Child Abuse & Neglect 117 (2021) 105028

Contents lists available at ScienceDirect

Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg

Impact of child's cognitive and social-emotional difficulties on child abuse: Does mother's justification of intimate partner violence also play a role?

Awan Afiaz *, Mohammad Shahed Masud, Mohaimen Mansur

Institute of Statistical Research and Training (ISRT), University of Dhaka, Dhaka, 1000, Bangladesh

ARTICLE INFO

Keywords:
Child abuse
Physical violence
Sociodemographic
Machine learning
Cognitive difficulty
Social-emotional

ABSTRACT

Background: Violence against children has been a persistent problem in developing nations. The adverse effects of physical violence bear a considerable impact on children's physical and psychological development resulting in both short and long-term issues.
Objective: The aim of this study was to explore whether children with cognitive and social-emotional difficulties (CSEDs) were at a higher risk of experiencing physical abuse and whether mothers' views on intimate partner violence (IPV) were also related to physical abuse against children.
Participants and Setting: The Bangladesh Multiple Indicator Cluster Survey-2019 was used with a sample of 27,086 children aged 5–14.
Methods: Generalized linear modelling along with a machine learning method of classification trees was employed to investigate the important sociodemographic characteristics and identify the most vulnerable groups of children based on their likelihood of exposure to household-violence.
Results: Nearly 62.5 % of the children were physically abused by their mothers. Children with CSEDs were 53 % (OR 1.53; 95 % CI: 1.41, 1.67) more likely to experience physical abuse and mothers' justification of IPV was associated with a 16 % higher risk (OR 1.16; 95 % CI: 1.08, 1.26). Moreover, younger children aged 11 or below belonged to the high-risk groups of experiencing abuse.
Conclusions: The findings suggest that violence against children is widespread in Bangladesh, especially in children having CSEDs. Mothers' acceptance of IPV was also associated with increased abusive practice against children. Sincere focus on these issues is imperative if Bangladesh intends to achieve the sustainable development goal 16.2 of eradicating all forms of violence against children and ensure their safe development.

1. Introduction

Violence against children at home, although the most common form of violence against children, is a seriously neglected issue. This is particularly true for many developing nations (Jones et al., 2012; Ofoha & Ogidan, 2020; United Nations, 2009). All forms of physical or psychological violence are harmful to children as they aggravate injuries, and hinder individual physical, cognitive and

* Corresponding author.
E-mail addresses: aafiaz@isrt.ac.bd (A. Afiaz), smasud@isrt.ac.bd (M.S. Masud), mmansur@isrt.ac.bd (M. Mansur).

https://doi.org/10.1016/j.chiabu.2021.105028
Received 24 June 2020; Received in revised form 20 January 2021; Accepted 9 March 2021
Available online 26 March 2021

social development (Bremner, 2003; Buckingham & Daniolos, 2013; UNICEF, 2017). There exists a tacit consensus regarding the necessity of such violence, particularly in developing and low-income countries and these are often socially accepted practices of child disciplining (Akmatov, 2011; Gagné et al., 2007). Such social makeups have played a fundamental role in building up a tradition of child abuse behind closed doors (UNICEF, 2017). Furthermore, from the victims' perspective, the familiarity and impunity of perpetrators, as well as the fear of reprisal have disguised it as a normal behavior resulting in a lack of recognition of the problem (UNICEF, 2017).

Child disciplining is an essential aspect of parenthood and an important part of a child's formative years. Alarmingly, however, such disciplining actions often take the course of corporal punishment even though there exist healthier and developmentally more acceptable manners of disciplining (Akmatov, 2011; Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019). Around 63 percent of children are subjected to physical punishment worldwide and nearly 1 in 4 caregivers support physical punishment as a compulsory form of child disciplinary measure (UNICEF, 2017). The dissonance between a child's cognitive abilities or actions and parental expectations along with a lack of awareness regarding the harmful effects of child-beating and other factors including cultural practices play key roles behind this abusive social malpractice (Hunt & Paraskevopoulos, 1980; Rikhy et al., 2010; Twentyman & Plotkin, 1982).

The short and long-term physical and psychosocial effects of child abuse have been studied extensively. In clinical psychiatry, it is well-documented that adverse/traumatic experiences during childhood cause lasting physical, emotional, behavioral, cognitive and social problems (Bremner, 2003; Perry & Pollard, 1998; Read, Perry, Moskowitz, & Connolly, 2001). However, the determination of actual effects of child abuse is often masked by the underreporting of cases or diagnosis of injuries or illnesses resulting from child abuse as unrelated incidents (Martin, Volkmar, & Lewis, 2007). Recent studies also reveal that childhood maltreatment is likely to result in an increased risk of depression, anxiety, post-traumatic stress disorder (PTSD), substance abuse and reduced academic achievement in adulthood along with unemployment and poverty (Buckingham & Daniolos, 2013; Johnson & James, 2016; Zielinski, 2009).

While the consequence of violent child disciplining on children's cognitive and social-emotional well-being has been extensively studied, the reverse question of whether a child's cognitive and social-emotional difficulties (CSEDs) make him/her more vulnerable to parental maltreatment has attracted little attention in the literature till now. Yet, a few studies found children with physical or cognitive disabilities to be at higher risk of becoming victims of abuse (Ammerman et al., 1989; Sullivan & Cork, 1996; Sullivan & Knutson, 2000). Possible reasons for this additional risk are that children with such difficulties are likely to fall short of meeting the expectations of their parents in academic performance-related aspects as well as needing more support than other children without such difficulties (Buckingham & Daniolos, 2013; Kieling et al., 2011). Thus, higher emotional, physical, economic and social demands on the parents result in a greater incidence of maltreatment, often physical in nature, toward their children with CSEDs (Benedict, White, Wulff, & Hall, 1990). However, most of such studies were conducted in developed countries which pointed to the fact that there exists a study gap in low-and-middle-income countries (LMICs) such as Bangladesh regarding this issue.

Another social phenomenon that is sometimes linked to child abuse is mothers' experience of intimate partner violence (IPV). Some studies have attempted to conceptualize this relationship through theoretical arguments (Assink et al., 2018; Little & Kantor, 2002). There is also empirical evidence that women who were subjected to IPV showed increased potential for child abuse in comparison to non-victims (Casanueva & Martin, 2007). Interestingly, yet unfortunately, women in several parts of the world preserve approval to any violent ordeal committed against them. For example, in South and Central Asia, the proportion of women who accept wife-beating is around 57 % (Rani & Bonu, 2009).

This study aims to investigate whether children's experience of cognitive and social-emotional difficulties (CSEDs) and their mothers' justification for intimate partner violence (IPV) are associated with increased physical abuse of children at the hands of their mothers. The study addresses this question in the context of Bangladesh both from theoretical and empirical perspectives. A major motivation comes from the fact that there is a paucity of literature that explores sociodemographic contexts of violent disciplining of children by physical abuse, particularly in low-income countries like Bangladesh. Worryingly, physical child disciplining is not only highly prevalent in Bangladesh with more than 60 % of children being physically abused at home by mothers or caretakers, but also considered as a socially accepted practice as 35 % of mothers report believing that a child needs to be physically punished in order to be disciplined (Atiqul et al., 2017; Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019). Although physical abuse has been outlawed in Bangladeshi schools, such practices are still at large within households. The costs of such an ordeal are also high and often long-lasting. A recent study found that children in Bangladesh experience various forms of abuse at home, and these strict disciplining measures in the form of physical abuse were associated with children dropping out of school (Moniruzzaman, Eriksson, & Janson, 2016). Furthermore, a study on the experience of corporal punishment on children reported that most children viewed physical punishment to be harsh overall, but the children, however, considered it justified (Uddin, 2013).

The present condition of cognitive and social-emotional difficulties (CSED) in children and intimate partner violence (IPV) justified by mothers also pose significant challenges for Bangladesh. According to the UNICEF MICS report 2019, in Bangladesh, almost 73 % of young children below the age of five years fail to reach the full potential for social-emotional development. However, CSEDs in children rarely receive social recognition since these are not as apparent as a physical disability might be. IPV has long been and continues to be a major public health issue in Bangladesh (Afiaz et al., 2020), and women's justification of such violent abuse is also prevalent (Biswas et al., 2017). It is, therefore, worth exploring whether these experiences of difficulties by children and approval of domestic atrocities by their mothers play any role in the subsequent acts of violence towards children in the country. Moreover, there is extant literature that supports that parents' beliefs regarding violence and experience of interpersonal violence could result in child maltreatment (Browne, 1988).

The discussion above endorses the need for a study that contextualizes the physical abuse of children from a sociodemographic

perspective in Bangladesh. An acknowledgement of the issues regarding child abuse puts forth the first step to identify the most vulnerable groups of children who are often subjected to physical abuse. The fundamental rationale behind this study is that children who experience cognitive and social-emotional difficulties require additional support compared to other children without such difficulties. However, instead of providing support to the children in need of help with these difficulties, the response to such issues is often expressed in the form of physical or psychological abuse.

The study objective is three-fold. The first objective is to identify and contextualize the important sociodemographic factors behind the physical abuse of children through a theoretical framework. The second objective was to empirically examine the hypothesis that children's cognitive and social-emotional difficulties (CSEDs), as well as the mother's justification of IPV, increase the likelihood of experiencing physical abuse by the children. To our knowledge, this study is the first of its kind which utilizes data from a large-scale nationally representative survey to investigate this unexplored question for Bangladesh. The third and final objective is to identify groups of children who are at high risks of being physically abused by utilizing an interpretable machine learning method. These findings may help design intervention strategies aimed at the vulnerable groups and aiding Bangladesh in achieving the sustainable development goal (SDG) 16.2 of ending all forms of violence against children with meaningful success (United Nations, 2015).

2. Theoretical framework

The current analysis is based on the conceptual ecological framework proposed by Browne (1988) that conceives the child along with his/her family and the community as "an interactive set of systems nested within each other". Browne (1988) discussed her ecological model based on four predisposing factors that render the child susceptible to maltreatment with the presumption that these

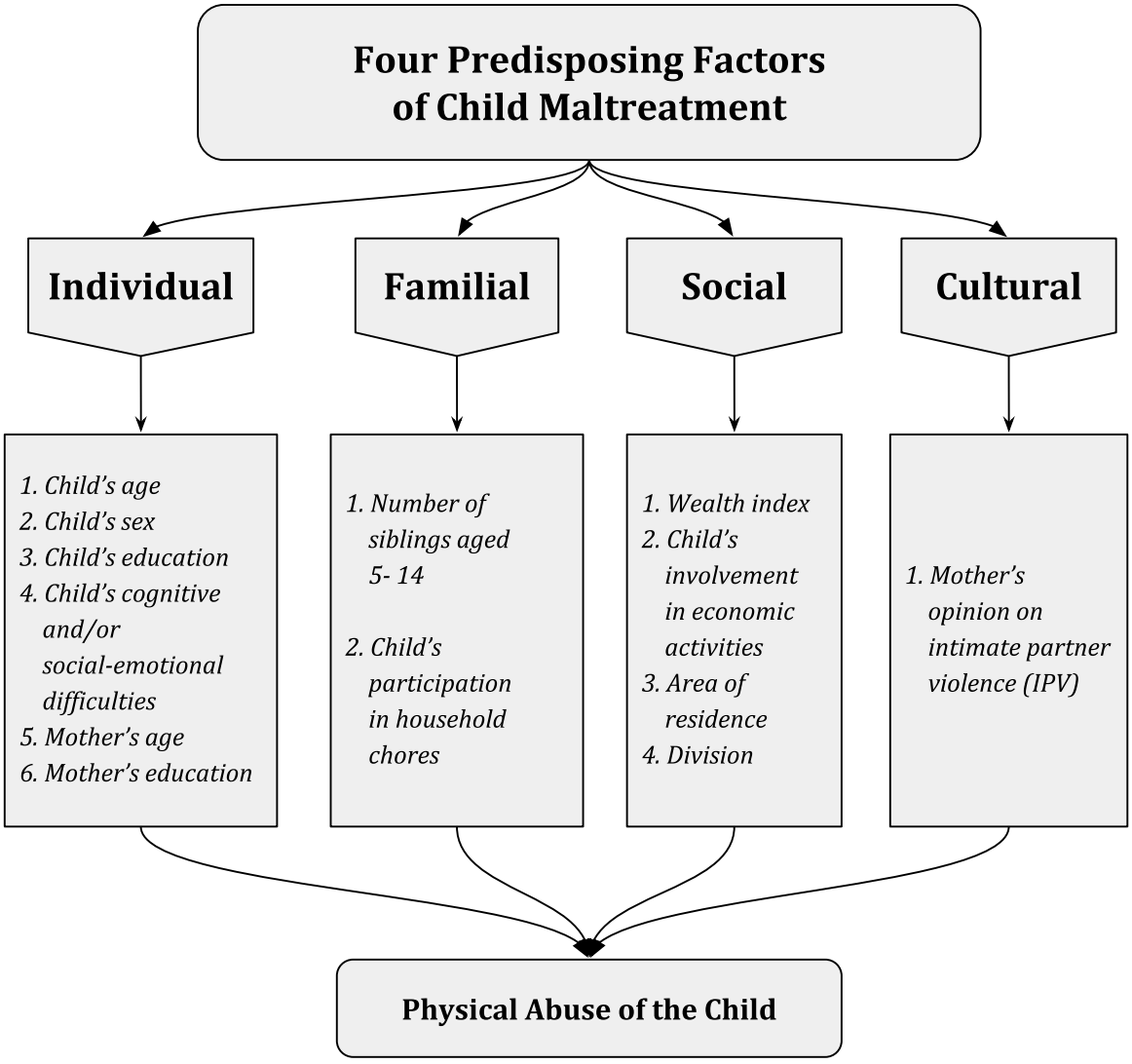

Fig. 1. The predisposing factors of child maltreatment in the context of the current study according to Browne's ecological model.

four levels of individual, familial, social, and cultural factors are mediated by social supports or networks which ultimately results in abuse. The individual factors are the characteristics possessed by the child-victims and their parents based on their unique attributes. Familial factors involve the structure as well as the interactions and functions of the family. Quality of housing, formal and informal relationships and employment are encompassed by the social factors. Lastly, the ideological fabrics that connect the individuals to society and those beliefs that favor violence and punishment are discoursed among the cultural factors.

The advantage of this model lies in the fact that the framework integrates a confluence of multiple single-factor theories into a multifactor paradigm that allows the conduction of empirical investigation (Browne, 1988). The variable selection for the current study was therefore based on this ecological framework and the subsequent availability of pertinent variables in the survey data and is depicted in Fig. 1. The present analysis will only focus on the identification of the predisposing factors likely to be responsible for child maltreatment in the form of physical abuse perpetrated by their mothers.

3. Materials and methods

3.1. Data overview

The present analyses were performed using the most recent Bangladesh Multiple Indicator Cluster Survey (MICS) 2019 (Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019) which is conducted by BBS and financed and supervised by UNICEF. This is a nationally representative sample survey conducted by employing a two-stage, stratified cluster sampling approach to collect information on demographic and various health, nutrition and education-related metrics for women and children. The 64 districts of the country were considered as the sample strata with the enumeration areas (EAs) being the primary sampling units and households as the secondary sampling units. An updated version of the 2011 Bangladesh Census of Population and Housing was utilized to create the sampling frame. A total of 3,220 EAs were selected from the strata using the probability proportional to size (PPS) method in the first stage of sampling. In the second stage, utilizing a random systematic selection procedure (UNICEF MICS, 2019), a sample of 20 households was selected from each sampled EA. This yielded a final sample of 64,400 households, with approximately 1,000 households from each stratum (Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019).

The questionnaire for children aged 5−17 years was employed in each sample household by randomly choosing one child in the specified age group from all the children of the same age group available in that household using the information from the list of household members. The full questionnaire was answered by the respective mother of the selected child. The sample weights for this children dataset were adjusted and then normalized based on the response rate for this questionnaire first at the stratum level, and then the number of children in that household (Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019). Next, the working dataset was constructed by combining the individual datasets on children aged 5−17 years and their respective mothers. The study employed a complete records analysis (CRA) approach by removing the cases with any missing values. As prescribed in the UNICEF MICS report and data availability on child abuse only for children aged 5–14, the present study considered only the below higher secondary level school-children between 5–14 years of age living with their mothers. After retaining the cases without any missing values, the final sample size for the study was 27,086.

3.2. Ethical statement

This study was based on the analysis of national-scale survey data from UNICEF, where all the personally identifiable information of participants had been removed. Informed consent was taken from participants before participating in the survey by the national statistical office, Bangladesh Bureau of Statistics and UNICEF. The datasets are freely available online on the UNICEF MICS website.

3.3. Independent variables

The sociodemographic characteristics of the children and their mothers along with the household information were taken into account based on the theoretical framework. The variables related to the children's and their mothers' 'individual' characteristics included child's age (in years), child's sex (male, female), child's education level (pre-primary or no education, primary, secondary), mother's age (in years), mother's education level (pre-primary or no education, primary, secondary, higher). A binary variable was constructed named 'child's cognitive and social-emotional difficulties' (CSED) (yes, no) based on a child's functional difficulties pertaining to cognitive capabilities and social-emotional stability (Golinkoff, Singer, & Hirsh-Pasek, 2006). The cognitive abilities included the child's learning, remembering and concentration capabilities while the social-emotional issues included difficulty with accepting changes to life/routine, controlling their behavior in tough situations, and making friends. These six binary variables based on which the variable CSED was constructed were categorical variables and were retained from questions used in developing a well-recognized valid instrument for measuring functional difficulties/disabilities in children by UNICEF in collaboration with the Washington Group of Disability Statistics (WG) (Loeb et al., 2017). These questions are part of the standard Developmental Disorders-Children Disability Assessment Schedule (DD-CDAS) by WHO and have performed as a reliable, valid and sensitive-to-change measure of functional disability in low resource settings (Hamdani et al., 2020). Each of these six categorical variables included the following 4 levels: no difficulty, some difficulty, a lot of difficulty, and cannot do it at all. A child was considered having no difficulty (binary "no" group) if the mother responded negatively to all six questions and the child was considered having one or more such difficulties if their mothers responded affirmatively (at least some difficulty) to the respective questions.

The familial factors included the child's participation in various household chores, such as shopping, cooking, washing clothes and

dishes, cleaning around the house, caring for children/elderly, or other household tasks. These were also collapsed into a binary variable named 'child's participation in household chores' (yes, no) if the child took part in any one of these activities. Moreover, the number of siblings aged 5−17 in the household was considered as a categorical variable with three levels (none, one, two or more).

The binary variable named 'child's involvement in economic activities' (yes, no) was created where a child's involvement in economic/earning activities was taken into account. These activities included working in the garden, helping in the family business, production and selling activities, collecting firewood, fetching water, or engaging in any other economic undertakings in accordance with Resolution I, Section 22(b), of the 19th International Conference of Labour Statisticians (International Labour Organization, 2013). An affirmative answer to the binary (yes, no) questions that asked about the child's involvement in such activities were coded into 'yes' and 'no' if otherwise. Furthermore, household wealth index quintile (poorest, poorer, middle, richer, richest), area of residence (rural, urban), administrative division (Dhaka, Barishal, Chattogram, Khulna, Mymensingh, Rajshahi, Rangpur, Sylhet) also belonged to the 'social' factors of the study framework.

Lastly, the cultural aspect of the theoretical framework was addressed by mothers' justification of intimate partner violence (IPV). The survey contained 5 binary variables regarding women's justification of IPV which included: justifying IPV in cases of going out without telling the husband, neglecting the children, arguing with husband, accidentally burning food, and refusing to have sex. Following UNICEF MICS guidelines (Bangladesh Bureau of Statistics BBS & UNICEF Bangladesh, 2019) and existing literature (Biswas et al., 2017) these 5 binary variables were coded into a combined binary variable (yes, no) named mother's justification of IPV. If the woman (mother of the child) responded 'no' of all the five binary variables, then it was considered as the binary 'no' for the women's justification of IPV variable, otherwise, it was considered 'yes'. This standard set of questions as well as the binary indicator devised from these questions are regularly used in DHS surveys for measuring attitudes regarding IPV (Yount et al., 2014) and have been employed in the previous MICS. It has been well-documented that a number of sociodemographic variables that have been associated with the act of IPV itself have also been associated with justification with IPV in past research and among them women's age, household's economic condition, partner's level of education were of notable importance (Afiaz et al., 2020; Biswas et al., 2017; Tran et al., 2016). In this study, the same technique was employed in creating this binary variable as in the previously stated pertinent studies.

3.4. Outcome variable

The study considered the binary outcome variable regarding the mother's use of any form of physical abuse on the child. This variable was constructed based on the answers to the following six binary (yes, no) questions: (a) shook child, (b) spanked, hit or slapped child on the bottom with the bare hand, (c) hit child on the bottom or elsewhere with belt, brush, stick, etc., (d) hit or slapped child on the hand, arm or leg, (e) hit or slapped child on the face, head or ears, and (f) beat child up as hard as one could (UNICEF, 2017). An affirmative response to any one of these questions was coded as 'yes' and 'no' otherwise for the binary outcome. Again, the questions used to create this variable were readily available in the MICS dataset and are commonly used for developing popular and validated instruments for assessing treatment of children e.g., Parent-Child Conflict Tactics Scale (CTS-PC) and family violence e.g., WorldSAFE Survey questionnaire (MICS & UNICEF, 2006).

3.5. Statistical analyses

The statistical analyses were performed in three stages. Firstly, the primary associations between the sociodemographic factors in the study and the outcome variable were assessed by conducting bivariate analyses including chi-square tests of associations (Agresti & Kateri, 2011). In the second stage, a Generalized Linear Model (GLM) was used (McCullagh, 2018). The outcome variable was fitted to the study variables using a binary logistic regression model where the model was adjusted for cluster and strata-wise variations along with the survey weights in order to generalize the findings. All analyses were carried out in R (*version 3.6.0*) where the "*gmodels*" package (*version 2.18.1*) was used for the bivariate analyses and the binary logistic regression model (GLM) was fitted using the "*survey*" package (*version 4.0*).

In the third stage of the analysis, a machine learning approach was employed by means of constructing a weight-adjusted classification tree (James et al., 2013) with a view to identifying the interactions between the most important predictors of physical violence against children which would be of prime consideration for policy recommendation. In the present analysis, we opted to use the conditional inference framework proposed by Hothorn et al. (2006) that avoids much of the criticism typically received by standard classification tree techniques. Since classification trees are not dependent on probabilistic distributional assumptions, we used the 'proportion test' to ascertain the risk profiles of most vulnerable groups of children at risk of experiencing child abuse in order to assess the statistical significance of the important nodes.

Lastly, the squared adjusted generalized variance inflation factor (GVIF) scores were assessed to detect any presence of multicollinearity in the model (Fox & Monette, 1992). Furthermore, following the recommendation made by Benjamin et al. (2018), the present analysis considered 0.005 as the level of significance threshold for all analyses. This suggestion was followed on the grounds of ensuring reproducibility in scientific research in cases of new discoveries. Hence, the associations from the model were termed as significant if the p-values were less than 0.005.

4. Results

4.1. Descriptive analyses

Table 1 presents the distribution of children by different sociodemographic, individual maternal and household characteristics considered in the study with percentages of abused victims. Overall, 62.5 % of children were found physically abused at home. The mean age of the children in the study was 9.3 years while their mothers had a mean age of 33.4 years. A higher proportion of male children experienced physical abuse (65.2 %), in comparison to female children (59.7 %). Among children who had either no education or only pre-primary level education, nearly 77 % faced physical punishments from mothers. These proportions were lower in children who were in primary (68.5 %) or secondary (41.0 %) levels. Mothers with either no or very low education and also those with higher than secondary level of education showed less prevalence of child-beating behavior (59.2 % and 57.5 %), compared to mothers who had either primary or secondary level education (63.8 % and 64.2 %). The proportions of children who lived either in rural or urban areas and are also subject to abuse were quite similar. This was also the case across the number of similarly aged siblings in the households with proportions ranging from 61.5 % to 63.2 %. Among all the wealth groups, children living in the richest of households experienced abuse the least (57.2 %), while the proportion abused was the highest (64.8 %) among children coming from the poorest households. The percentage of abuse was the highest in children living in the Dhaka division (66.1 %) while it was the lowest in children from the Rajshahi division.

A lower prevalence of abuse was reported in children who took part in household chores (60.1 %) in contrast to those who did not

Table 1
The distribution of children physically abused at home by their sociodemographic characteristics and other study variables (categorical and continuous) among children aged 5-14 years from MICS 2019.

Sociodemographic variables	Groups	N (%) of all children in the study	N (%) of physically abused children	p-value
Child's sex	Male	13833 (51.1)	9022 (65.2)	<0.001
	Female	13253 (48.9)	7910 (59.7)	
Child's age (Mean [SD])		9.3 [2.9]		
Child's education level	Pre-primary or no education	4381 (16.2)	3369 (76.9)	<0.001
	Primary	15451 (57.0)	10588(68.5)	
	Secondary	7254 (26.8)	2975 (41.0)	
Mother's age (Mean [SD])		33.4 [6.6]		
Mother's education level	Pre-primary or no education	5203 (19.2)	3079 (59.2)	<0.001
	Primary	7654 (28.3)	4882 (63.8)	
	Secondary	11753 (43.4)	7547 (64.2)	
	Higher	2476 (9.1)	1424 (57.5)	
Area of residence	Rural	21897 (80.8)	13724 (62.7)	0.254
	Urban	5189 (19.2)	3208 (61.8)	
Wealth index	Poorest	6470 (23.9)	4194 (64.8)	<0.001
	Poorer	5971 (22.0)	3842 (64.3)	
	Middle	5417 (20.0)	3441 (63.5)	
	Richer	4932 (18.2)	2997 (60.8)	
	Richest	4296 (15.9)	2458 (57.2)	
Administrative division	Dhaka	5443 (20.1)	3597 (66.1)	<0.001
	Barishal	2479 (9.2)	1449 (58.5)	
	Chattogram	4889 (18.0)	3082 (63.0)	
	Khulna	4279 (15.8)	1951 (60.8)	
	Mymensingh	1528 (5.6)	932 (61.0)	
	Rajshahi	3182 (11.7)	1739 (54.7)	
	Rangpur	3401 (12.6)	2220 (65.3)	
	Sylhet	1885 (7.0)	1197 (63.5)	
Number of siblings aged 5−17 at home	None	13044 (48.2)	8231 (63.1)	0.025
	One	10026 (37.0)	6163 (61.5)	
	Two or more	4016 (14.8)	2538 (63.2)	
Child participates in household chores	No	15044 (55.5)	9691 (64.4)	<0.001
	Yes	12042 (44.5)	7241 (60.1)	
Child is involved in economic activities	No	17762 (65.6)	11434 (64.4)	<0.001
	Yes	9324 (34.4)	5498 (59.0)	
Child experiences cognitive and social-emotional difficulties	No	21216 (78.3)	12844 (60.5)	<0.001
	Yes	5870 (21.7)	4088 (69.6)	
Mother's opinion on IPV	Not justified	19342 (71.4)	11810 (61.1)	<0.001
	Justified	7744 (28.6)	5122 (66.1)	
Total sample size	N	27086	16932 (62.5)	

take part in these chores (64.4 %). This also applied to the children involved in some sort of economic activities (59.0 % abused) compared to children who took no part in these activities (64.4 % abused). Proportion of children struggling with various cognitive or emotional difficulties (CSEDs) who experienced abuse is nearly 10 percentage points higher than the proportion in those who did not have such issues. Lastly, children whose mothers justified IPV perpetrated by their husbands were abused in higher proportions (66.1 %), compared to those whose mothers did not hold the same opinion (61.1 %).

4.2. Logistic regression model

Table 2 shows that the age of children is negatively associated with child maltreatment with each year increase in age implying 20 % lower odds of physical abuse. Male children were at 36 % higher risk of experiencing physical abuse (OR 1.36 with 95 % CI: 1.27, 1.45) compared to their female counterparts. Children studying at the primary level of education had nearly 30 % higher odds of being abused (OR 1.29 with 95 % CI: 1.15, 1.44) in comparison to children having only pre-primary or no education. The likelihood of experiencing abuse in children having two or more siblings was 20 % higher (OR 1.22 with 95 % CI: 1.11, 1.34) than the odds in children having no siblings. Having highly educated mothers was associated with a 33 % lower risk of abuse when compared to having mothers who were illiterate or only educated at a pre-primary level. Children with older mothers showed decreased odds of exposure to physical abuse (OR 0.97 with 95 % CI: 0.96, 0.98). In comparison to children living in the poorest households, the odds of physical abuse in children belonging to the richest wealth quintile was 28 % lower. In urban households, the chance of physical abuse was approximately 20 % higher when compared to rural households (OR 1.19 with 95 % CI: 1.08, 1.32). Children residing in Rajshahi, Barisal, Mymensingh, Rangpur, and Khulna divisions had significantly reduced odds of experiencing physical abuse than children residing in the Dhaka division.

Children who experienced one or more CSEDs were at more than 50 % higher risk of physical abuse than children who had no such difficulties (OR 1.53 with 95 % CI: 1.41, 1.67). Furthermore, children whose mothers justified IPV were 16 % (OR 1.16 with 95 % CI:

Table 2
Generalized linear model (GLM) fitted with the binary outcome variable physical abuse of child (yes, no) to the sociodemographic factors, adjusting for survey weights and cluster and strata-wise variations.

Variables	Odds Ratio (95 % CI)	p-value
Child's age (in years)	0.80 (0.78, 0.82)	<0.001
Sex of Child (ref: Female)		
Male	1.36 (1.27, 1.45)	<0.001
Child's education level		
(ref: Pre-primary or no education)		
Primary	1.29 (1.15, 1.44)	<0.001
Secondary	1.03 (0.87, 1.21)	0.731
Number of siblings aged 5−17 at home (ref: None)		
One	1.07 (1.00, 1.14)	0.047
Two or more	1.22 (1.11, 1.34)	<0.001
Mother's age	0.97 (0.96, 0.98)	<0.001
Mother's education level		
(ref: Pre-primary or no education)		
Primary	0.98 (0.88, 1.08)	0.650
Secondary	0.89 (0.80, 0.98)	0.022
Higher	0.67 (0.58, 0.78)	<0.001
Wealth index (ref: Poorest)		
Poorer	1.01 (0.91, 1.11)	0.914
Middle	1.06 (0.95, 1.18)	0.301
Richer	0.91 (0.81, 1.03)	0.131
Richest	0.72 (0.63, 0.83)	<0.001
Area of residence (ref: Rural)		
Urban	1.19 (1.08, 1.32)	<0.001
Division (ref: Dhaka)		
Barishal	0.47 (0.42, 0.54)	<0.001
Chattogram	0.89 (0.79, 1.00)	0.049
Khulna	0.82 (0.73, 0.93)	0.001
Mymensingh	0.67 (0.57, 0.79)	<0.001
Rajshahi	0.47 (0.41, 0.53)	<0.001
Rangpur	0.80 (0.71, 0.91)	0.001
Sylhet	0.86 (0.74, 1.01)	0.062
Child is involved in economic activities (ref: No)		
Yes	0.99 (0.92, 1.07)	0.811
Child participates in household chores (ref: No)		
Yes	1.27 (1.17, 1.37)	<0.001
Child experiences cognitive and social-emotional difficulties (CSEDs) (ref: No)		
Yes	1.53 (1.41, 1.67)	<0.001
Mother's opinion on IPV		
(ref: Not justified)		
Justified	1.16 (1.08, 1.26)	<0.001

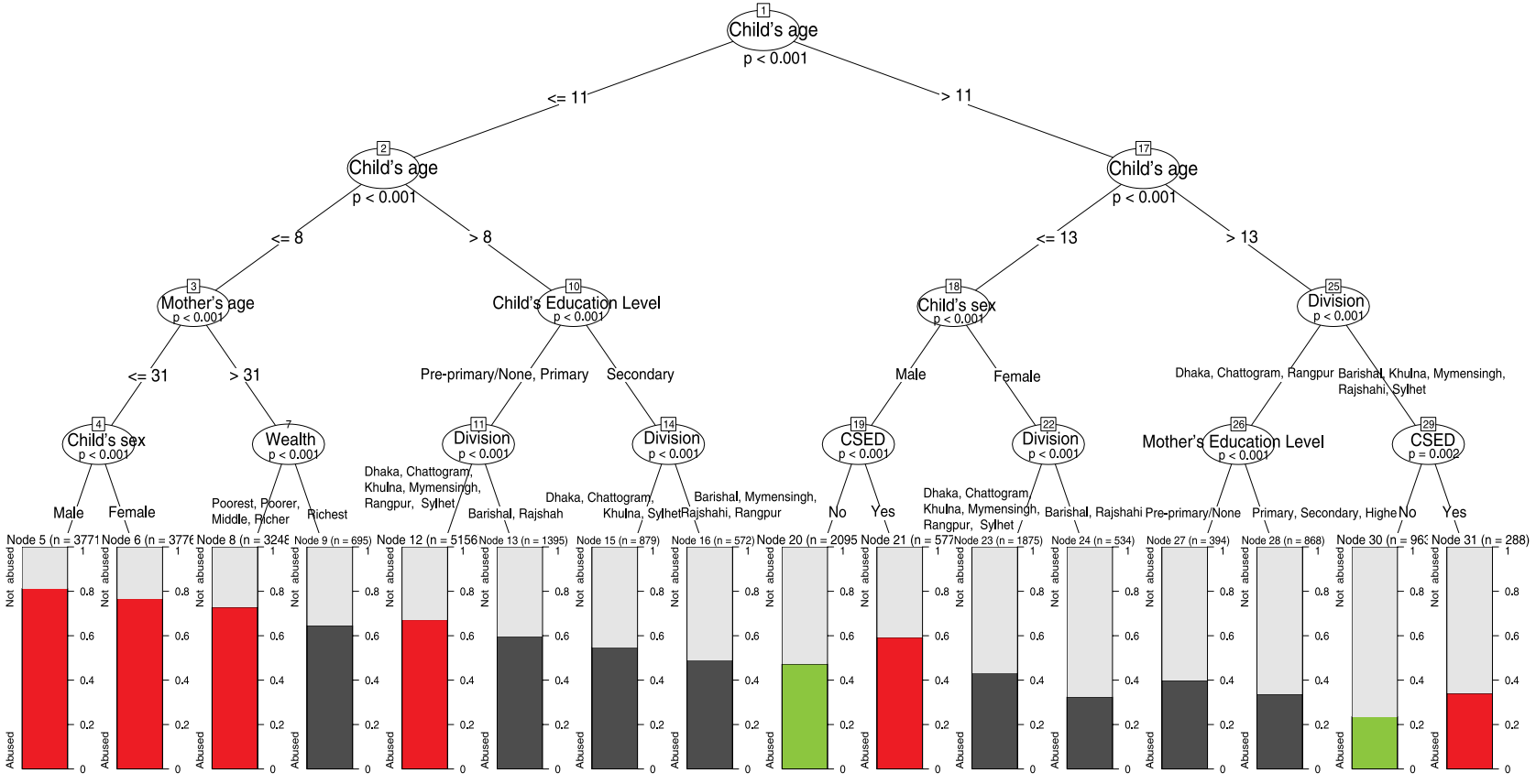

Fig. 2. Classification tree showing the sociodemographic risk profiles for children who experienced physical abuse at home.

1.08, 1.26) more likely to be a victim of physical abuse in comparison to children with mothers who did not justify such violent actions. Children's participation in household chores is also associated with 27 % higher odds of experiencing physical abuse (OR 1.27 with 95 % CI: 1.17, 1.37).

4.3. Classification tree

The classification tree in Fig. 2 revealed the variables that were the most important predictors of child abuse and these variables were also found significant at 0.5 % level of significance in the GLM. Notably, the age of a child was the most important predictor of abuse sitting at the top of the classification tree figure. Moreover, children's age was further broken down into two more branches on each side of the tree, showing that children aged 8 years or below were the most vulnerable to physical abuse (**node 5, 6, and 8**) with a considerably high prevalence of abuse ranging from 73 % to 81 %, in comparison to the overall prevalence of 62.5 %, which was considered as the threshold value for the proportion tests. On the other hand, children above the age of 13 had the minimum risk, specifically, those living in Barishal, Khulna, Mymensingh, Rajshahi, and Sylhet divisions who had no CSEDs (prevalence 23.7 %, p-value < 0.001) (**node 30**) (Table 3).

Clearly, the highest prevalence of physical abuse, more than 81 % (p-value < 0.001), was observed at the leftmost **node 5**, which consisted of male children aged 5–8 years, with mothers aged 31 or below. **Node-6** had the second highest prevalence at 76.7 % (p-value < 0.001), with the only difference that the children were females. This corroborated with the findings in the GLM confirming that young male children and children with younger mothers were at increased risk of physical abuse. Furthermore, children aged 9–11 years, studying below secondary level and residing in Dhaka, Chattogram, Khulna, Mymensingh, Rangpur or Sylhet divisions belonged to the significantly high-risk group for abuse as well (**node 12**).

In line with the specific interest of the current study, the tree shows that children with CSEDs had a significantly higher risk of experiencing physical abuse. According to **nodes 20** and **21**, male children aged 11–13 years, who had no CSEDs experienced a significantly lower (12 %) prevalence of abuse (47.2 %) than children who had CSEDs (59.3 %). Similar account was observed for **nodes 30** and **31** as well, where CSEDs increased the prevalence of abuse by more than 10 % in **node 31** (p-value <0.001).

4.4. Model validation

The generalized variance inflation factors (GVIFs) were assessed to check for the presence of multicollinearity in the model (Fox & Monette, 1992). The threshold value for the squared adjusted GVIFs for categorical variables is equivalent to the typical VIF threshold for continuous variables. Since all squared adjusted GVIFs were less than 5, thus we could conclude that there existed no multicollinearity in the model (Fox & Monette, 1992; Kutner et al., 2005). The detailed results can be found in the supplementary file (Supplementary Table 1).

5. Discussion

One of the main purposes of this study was to investigate whether children's cognitive and social-emotional difficulties (CSEDs) made them vulnerable to experiencing physical abuse. Moreover, whether mothers' support towards IPV had any considerable effect on the chances of their perpetration of physical abuse against children. Another purpose was to ascertain the key sociodemographic factors associated with child abuse. Lastly, the study aimed at identifying the specific groups of children who were at high risks of being

Table 3
Description of risk profiles of children for physical abuse obtained from the classification tree in Fig. 2.

Node	Description of the node	Percentage of physically abused children	Proportion test alternative hypothesis	Proportion test p-value
Node-5	Male children aged 8 years or below, having mothers aged 31 or below	81.3 %	Greater than threshold	<0.001
Node-6	Female children aged 8 years or below, having mothers aged 31 or below	76.7 %	Greater than threshold	<0.001
Node-8	Children aged 8 years or below, having mothers older than 31 years of age, living in Poorest, Poorer, Middle or Richer households	72.8 %	Greater than threshold	<0.001
Node-9	Children aged 8 years or below, having mothers older than 31 years of age, living in the Richest households	64.6 %	Greater than threshold	0.139
Node-12	Children aged between 8–11 years, with Primary or below education, living in any one of Dhaka, Chattogram, Khulna, Mymensingh, Rangpur or Sylhet divisions	67.2 %	Greater than threshold	<0.001
Node-20	Male children aged 11–13 years, who had no cognitive or social-emotional difficulties (CSEDs)	47.2 %	Less than node-21	<0.001
Node-21	Male children aged 11–13 years, who experienced cognitive or social-emotional difficulties (CSEDs)	59.3 %	Less than threshold	0.061
Node-30	Children aged 13–15 living in Barishal, Khulna, Mymensingh, Rajshahi, Sylhet divisions who did not experience cognitive or social-emotional difficulties (CSEDs)	23.7 %	Less than threshold	<0.001
Node-31	Children aged 13–15 living in Barishal, Khulna, Mymensingh, Rajshahi, Sylhet divisions who experienced cognitive or social-emotional difficulties (CSEDs)	34.0 %	Greater than node-30	<0.001

physically abused.

The analyses revealed that both CSEDs and mothers justifying IPV were associated with a considerably higher risk of child abuse. Furthermore, the sociodemographic variables, such as the age of mothers and their children, their respective educational levels, presence of siblings at home, household wealth status, residing area and particular divisions were significantly associated with physical abuse of the child in the GLM. Lastly, the classification tree revealed that male children aged 11 years or under with younger mothers were more likely to be abused and having CSEDs was associated with considerably higher chances of experiencing abuse in children across different risk profiles.

The evidence from the present analysis suggested that the age of a child was the most important variable for child abuse. Younger primary-school-going children were decidedly more likely to be abused. This corroborated with the findings in recent and past literature (Maden & Wrench, 1977; UNICEF, 2017). Children aged 11 years or below belonging to the highest-risk profiles emphasized the fact that interventions regarding eradicating physical abuse of children must target households with younger children. The underlying cause regarding the higher risk could be attributed to the fact that younger children stay at home more or have reduced school/work time compared to their older counterparts. The fact that younger children are more likely to experience difficulties with meeting parental expectations in their early formative years and be possibly more dependent on parents could also lead to physical abuse in the form of punitive disciplinary measures (UNICEF, 2017).

Children's experience with CSEDs is likely to impede psychological growth during their formative years (Crozier & Barth, 2005; Mills et al., 2011). Exposure to such challenges at a young age could force a child to act out in frustration and lose control over their emotional responses resulting in unsatisfactory academic performances and behavioral adjustments (Buckingham & Daniolos, 2013; Downey et al., 1998). The lack of recognition of children's CSEDs by the parents in low- and middle-income countries (LMICs) (Kieling et al., 2011) could eventually result in a mismatch between parental expectations and a child's behavioral and performance-related aspects, ultimately leading to physical abuse as a form of child-rearing.

The additional burden of abuse perpetrated by the younger mothers could be attributed to the high prevalence of early marriage of girls in Bangladesh and the existing association between lower education and younger mothers (Biswas, Khan, et al., 2019). Older mothers as well as mothers having beyond-secondary level education were less likely to perpetrate physical abuse on their children. It could be argued that younger and lowly educated mothers are most likely to be in their teenage and early twenties and the new and overwhelming responsibilities that come with marriage, such as, giving birth, taking care of children along with the husband and in-laws might render the younger mothers frustrated at times. Consequently, these frustrations along with the overwhelming pressure of responsibilities could lead to mothers taking out their misplaced anger in the form of physical abuse on their children.

The schooling of children and overall competitiveness is expectedly higher in urban areas than in rural settings. More schools and a higher number of students in the urban classrooms inevitably lead to increased competition among children and their parents alike. Thus, expectations are higher for the children to do well in schools which triggers parents to push their children for better career prospects from stronger academic performances, ultimately leading to abuse. With rural schooling quality still unsatisfactory albeit having increased enrollment (Asadullah & Chaudhury, 2013), the findings corroborate with this line of argument as the odds of abuse was nearly 20 % higher in urban households than in rural ones.

The general practice of physical abuse of the child within households in Bangladesh is considerably high due to the unsatisfactory performances in schools and behavioral delinquencies of the child that collides with the typical social norms. The presence of siblings at home between the ages of 5–17 years showed a higher risk of experiencing physical abuse by the child. Furthermore, living in the richest households was associated with lower odds of experiencing physical abuse. The interpersonal relationships among siblings, competition for resources in less wealthy households (Dietz, 2000), mothers' burden of caretaking multiple children along with other household responsibilities may compel the mothers to resort to physical violence to discipline their children.

This problem of overburdening the mother could be mitigated. Participation of other household members in these household and caretaking responsibilities could result in reduced instances of child abuse within households. Furthermore, households in Barishal, Khulna, Rajshahi, Rangpur and Mymensingh divisions showed much lower susceptibility towards physical abuse than in the Dhaka division where the competition for resources is expectedly much higher with a considerably denser population (Biswas, Kabir, et al., 2019). This further validates the argument of competition for resources being a vital cog in the sociodemographic mechanism of child abuse.

We hypothesized through the use of Browne's (1988) ecological model in the theoretical framework section that the culture of acceptance to violent behavior on part of mothers' relation to the father through justifying intimate partner violence (IPV) could also transfer to the acceptance and subsequent practice of violent abuse towards children (Assink et al., 2018; Little & Kantor, 2002). This idea was supported in the logistic regression model as a 16 % higher risk of experiencing physical abuse in children was associated with the acceptance or justification of IPV by the mothers. This was one of the important considerations in the present study that embodied the cultural aspect of violent behavior by the mothers according to the theoretical framework discussed in the study. Targeted interventions including awareness campaigns, maternal education and political goodwill could come to aid in eradicating this culture of justifying violence since such beliefs continue to be widespread in Bangladesh (Biswas et al., 2017).

Children's participation in household chores indicates the lack of helping hands the mothers have available to assist in carrying out their household responsibilities. Involvement in such activities comes at a cost of decreased playing/recreational hours for the children. Moreover, children might be unable to carry out the adult responsibilities appropriately while mothers without helping hands are more likely to be exasperated managing household responsibilities all by themselves. All of these could lead to mothers venting their frustrations out on their children through physical abuse.

The findings of this study are consistent in terms of the prevalence and socioeconomic determinants of abuse with existing research as evident from the multi-LMIC analysis by Beatriz and Salhi (2019). Another recent multi-country study, pertaining to 63 LMICs

including Bangladesh, on the early childhood developmental delay showed that children here are severely lagging in the domains of literacy and social-emotional development (Gil et al., 2020). This could be used to argue that this lack of development in these specific developmental domains is likely to be associated with children's experience of CSEDs later on, ultimately leading to higher abuse. This study pertains specifically to Bangladeshi families and holds important implications in the context of similar LMICs. Child disciplining in the form of physical punitive measures is considered a socially accepted practice in Bangladesh and even children are found to be justifying such practices (Atiqul et al., 2017; Uddin, 2013). Therefore the findings from this Bangladesh-focused analysis could be of academic importance to the researchers and policy-makers as well as all concerned stakeholders.

The study had a few limitations. First, since the national-scale dataset employed in the analysis of this paper is cross-sectional in nature, thus no causal relationship could be established among the variables. Second, the data on abuse is based on mothers' reporting of perpetrating the abuse themselves and no data from the children's perspective were available. Hence the aspects such abuse and the severity could not be established from both sides. Third, the data on children's cognitive and social-emotional difficulties were also based on responses from the mothers and not from the children's opinion, hence there could be some sort of recall and reporting bias associated with these variables even though these variables were found to perform with reliability and validity (Loeb et al., 2017). Finally, different kinds of abuse were collapsed to simplify the outcome (binary), whereas, in reality, the level of abuse could be somewhat varied. Moreover, mothers' possible underreporting of the CSEDs and exposure to physical abuses could present some issues.

Targeted intervention efforts on need-specific vulnerable groups of children can be quicker, more successful, and cost-effective in achieving the intended goal in comparison to a nationwide implementation of a more general policy, as evident from previous studies that discuss the efficacy of tailored-interventions (Ryan & Lauver, 2002; Tödtling & Trippl, 2005). The primary policy recommendation from this paper would be to devise interventions that would address the needs of younger children with cognitive and social-emotional difficulties (CSEDs) and provide additional support to aiding their development. These could be achieved by the utilization of mass media or the internet websites where educational programs addressing these issues could be operationalized with similar efforts gaining considerable success in Bangladesh in the past (Ashraf & Hoque, 2016). The second recommendation would be to target, particularly, the households with children younger than 11 years old, belonging to younger mothers of lower household wealth and residing in Dhaka, Chattogram and Sylhet divisions. In this case, public health campaigns providing focused key messages to the illiterate and underprivileged communities in developing countries using mass media (Cecchini et al., 2010; Wakefield et al., 2010) could be of particular importance in raising awareness regarding this issue of child maltreatment and be well within the financial reach of LMICs like Bangladesh.

6. Conclusion

The issue of violence against children at home is a widespread practice in the LMICs. Children physically abused within their households in the name of disciplining are at greater peril of facing developmental issues during childhood and adolescence with repercussions extending to adulthood. With children suffering from CSEDs facing a higher risk of violence, this paper brings light to the urgent need for swift actions from the government and all concerned parties to ensure the safety of the children. Although a paradigm shift is required regarding the identification of such abuse as a societal issue and devising subsequent corrective initiatives to uproot the problem entirely, yet, for LMICs like Bangladesh, it is imperative to devise interventions that could be achieved even with limited resources.

The period of childhood and adolescence is an enclosed window of development during which the surroundings of the child/adolescent strongly influence the intellectual growth and behavioral patterns (Lee et al., 2014). The aspects of interpersonal violence and child abuse will continue to be key issues to address in the near future for developing nations. It is crucial that Bangladesh make meaningful strides regarding these issues in order to meet the SDG 16.2 of eradicating all forms of violence against children.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Ethical clearance

This study was based on the analysis of a national-scale survey data from UNICEF, where all the personal identifiable information of participants had been removed. Informed consent was taken from participants before participating in the survey by the national statistical office, Bangladesh Bureau of Statistics and UNICEF. The datasets are available online at UNICEF MICS website: http://mics.unicef.org/surveys.

Authors' contribution

A Afiaz conceptualized the study, analyzed the data, drafted the manuscript, conducted literature review, revised and finalized the manuscript. **MS Masud** supervised the study, critically reviewed and revised the manuscript. **M Mansur** articulated the study design and critically reviewed and revised the manuscript. All authors read and approved the final manuscript.

Declaration of competing interest

There was no conflict of interest among the authors. All authors read the final manuscript and approved it.

Acknowledgments

The authors would like to acknowledge the United Nations Children's Fund (UNICEF) and Bangladesh Bureau of Statistics (BBS), who conducted the nationwide survey and made their data freely accessible.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.chiabu.2021.105028.

References

Afiaz, A., Biswas, R. K., Shamma, R., & Ananna, N. (2020). Intimate partner violence (IPV) with miscarriages, stillbirths and abortions: Identifying vulnerable households for women in Bangladesh. *PloS One, 15*(7), Article e0236670. https://doi.org/10.1371/journal.pone.0236670

Agresti, A., & Kateri, M. (2011). Lectures on categorical data analysis. *International encyclopedia of statistical science*. Berlin: Springer. https://doi.org/10.1007/978-3-642-04898-2_161

Akmatov, M. K. (2011). Child abuse in 28 developing and transitional countries-results from the multiple indicator cluster surveys. *International Journal of Epidemiology, 40*(1), 219–227. https://doi.org/10.1093/ije/dyq168

Ammerman, R. T., Van Hasselt, V. B., Hersen, M., McGonigle, J. J., & Lubetsky, M. J. (1989). Abuse and neglect in psychiatrically hospitalized multihandicapped children. *Child Abuse & Neglect, 13*(3), 335–343. https://doi.org/10.1016/0145-2134(89)90073-2

Asadullah, M. N., & Chaudhury, N. (2013). Primary schooling, student learning, and school quality in rural Bangladesh. *Center for Global Development Working Paper, 349*. https://doi.org/10.2139/ssrn.2375723

Ashraf, M., & Hoque, R. (2016). An illustration of information communication technology (ICT)-mediated innovation–adoption–implementation in rural Bangladesh. *Tékhne, 14*(1), 45–51. https://doi.org/10.1016/j.tekhne.2016.04.003

Assink, M., Spruit, A., Schuts, M., Lindauer, R., van der Put, C. E., & Stams, G. J. J. M. (2018). The intergenerational transmission of child maltreatment: A three-level meta-analysis. *Child Abuse & Neglect, 84*, 131–145. https://doi.org/10.1016/j.chiabu.2018.07.037

Atiqul, M. H., Janson, S., Moniruzzaman, S., Rahman, A. K. M. F., Mashreky, S. R., & Eriksson, U. B. (2017). Bangladeshi school-age children's experiences and perceptions on child maltreatment: A qualitative interview study. *Child: Care, Health and Development, 43*(6), 876–883. https://doi.org/10.1111/cch.12508

Bangladesh Bureau of Statistics (BBS), & UNICEF Bangladesh. (2019). *Progotir Pathey, Bangladesh Multiple Indicator Cluster Survey 2019*. Survey findings report. Dhaka, Bangladesh: Bangladesh Bureau of Statistics (BBS).

Beatriz, E., & Salhi, C. (2019). Child discipline in low- and middle-income countries: Socioeconomic disparities at the household- and country-level. *Child Abuse & Neglect, 94*, Article 104023. https://doi.org/10.1016/j.chiabu.2019.104023

Benedict, M. I., White, R. B., Wulff, L. M., & Hall, B. J. (1990). Reported maltreatment in children with multiple disabilities. *Child Abuse & Neglect, 14*, 207–217. https://doi.org/10.1016/0145-2134(90)90031-N

Benjamin, D. J., Berger, J. O., Johannesson, M., Nosek, B. A., Wagenmakers, E. J., Berk, R., Bollen, K. A., Brembs, B., Brown, L., Camerer, C., Cesarini, D., Chambers, C. D., Clyde, M., Cook, T. D., De Boeck, P., Dienes, Z., Dreber, A., Easwaran, K., Efferson, C., … Johnson, V. E. (2018). Redefine statistical significance. *Nature Human Behaviour, 2*(1), 6. https://doi.org/10.1038/s41562-017-0189-z

Biswas, R. K., Rahman, N., Kabir, E., & Raihan, F. (2017). Women's opinion on the justification of physical spousal violence: A quantitative approach to model the most vulnerable households in Bangladesh. *PloS One, 12*(11). https://doi.org/10.1371/journal.pone.0187884

Biswas, R. K., Kabir, E., & Khan, H. T. A. (2019). Causes of urban migration in Bangladesh: Evidence from the urban health survey. *Population Research and Policy Review, 38*(4), 593–614. https://doi.org/10.1007/s11113-019-09532-3

Biswas, R. K., Khan, J. R., & Kabir, E. (2019). Trend of child marriage in Bangladesh: A reflection on significant socioeconomic factors. *Children and Youth Services Review, 104*, Article 104382. https://doi.org/10.1016/j.childyouth.2019.06.017

Bremner, J. D. (2003). Long-term effects of childhood abuse on brain and neurobiology. *Child and adolescent psychiatric clinics of North America*. https://doi.org/10.1016/S1056-4993(02)00098-6

Browne, D. H. (1988). High risk infants and child maltreatment: Conceptual and research model for determining factors predictive of child maltreatment. *Early Child Development and Care, 31*(1–4), 43–53. https://doi.org/10.1080/0300443880310106

Buckingham, E. T., & Daniolos, P. (2013). Longitudinal outcomes for victims of child abuse. *Current Psychiatry Reports, 15*(2), 1–7. https://doi.org/10.1007/s11920-012-0342-3

Casanueva, C. E., & Martin, S. L. (2007). Intimate partner violence during pregnancy and mothers' child abuse potential. *Journal of Interpersonal Violence, 22*(5), 603–622. https://doi.org/10.1177/0886260506298836

Cecchini, M., Sassi, F., Lauer, J. A., Lee, Y. Y., Guajardo-Barron, V., & Chisholm, D. (2010). Tackling of unhealthy diets, physical inactivity, and obesity: Health effects and cost-effectiveness. *The Lancet, 376*(9754), 1775–1784. https://doi.org/10.1016/S0140-6736(10)61514-0

Crozier, J. C., & Barth, R. P. (2005). Cognitive and academic functioning in maltreated children. *Children and Schools, 27*(4), 197–206. https://doi.org/10.1093/cs/27.4.197

Dietz, T. L. (2000). Disciplining children: Characteristics associated with the use of corporal punishment. *Child Abuse & Neglect, 24*(12), 1529–1542. https://doi.org/10.1016/S0145-2134(00)00213-1

Downey, G., Lebolt, A., Rincón, C., & Freitas, A. L. (1998). Rejection sensitivity and children's interpersonal difficulties. *Child Development, 69*(4), 1074–1091. https://doi.org/10.1111/j.1467-8624.1998.tb06161.x

Fox, J., & Monette, G. (1992). Generalized collinearity diagnostics. *Journal of the American Statistical Association, 87*(417), 178–183. https://doi.org/10.1080/01621459.1992.10475190

Gagné, M. H., Tourigny, M., Joly, J., & Pouliot-Lapointe, J. (2007). Predictors of adult attitudes toward corporal punishment of children. *Journal of Interpersonal Violence, 22*(10), 1285–1304. https://doi.org/10.1177/0886260507304550

Gil, J. D. C., Ewerling, F., Ferreira, L. Z., & Barros, A. J. D. (2020). Early childhood suspected developmental delay in 63 low-and middle-income countries: Large within-and between-country inequalities documented using national health surveys. *Journal of Global Health, 10*(1). https://doi.org/10.7189/JOGH.10.010427

Golinkoff, D. G., Singer, R. M., & Hirsh-Pasek, K. (2006). *Play = Learning: How Play Motivates and Enhances Children's Cognitive and Social-Emotional Growth*. Oxford University Press.

Hamdani, S. U., Huma, Z.-E., Wissow, L., Rahman, A., & Gladstone, M. (2020). Measuring functional disability in children with developmental disorders in low-resource settings: Validation of Developmental Disorders-Children Disability Assessment Schedule (DD-CDAS) in rural Pakistan. *Global Mental Health, 7*, E17. https://doi.org/10.1017/gmh.2020.10

Hothorn, T., Hornik, K., & Zeileis, A. (2006). Unbiased recursive partitioning: A conditional inference framework. *Journal of Computational and Graphical Statistics, 15*(3), 651–674. https://doi.org/10.1198/106186006X133933

Hunt, J. M., & Paraskevopoulos, J. (1980). Children's psychological development as a function of the inaccuracy of their mothers' knowledge of their abilities. *The Journal of Genetic Psychology, 136*(2), 285–298. https://doi.org/10.1080/00221325.1980.10534123

International Labour Organization. (2013). Resolution I: Resolution concerning statistics of work, employment and labour under- utilization, adopted by the Nineteenth International Conference of Labour Statisticians, Oct. 2013. *International Conference of Labour Statisticians*.

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An introduction to statistical learning with applications in R. *Springer*. Springer.

Johnson, E. J., & James, C. (2016). Effects of child abuse and neglect on adult survivors. *Early Child Development and Care, 186*(11), 1836–1845. https://doi.org/10.1080/03004430.2015.1134522

Jones, L., Bellis, M. A., Wood, S., Hughes, K., McCoy, E., Eckley, L., … Officer, A. (2012). Prevalence and risk of violence against children with disabilities: A systematic review and meta-analysis of observational studies. *The Lancet, 380*(9845), 899–907. https://doi.org/10.1016/S0140-6736(12)60692-8

Kieling, C., Baker-Henningham, H., Belfer, M., Conti, G., Ertem, I., Omigbodun, O., Rohde, L. A., Srinath, S., Ulkuer, N., & Rahman, A. (2011). Child and adolescent mental health worldwide: Evidence for action. *The Lancet, 378*(9801), 1515–1525. https://doi.org/10.1016/S0140-6736(11)60827-1

Kutner, M., Nachtsheim, C., Neter, J., & Li, W. (2005). Applied statistical linear models. *McGraw Hill* (5th ed.).

Lee, F. S., Heimer, H., Giedd, J. N., Lein, E. S., Estan, N., Weinberger, D. R., & Casey, B. J. (2014). Adolescent mental health–Opportunity and obligation. *Science, 346*(6209), 547–549. https://doi.org/10.1126/science.1260497

Little, L., & Kantor, G. K. (2002). Using ecological theory to understand intimate partner violence and child maltreatment. *Journal of Community Health Nursing, 19*(3), 133–145. https://doi.org/10.1207/S15327655JCHN1903_02

Loeb, M., Cappa, C., Crialesi, R., & De Palma, E. (2017). Measuring child functioning: The UNICEF/Washington group module. *Salud Pública de México, 59*, 485–487.

Maden, M. F., & Wrench, D. F. (1977). Significant findings in child abuse research. *Victimology, 2*(2), 196–224.

Martin, A., Volkmar, F. R., & Lewis, M. (Eds.). (2007). *Lewis's child and adolescent psychiatry: A comprehensive textbook* (Fourth, pp. 692–741). Lippincott Williams and Wilkins.

McCullagh, P. (2018). *Generalized linear models*. Routledge.

MICS, & UNICEF. (2006). *Multiple Indicator cluster survey manual*. October.

Mills, R., Alati, R., O'Callaghan, M., Najman, J. M., Williams, G. M., Bor, W., & Strathearn, L. (2011). Child abuse and neglect and cognitive function at 14 years of age: Findings from a birth cohort. *Pediatrics, 127*(1), 4–10. https://doi.org/10.1542/peds.2009-3479

Moniruzzaman, S., Eriksson, U.-B., & Janson, S. (2016). 439 Perceptions and perspectives of child maltreatment in Bangladesh: A pilot study. *Injury Prevention, 22*(A160). https://doi.org/10.1136/injuryprev-2016-042156.439

Ofoha, D., & Ogidan, R. (2020). Punitive violence against children: A psychoeducational parenting program to reduce harsh disciplining practices and child beating in the home. *International Journal of Psychological Research, 13*(2), 89–98. https://doi.org/10.21500/20112084.4604

Perry, B. D., & Pollard, R. (1998). Homeostasis, stress, trauma and adaptation. A neurodevelepmental view of childhood trauma. *Child and Adolescent Psychiatric Clinics of North America, 7*(1). https://doi.org/10.1016/s1056-4993(18)30258-x

Rani, M., & Bonu, S. (2009). Attitudes toward wife beating: A cross-country study in Asia. *Journal of Interpersonal Violence, 24*(8), 1371–1397. https://doi.org/10.1177/0886260508322182

Read, J., Perry, B. D., Moskowitz, A., & Connolly, J. (2001). The contribution of early traumatic events to schizophrenia in some patients: A traumagenic neurodevelopmental model. *Psychiatry, 64*(4), 319–345. https://doi.org/10.1521/psyc.64.4.319.18602

Rikhy, S., Tough, S., Trute, B., Benzies, K., Kehler, H., & Johnston, D. W. (2010). Gauging knowledge of developmental milestones among Albertan adults: A cross-sectional survey. *BMC Public Health, 10*(1), 1–9. https://doi.org/10.1186/1471-2458-10-183

Ryan, P., & Lauver, D. R. (2002). The efficacy of tailored interventions. *Journal of Nursing Scholarship, 34*(4), 331–337. https://doi.org/10.1111/j.1547-5069.2002.00331.x

Sullivan, P., & Cork, P. (1996). *Developmental disabilities training project*. Omaha, NE: Center for Abused Children with Disabilities, Boys Town National Research Hospital, Nebraska Department of Health and Human Services.

Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse & Neglect, 24*(10), 1257–1273. https://doi.org/10.1016/S0145-2134(00)00190-3

Tödtling, F., & Trippl, M. (2005). One size fits all?: Towards a differentiated regional innovation policy approach. *Research Policy, 34*(8), 1203–1219. https://doi.org/10.1016/j.respol.2005.01.018

Tran, T. D., Nguyen, H., & Fisher, J. (2016). Attitudes towards intimate partner violence against women among women and men in 39 low- and middle-income countries. *PloS One, 11*, Article e0167438. https://doi.org/10.1371/journal.pone.0167438

Twentyman, C. T., & Plotkin, R. C. (1982). Unrealistic expectations of parents who maltreat their children: An educational deficit that pertains to child development. *Journal of Clinical Psychology, 38*(3), 497–503. https://doi.org/10.1002/1097-4679(198207)38:3<497::AID-JCLP2270380306>3.0.CO;2-X

Uddin, M. K. (2013). Relations among corporal punishment, perceived parental acceptance, and psychological adjustment of adolescents in Bangladesh. *Contemporary Social Scientist, 1*(5), 28–45.

UNICEF. (2017). A familiar face - Violence in the lives of children and adolescents. *United Nations children's fund*. https://doi.org/10.1111/j.1365-2044.1982.tb01804.x

UNICEF MICS. (2019). *MICS6 TOOLS. Home - UNICEF MICS*. http://mics.unicef.org/tools#survey-design.

United Nations. (2009). World report on violence against children. *World report on violence against children*. https://doi.org/10.1143/Jpsj.76.114801

United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations sustainable knowledge platform. *Sustainable development goals*. https://sustainabledevelopment.un.org/post2015/transformingourworld.

Wakefield, M. A., Loken, B., & Hornik, R. C. (2010). Use of mass media campaigns to change health behaviour. *The Lancet, 376*(9748), 1261–1271. https://doi.org/10.1016/S0140-6736(10)60809-4

Yount, K. M., VanderEnde, K., Zureick-Brown, S., Anh, H. T., Schuler, S. R., & Minh, T. H. (2014). Measuring attitudes about intimate partner violence against women: The ATT-IPV scale. *Demography, 51*(4), 1551–1572. https://doi.org/10.1007/s13524-014-0297-6

Zielinski, D. S. (2009). Child maltreatment and adult socioeconomic well-being. *Child Abuse & Neglect, 33*(10), 666–678. https://doi.org/10.1016/j.chiabu.2009.09.001