APOR=1.24, 95% CI:1.07, 1.44, $p = 0.004$] and a lot of difficulties/could not learn at all [APOR=1.74, 95% CI:1.28, 2.37, $p < 0.01$] had higher odds of feeling depressed after adjusting for covariates (see Table 2). Additionally, children aged 10−14 years [AOR=1.15, 95% CI:1.02, 1.30, $p = 0.028$] and those aged 15−17 years [APOR=1.42, 95% CI:1.18, 1.72, $p < 0.001$], who reside in the Upper East [APOR=2.30, 95% CI:1.64, 3.45, $p < 0.001$] and Upper West [AOR=1.46, 95% CI:1.05, 2.03, $p = 0.023$] regions were found to have higher odds of feeling depressed. Children residing in the Western [APOR=0.57, 95% CI:0.44, 0.74, $p < 0.001$] and Brong Ahafo [APOR=0.56, 95% CI:0.42, 0.80, $p = 0.001$] regions, on the other hand, had lower odds of feeling depressed compared to those in the Greater Accra region (see Table 2).

4. Discussion

The ability to learn and excel in life is of great value. Those, particularly children who lack such ability would struggle to achieve higher academic performance. Therefore, it is not surprising that learning difficulties can negatively affect children's future prospects and well-being. The results from this study show that difficulties with learning significantly relate to internalizing symptoms specifically anxiety and depression. After adjusting for covariates in this study, age of a child, place of residence, and region were significantly associated with anxiety and depression.

Approximately 20% of children in this study had some learning difficulties while 5.31% had a lot of learning difficulties or could not learn at all. These rates are consistent with the estimate from the U.S. showing that about 5–20% of school-going children have difficulties with learning (Cortiella & Horowitz, 2014). These figures indicate that quite a substantial number of children in Ghana have difficulties in learning and yet there is no active system of diagnosis in the basic schools to identify such children. Moreover, there are inadequate resources to aid these children in terms of how equipped teachers are and the learning materials needed to help them (Karr et al., 2020).

Children who had some learning difficulties were more likely to be anxious than those who did not have any difficulties. This is consistent with findings of Asare and Danquah (2016) who reported that about 90% of children who visited their clinic with learning difficulties exhibited some symptoms of anxiety, depression, and body image issues. School-going children are expected to succeed academically (Gaier, 2015). With the pressure to do well academically, it is understandable that children who struggle with learning and have challenges with academic performance, unlike their peers, would be emotionally disturbed. Anxiety symptoms can arise as a result of fears of being unable to understand what is being taught and answer questions (Li & Morris, 2007). These symptoms of anxiety, when ignored, could develop into a full-blown anxiety disorder.

This study also found that children with (some or complete) learning difficulties had a higher chance of feeling depressed. A study conducted by Sorrenti et al. (2019) among children in Italy corroborates our finding. The authors found that children with specific learning disorders experienced depressive symptoms during pre-adolescence. From the perspectives of the learned helplessness theory, children with learning difficulties who feel they are different from their peers in terms of academic achievements, and do not get the needed assurance that they can get better with the right resources, may experience feelings of sadness and worthlessness leading to depression. Our finding is also supported by previous studies that show that learning difficulties are associated with symptoms of depression (Asare & Danquah, 2016; Bitew, Birhan, & Wolie, 2020; Brunelle et al., 2019; Maughan, Rowe, Loeber, & Stouthamer-Loeber, 2003)

The results further showed that children aged 15−17 years were more likely to feel anxious than those aged 5−9 years. Similarly, children aged 10−14 and 15−17 years were more likely to feel depressed than those aged 5−9 years. Mental health problems are common in childhood and start to develop during such stage of life (Durbeej et al., 2019). Several studies report that adolescents may have a higher risk for psychiatric symptoms (Ullsperger & Nikolas, 2017) which could explain the age differences observed in this study. Unlike older children, younger children may not clearly express depressive symptoms or the symptoms they express may be misunderstood and labelled as something else. Additionally, older children could be experiencing more internalizing problems because they have more needs to succeed and therefore expectations may be higher. This could put pressure on them and increase the feeling of depression and anxiety.

This study also found that children in rural areas were more likely to be anxious. This is in line with Brunelle et al. (2019) who found that socioeconomically vulnerable children who had some learning difficulties were at a higher risk of being anxious and depressed than those who were from better socioeconomic backgrounds. Compared to the urban areas, those in the rural areas are poorer, lack access to health facilities, have low income, lack adequate nutrition, and are exposed to environmental stressors and barriers that can induce mental problems such as anxiety (Crouch, Radcliff, Probst, Bennett, & McKinney, 2020; Ridley, Rao, Schilbach, & Patel, 2020).

We also found that children residing in Upper East and Upper West regions were at greater odds of being anxious or depressed compared to children in the Greater Accra region. On the contrary, children residing in Western, Central, Eastern, and Brong Ahafo regions were less likely to experience anxiety and depression. Reasons for these regional variations are not fully known to the authors and thus, more research is required to examine these variations. Nevertheless, Upper East and Upper West are known to be amongst the poorest regions in the country that lack basic social amenities, are characterized by increased child maltreatment practices and rank lowly on several aspects of development including social, infrastructure, education and health (Akyeampong, Djangmah, Oduro,

Seidu, & Hunt, 2007; Dako-Gyeke, 2019). Perhaps, the effects of these inadequate resources and cruel practices are responsible for children's heightened risk of anxiety and depression. This is consistent with literature indicating increased levels of anxiety and depression among children due to poor access to healthcare (LaGrant, Marquis, Berg, & Grinspan, 2020) and frequent experiences of abuse (Pengpid & Peltzer, 2020).

4.1. Policy implications

The findings of this study are vital for expanding the literature on the mental health of children in Ghana. It calls on the government of Ghana and Ghana Education Service to prioritize the mental health of all school-going children, particularly those with learning difficulties. This is because children who may have some learning difficulties are further burdened with some psychological stressors when they do not receive adequate support in the form of special education. This study also highlights the need to educate all stakeholders about learning difficulties and the repercussions on children who may be experiencing it, reduce stigmatization of these children and encourage the support of family and friends. This study also encourages educators to promote their learning abilities and find new avenues to assist children with learning difficulties. Non-governmental organizations and support groups interested in the special education of children can also use information from this study to guide their advocacies and programs. Therefore, any policies, programs or interventions set up to promote the education of children in Ghana must take into consideration the difficulties that some children may have with learning.

4.2. Strengths and limitations

One strength of this paper is the use of a nationally representative dataset which enhances generalizability and reliability of findings by reducing the potential errors associated with sampling bias. However, our findings ought to be interpreted with caution due to some limitations. First, the data we used was cross-sectional. As such, the results presented are solely correlational and do not establish causality. Future studies should strive to use longitudinal study designs to establish causality between a learning difficulty and the mental health of children. Second, although the items of the CFM used in this study were reported to have undergone rigorous field testing and validation process, there might have some degree of self-reporting bias as mothers/primary caregivers could have responded in ways that may minimize or magnify the symptoms of their children. Moreover, the measures were not diagnostic, they were designed only to classify a subpopulation of children at risk of disability. Therefore, future large-scale studies amongst Ghanaian children should endeavour to employ more diagnostic tools to see if the established association between learning difficulty and internalizing symptoms remains.

4.3. Conclusions

This study has established an association between learning difficulty and internalizing problems (anxiety and depression) of children aged 5−17 years in Ghana. After controlling for other covariates, children who had some learning difficulties were found more likely to be anxious than those who had no learning difficulty. Compared to children without learning difficulties, those with some learning difficulties, a lot of difficulties, or cannot learn at all were more likely to be depressed. Also, children aged 10−14, 15−17 years, dwelling in the rural areas and those residing in Upper East and Upper West regions were more likely to feel anxious and depressed. These findings collectively provide useful information for policymakers, researchers and practitioners to optimize interventions and policies targeted at improving learning outcomes and reducing the mental health problems of Ghanaian children. Also, education directors and health authorities must collaborate to develop health and social interventions that will complement the existing interventions at schools to improve the mental health and well-being of Ghanaian children.

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Author contribution

Queen Angela Norman (QAN): Conceptualization; Investigation; Roles/Writing - original draft; Writing - review & editing.

Nutifafa Eugene Yaw Dey (NEYD): Conceptualization; Data curation; Formal analysis; Project administration; Writing - review & editing; Supervision.

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Henry Ofori Duah (HOD): Conceptualization; Formal analysis; Methodology; Resources; Software; Writing - review & editing.

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Declaration of Competing Interest

The authors report no declarations of interest.

Table A1
Unadjusted models regressing anxiety and depression onto learning difficulties.

Predictor variables	Anxiety Model 1	Depression Model 1
	POR [95% CI]	POR [95% CI]
Learning difficulty		
No difficulty	1[ref]	1[ref]
Some difficulty	1.23** [1.07, 1.41]	1.21* [1.04, 1.40]
Lot of difficulty/cannot learn at all	1.11 [0.85, 1.45]	1.60** [1.19, 2.17]
Child'sAge		
5−9 years	1 [ref]	1 [ref]
10−14 years	1.06 [0.91, 1.23]	1.14** [1.01, 1.29]
15−17 years	1.22* [1.01, 1.47]	1.40*** [1.17, 1.67]
Gender		
Boys	1 [ref]	1 [ref]
Girls	1.04 [0.91, 1.18]	1.10 [0.97, 1.25]
Child insurance coverage		
With insurance		
Without insurance	1.06 [0.93, 1.22]	1.16* [1.00, 1.33]
Mothers'/caregivers'education		
None/Pre-primary	1 [ref]	1 [ref]
Primary	0.79** [0.63, 0.99]	0.88 [0.73, 1.06]
Junior high school	0.69*** [0.57, 0.83]	0.82** [0.69, 0.97]
Senior high school	0.77** [0.60, 0.99]	0.77** [0.61, 0.98]
Higher	0.86 [0.60, 1.23]	0.80 [0.58, 1.12]
Household wealth index		
Poorest	1 [ref]	1 [ref]
Second	084 [0.67, 1.07]	0.98 [0.81, 1.18]
Middle	0.80** [0.64, 0.99]	0.76** [0.62, 0.94]
Fourth	0.71*** [0.56, 0.91]	0.77** [0.61, 0.97]
Richest	0.70*** [0.55, 0.88]	0.67*** [0.55, .83]
Place of residence		
Urban	1 [ref]	1 [ref]
Rural	1.27** [1.08, 1.48]	1.15** [1.01, 1.32]
Region		
Greater Accra	1 [ref]	1 [ref]
Western	0.57*** [0.44, 0.73]	0.64*** [0.50, 0.84]
Central	0.82 [0.61, 1.09]	0.92 [0.70, 1.21]
Volta	1.19 [0.76, 1.87]	1.04 [0.78, 1.37]
Eastern	0.81 [0.64, 1.03]	0.93 [0.73, 1.20]
Ashanti	0.98 [0.75, 1.28]	1.19 [0.94, 1.52]
Brong Ahafo	0.61*** [0.45, 0.81]	0.65** [0.48, 0.88]
Northern	1.25 [0.89, 1.77]	1.23 [0.86, 1.75]
Upper East	2.21*** [1.67, 2.93]	2.65*** [1.93, 3.62]
Upper West	2.19*** [1.70, 2.83]	1.70*** [1.30, 2.23]
Number of observations	8,958	8,958
N	21,855.747	21,855.747
Strata	20	20
Primary sampling unit	660	660

Note. 95% CI = 95% confidence intervals; POR = Proportional odds ratio; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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Appendix A

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