

Longitudinal Association Between Parental-to-child-maltreatment and Self-reported Generalized Anxiety Disorder Symptoms in Pakistani Adolescents

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Research article

Keywords: Mental health, Generalized Anxiety Disorder (GAD), maltreated children, GAD symptoms

Posted Date: March 6th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-272642/v1>

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Version of Record: A version of this preprint was published at Child and Adolescent Psychiatry and Mental Health on July 14th, 2021. See the published version at <https://doi.org/10.1186/s13034-021->

00387-1.

Abstract

Background: Parent-to-child maltreatment is considered to be one of the risk factors for Generalized Anxiety Disorder (GAD) symptoms but this hypothesis has not been adequately tested in Pakistani settings.

Aim: This study aimed to examine the association between parent-to-child maltreatment and the risk of developing GAD symptoms among adolescents.

Methods: The association of none to rare, occasionally and frequently parent-to-child maltreatment with the incidence of GAD symptoms was investigated in a sample of 800 adolescents aged 11-17 years who were followed for a period of 2 years. Parent-to-child maltreatment was assessed using ICAST-C (International child abuse screening tool) whereas GAD Symptoms was determined by SCARED (Screen for children anxiety related disorders). Cox Proportional Algorithm was used to estimate risk ratios.

Results: Forty-two percent of frequently maltreated children developed GAD symptoms compared to nine percent of none to rare maltreated children. Among children with both uneducated parents, frequently maltreatment was associated with 7.31 (2.20-24.04) times the risk of GAD symptoms as compared to none to rare maltreatment.

Conclusion: The frequency of parent-to-child maltreatment is significantly associated with an increased risk of development of GAD symptoms in which parental education plays a crucial role, hence evaluation for the GAD symptoms should be a priority for adolescents with history of occasionally to frequently parent-to-child maltreatment. Parents should be imparted aware about the ultimate consequences of child maltreatment.

Introduction

Mental health disorders constitute 16% of the global burden of disease and injury in adolescents (WHO, 2019). Statistics depict that each year one out of every five adolescents, start experiencing at least one form of mental illness (WHO, 2017). Individuals in the adolescence phase are emotionally, physically, socially and mentally vulnerable as it is a very crucial phase due to the initiation of transition from childhood to adulthood. This vulnerability leads to the development of many mental illnesses that might persist in adulthood ultimately affecting the overall health-related quality of life of an individual (UNICEF, 2019). The most common mental illnesses encountered by adolescents include anxiety disorder (mainly generalized anxiety disorder), depression, attention deficit disorders, conduct and eating disorders (Michaud & Fombonne, 2005).

Generalized anxiety disorder (GAD), defined as “excessive anxiety and worry, occurring more days than not for at least 6 months, about a number of events or activities”, is a type of anxiety disorder that is characterized by continuous worry and anxiety along with several other symptoms like restlessness, functional impairment, sleep disturbance, gastrointestinal symptoms, chronic headaches and muscular

cramps (Association., 2013). Symptoms of GAD is fairly common and impairing condition in adolescents with a lifetime prevalence of 3% globally. If the time period is restricted to 3 months than the prevalence increases to 5% worldwide (Gale & Millichamp, 2016).

Estimates of GAD based on symptomatology and may vary worldwide; the reported prevalence of GAD in adolescents in the USA lies between 3-9% whereas in the United Kingdom it is 0.7% (Green, McGinnity, Meltzer, Ford, & Goodman, 2005). Danish children and adolescents have a prevalence of 1.5% of symptoms related to GAD (Esbjörn, Hoeyer, Dyrborg, Leth, & Kendall, 2010) while Nigerian adolescents have a 3.5% of overall burden of GAD symptoms (Adewuya, Ola, & Adewumi, 2007). Regionally quite a few studies depicted the burden of GAD related symptoms in children and adolescents. A study conducted in Urban India reported a 20.9% occurrence of GAD related symptoms in children and adolescents (Jayashree, Mithra, Nair, Unnikrishnan, & Pai, 2018) whereas Iran reported a 0.54-20.18% burden among adolescents (Zarafshan, Mohammadi, & Salmanian, 2015). Chinese school going adolescents have a reported burden of 1.77% (Shen et al., 2018). This vast range of prevalence reported by many studies might be due to the different cultural settings, different predefined diagnostic thresholds, availability of different tools to assess GAD based on symptomatology or due to underreporting of symptoms because of the fear of stigmatization (Burstein, Beesdo-Baum, He, & Merikangas, 2014).

In Pakistani settings, there were very limited studies which exhibited a definite burden of GAD related symptoms in adolescent population. One study conducted in Lahore, Pakistan indicated that 52% of adolescents have at least one symptom of GAD whereas approximately 8% of adolescents have more than 4 GAD persistent symptoms (Afzal, Sarfraz, & Hassan, 2014).

Previous literature has highlighted multiple risk factors and predictors which could lead to the development of symptoms of GAD in adolescents. The most common factors includes parent-to-child conflicts, parent-child relationship, parental control, hormonal changes that occur during adolescence, genetic predisposition, stress, family conflicts, communication gap with parents, traumatic life experiences, academic stresses, physical changes, socioeconomic burden, conflicts in friendships and interpersonal relationships, succumbing to parental pressure, cultural norms and religious obligations (Afzal et al., 2014; Brown, Chorpita, & Barlow, 1998; Newman, Shin, & Zellig, 2016; Wittchen, 2002). Moreover age was also indicated as one of the prime risk factors of increasing risk of GAD symptoms, early adolescence was linked to a greater risk as compared to late adolescence (Carter, Silverman, & Jaccard, 2011). Among all these significant risk factors, traumatic childhood experience due to parent-to-child maltreatment of any sort including physical, emotional, mental as well as neglect, was found to be one of the most reported risk factor leading to occurrence of GAD symptoms (Safren, Gershuny, Marzol, Otto, & Pollack, 2002). Adults who experience any variant of parent-to-child mistreatment, the burden is reported to be 30 – 40 % , with up to 30% of all maltreated children fulfilling DSM-IV criteria for psychological morbidity in their late 20s (Dannowski et al., 2012). Statistics reveal that every year, about 4–16% of children are maltreated by parents and one in ten is neglected or psychologically mistreated (Gilbert et al., 2009). 13% is the reported prevalence of parent-to-child maltreatment in developing countries (Kim, Wildeman, Jonson-Reid, & Drake, 2017; Runyan, 2018). According to a previous study,

43% of children in Pakistan self-reported parent-to-child maltreatment and amongst these, 57% were neglected, 49% were physically maltreated and 50% suffered from emotional maltreatment (M. Lakhdir et al., 2016). Another study indicated a 25.5% of physical abuse and a 17.9% of emotional abuse by parents among Pakistani Children (Ali & Khuwaja, 2014). Literature indicated that continuous and frequent exposure to child maltreatment interrupts hypothalamic pituitary adrenal axis functioning and leads to neurobiochemical changes in brain including an increase in thalamic grey matter volumes of subcortical region of the brain which can result in development of GAD symptoms (Calhoun, Ridenour, & Fishbein, 2019; Liao et al., 2013). Moreover, constant maltreatment by parents can disrupt the safety blanket of an adolescent resulting in various fears, apprehensions, cognitive deficit and emotional vulnerability which could lead to anxiety disorders (Berzenski, Madden, & Yates, 2019).

GAD and related symptoms has major public health implications predominantly in adolescents. It is considered as a prodrome of chronic depression (Masi, Favilla, Mucci, & Millepiedi, 2000). Moreover, it is also considered as the route to the development of sleep disorders, eating disorders and other psychological comorbidities (Varchol & Cooper, 2009). The long term effect of GAD symptoms personally, socially and economically is quite damaging and therefore needs to be addressed especially in developing population where reporting mental illness is still considered as a stigma. Given the escalating burden of anxiety disorders in adolescents, it is the need of the hour to identify the predictors associated with GAD symptoms so that it can be addressed and treated accordingly. Furthermore, in Pakistani cultural settings where harsh disciplinary measures are considered as a norm (M. Lakhdir et al., 2016; M. P. A. Lakhdir et al., 2017), parent-to-child maltreatment is extremely prevalent and may lead to various anxiety disorders including GAD. Adolescents constitute a large chunk of the Pakistani population and their psychosocial issues must be adequately and timely catered to prevent further detrimental consequences. There is a wide gap in research that identifies the potential risk factors including parent-to-child maltreatment which leads to the development of anxiety disorders in adolescents in our settings. Furthermore, the definite burden of GAD symptoms and its association with parent-to-child maltreatment in adolescents is also not yet established in our settings. Thus the aim of this study is to determine the occurrence of GAD symptoms in association with parent-to-child maltreatment and other risk factors among adolescents aged 11-17-year-old in Karachi, Pakistan.

Methodology

Study Design

A prospective cohort study was conducted to determine the occurrence of GAD symptoms in adolescents aged 11-17 years in community settings of Karachi, Pakistan. This study was conducted in continuation of a cross-sectional survey which aimed to determine the burden of parent-to-child maltreatment in 800 adolescents residing in 32 random clusters of Karachi Pakistan in 2015 (M. Lakhdir et al., 2016; M. P. A. Lakhdir et al., 2017). The parent-to-child maltreatment status of adolescents was post hoc categorized into 3 categories based on frequency namely none to rare, occasional and frequent child maltreatment. Adolescents recruited for the primary study were screened for presence of existing psychiatric disorder,

individuals with any such disorder were excluded from the primary study. The frequency of parent-to-child maltreatment was considered as a primary exposure for this cohort study. All adolescents under each category of primary exposure were followed for two years till 2017 for the development of GAD symptoms.

Study Setting and sampling strategy:

A multistage cluster sampling was adopted and 32 urban and peri-urban areas (clusters) of Karachi, Pakistan were systemically selected that were considered as primary sampling unit. The Federal Bureau of Statistics has divided Karachi urban and peri-urban areas into about 7750 clusters of 125 – 350 households that's make 18 town in all. The sampling frame was available for 15 towns comprising of 80 random clusters and each clusters has minimum of 125households. We targeted one third of all house hold per cluster that is 25 households per cluster. Out of 80 clusters, we randomly selected 32 clusters through systematic random sampling by calculating cluster size, so to have clusters from each town, which was result in diverse group of culture and socioeconomic status. Twenty five (25) households was selected from each of these 32 clusters through systematic random sampling. Selection of household was based on presence of at least one child in that household. A total of 800 households (secondary sampling unit) were systematically selected from primary sampling unit. From each household an eligible adolescent (tertiary sampling unit) was selected randomly; were examined for the occurrence of GAD symptoms. Only one child from each household was recruited in the study. Referring to first sampled household within clusters, In case, if house was found to be locked then that house was re-visited for maximum two times on a very same day after that we excluded that house from the sample and replaced it by another household to complete the sample size. If residents were present, the next step was to look whether there was a child among residents or not. In case, child was present among residents, next step was to look for eligible child according to eligibility criteria. In case, there was an eligible child among resident but was not present at that point in time, the household was revisited for maximum two times on a very same day after that we excluded that house from the sample. In the presence of two or more eligible children in a household, balloting (simple random sampling) was done to select one of them. After followup of 2 years, the retention rate was 93.8% (n= 751) out of total participants.

Study Population:

All children, male and female, aged between 11-17 years that were a part of the primary study were followed for 2 years. The eligibility criteria for inclusion of participants necessitates that those children who lived at home with at least one biological parent and would continue residing in Karachi in that particular area for a minimum of the study period should be included. Moreover, the presence of adolescents willingness to give oral assent and written consent were a prerequisite for inclusion in the study. Children with known severe physical or mental disabilities or chronic severe illnesses and psychiatric disorders were excluded from the study.

Follow-up Sample: The total sample size in the primary study consisted of 800 adolescents(M. P. A. Lakhdar et al., 2017). Final analysis of this study was carried on 751 (93.8%) adolescents as 49

participants were loss to follow up. The reasons of loss to follow up alongwith the distribution of participants as per the status of primary exposure are elaborated in **Figure 1**.

Study Variable

Dependant variable:

GAD symptoms were measured with Screen for Child Anxiety Related Disorders (SCARED) tool. This is a validated tool based on symptomatology, comprising of 5 domains with 41 items rated on a 3-points Likert scale starting from 0 to 2. point 0 indicates 'not truly and hardly even true', 1 indicates 'somewhat truly or somewhat true' and 2 indicates 'very true or very often'. This tool has also been used previously in our settings as well as has also been field tested regionally(Joshi et al., 2013). One of the domain of SCARED tool is on symptoms of GAD, a score of 9 or more on item numbers 5, 7, 14, 21 23,28, 33, 35 and 37 indicates the presence of GAD symptoms and it was considered as a binary variable. This GAD symptoms subscale of this tool is deemed reliable with reported Cronbach alpha of 0.87 (Jastrowski Mano et al., 2012)

Independent variables:

Primary exposure:

Parent-to-child maltreatment status in the primary study was assessed by the International child abuse screening tool for child (ICAST-C) which was adopted from International Society for the prevention of child abuse and neglect. This is a validated self-reported tool comprising of 30 items rated on a 4 point Likert scale stratin from 1=never to 4= many times. Three items in this scale had scores in descending order, whereas rest were in ascending order. This tool is deemed reliable with the cronbach alpha of 0.72-0.855(Zolotor et al., 2009). The primary exposure was categorized into 3 categories based on frequncy of maltretament to child as none to rare (n=479), occasional (n=243) and frequent maltreatment (n=78). This tool covers physical victimization, psychological victimization and neglect by parents to child. Sexual victimization from parents to child was excluded from primary study due to cultural restrictions.

Other Covariates:

Association of various covariates including age, gender, type of family system, presence of physical, verbal and sibling abuse in family, parental use of substance abuse, intergenerational abuse, history of parents psychiatric illness, history of maternal domestic violence, BMI, socioeconomic status, stress at home perceived by parents, parental employment and education status, child education status and birth order with occurance of GAD symptoms was assessed.

Data Collection and Management Methods:

Face to face interviews were conducted by trained psychologists, using a structured questionnaire. Principal investigator along with field supervisor edited the filed questionnaire daily after the data

collection has been done to ensure that there are no missing values, no illogical or inappropriate entries, completeness and accuracy of data. For missing values or inappropriate information principal investigator again contacted the participant for correction and verification. Spot checks were done by the principal investigator by again administering the questionnaire to the same participant to account for inaccuracies. Every effort was done to ensure the completeness of data. Moreover before initiating with data entry, another thorough checking was done to ensure accuracy and completeness of data. Once the editing was done, filled questionnaires were secured in a locked cabinet. All the participants were allotted unique ID number to ensure anonymity and confidentiality. Ethical approval was taken from The Aga Khan University Ethical Review Committee (4816-CHS-ERC-17). To respect the autonomy of each participant, verbal assent and written consent was obtained.

Data Analysis:

Data was entered in Microsoft Access (2007 – 2010) and analyzed using STATA version 15. All normally distributed continuous variables were summarized with their mean and standard deviation. For categorical variables, frequency counts and percentages were reported. Crude and adjusted risk ratios along with 95% CI were reported using Cox proportional Algorithm, adjusted for multistage cluster random sampling technique..

Results

A total of 800 adolescents were recruited in the primary study, out of which 49 (6.12%) were loss to follow up. Number of participants who were loss to follow up from each level of exposure along with reasons of loss to follow up are given in **figure 1**.

The baseline characteristics of the participants as per the frequency of childhood maltreatment are displayed in **table 1**. The mean age of children in this study was 13.13(1.84) years. There was no difference in mean age among all levels of exposure. Among occasional to frequent maltreated children, 144(62%) and 47(64%) were males, suggesting that males are more likely to suffer from parent-to-child maltreatment. Occasionally, 123 (53%) and frequently maltreated children 46 (63%) were also more likely to be the middle child of the family.

Certain familial characteristics were associated with severe childhood maltreatment. These characteristics include belonging to extended family (41%), presence of physical (39.73%), verbal (84.93%) and sibling abuse within family (84.93), maternal history of domestic violence (45.21), parental use of substance abuse (44%) and stressful home environment(60.27%).

The occurrence of none to rare, occasional and frequent parent-to-child maltreatment in the given sample of 751 adolescents is 59%(n=446), 31%(n=232) and 10%(n=73) respectively. The occurrence of GAD symptoms after 2 years of follow-up among frequently maltreated children is 42.5%(n=31), whereas among occasionally maltreated and none to rare-maltreated children it is 15.1%(n=35) and 9.5%(n=42).

Multivariable analysis using Multiple Cox proportional algorithm, the association between GAD symptoms with parent-to-child mistreatment and other predictors, is given in **Table 2**. The standardized risk of GAD symptoms was increased by 2 fold in females as compared to males (RR: 2.22 CI:1.56-3.15). Likewise, children with a maternal history of domestic violence had 1.34 times greater risk of developing GAD symptoms as compared to those children with no history of maternal domestic violence (RR: 1.34 CI: 0.98-1.83) adjusted for other variables. A significant interaction between parental education status and frequency of parent-to-child maltreatment suggest that children with either uneducated parent, the risk of GAD symptoms was 5.58 times (CI: 1.40-21.97) among frequently maltreated as compared to none to rare maltreated children. Whereas children whose both mother and father had no formal education, exposure to frequent childhood maltreatment by parents was associated with an 7 fold increase in risk (CI: 2.20-24.04) of developing symptoms of GAD as compared to none to rare exposure to parent-to-child maltreatment (**Figure 2**).

Discussion

Childhood maltreatment was recognized as one of the potential risk factors as an increasing trend was reported between incidence of self-reported generalized anxiety disorder (GAD) symptoms and the parent-to-child maltreatment. A total of 14.8% of adolescents developed GAD symptoms, among which severely maltreated adolescents had comparatively higher risk than mild and moderately maltreated adolescents. Previous literature reported almost half of the incidence of GAD symptoms in maltreated adolescents as compared to our study (Safren et al., 2002). The probable reason for this difference could be different harsh disciplinary measures adopted by parents in Pakistani culture. According to previous data multiple variants of childhood maltreatment including physical abuse, (Cogle, Timpano, Sachs-Ericsson, Keough, & Riccardi, 2010), emotional traumatization (McLaughlin, Peverill, Gold, Alves, & Sheridan, 2015), sibling victimization and bullying (Bowes, Wolke, Joinson, Lereya, & Lewis, 2014) are associated with the development of GAD symptoms in children and adolescents. The results of the present study depicted similar associated predictors of GAD.

One of the findings of our study indicated that gender has a significant role to play in the occurrence of GAD symptoms. The risk of GAD symptoms was found to be increased in females as compared to males. Various studies showed agreement with this finding indicating that anxiety disorders especially GAD is associated with a greater burden in females as compared to males (Bahrami & Yousefi, 2011; Vesga-López et al., 2008). The likely reason for this association could be a higher tendency of females to worry and ruminate (Shear, 1997). Moreover, their genetic makeup and hormonal changes during ovulation and menstruation could be other possible reason which makes female more vulnerable to anxiety disorder (Pujol et al., 2002; Shear, 1997). In comparasion, males tend to have lesser tendency to develop GAD symptoms due to cultural norms that promote greater stoicism and less expressiveness which leads to less endorsement and acceptance of anxiety symptoms. Moreover, it is considered socially acceptable for females to express fear and anxiety but not for males who are expected to put up a brave front everytime (Vesga-López et al., 2008).

It was evident from this study that the history of maternal domestic violence was another factor that seemingly played an important role in the development of GAD symptoms in adolescents. This finding was consistent with previously reported literature which demonstrated that interparental violence specifically maternal violence increases the vulnerability of children and adolescents to develop symptoms of GAD (Moffitt et al., 2007; Pelcovitz, Kaplan, DeRosa, Mandel, & Salzinger, 2000). Void of a protective shield by parents and family which helps in neutralizing stresses of adolescents is affected by interparental violence, which might be the reason that exposure to maternal violence is a significant predictor of GAD symptoms (Pelcovitz et al., 2000).

The results also revealed that the occurrence of GAD symptoms was higher among moderately or severely maltreated adolescents whose parents had no formal schooling. Certain studies have previously shown agreement with this interaction, suggesting that child abuse is significantly associated with parental education in causing anxiety disorders especially GAD (Leung, Wong, Chen, & Tang, 2008; MacMillan et al., 2001). It was also reported that parent-to-child maltreatment is common among adolescents who have fathers with lower education levels or no education. One plausible explanation for this interaction is that uneducated parents expect their children to do well for the family economically to raise the standard of living, hence they impose harsh disciplinary measures and resort to physical and emotional abuse, leading to development of GAD symptoms in adolescents (Leung et al., 2008). Moreover, lack of adequate parenting skills, anger management and adequate communication skills in uneducated parents might be the reason of practicing punitive disciplinary practices (M. P. A. Lakhdar et al., 2017) that could lead to anxiety disorders in adolescents. Moreover, lack of adequate education results in dearth of knowledge, skills and competence which are essential for understanding adolescents cognitive functioning as well as meeting their safety, developmental and other necessary needs which may contribute to parent-to-child maltreatment (Khosravan, Sajjadi, Moshari, & Barzegar Shoorab Sofla, 2018).

One of the major strengths of this study is the sufficient sample size with negligible loss to followup warranting robustness of study and no sparsity of data. Adequate follow-up period of 2 years to ensure sufficient time for the development of outcome as well as the rigor of a prospective cohort study design to establish temporality and causality are the most prominent strengths of this study. Moreover, a multicluster approach to cater target population from diverse backgrounds to ensure generalizability/ external validity of the study is another factor that adds to the vigor of the study. There are few limitations in this study which include that certain potential risk factors and predictors of GAD based on symptoms as reported by literature like socioeconomic status, intergenerational abuse, history of parents' psychiatric illness etc were insignificant in this study. Moreover few variables of this study did not have any definite definition and were conceptualized and assessed, based on operational definitions. The subjectivity of the outcome and primary exposure was another limitation of this study.

Conclusion

The findings of this study evidenced that the frequency of parent-to-child maltreatment is significantly associated with an increased risk of development of GAD symptoms in which parental education plays a

crucial role, hence . intervention strategies should be designed to educate and enlighten uneducated and unaware parents regarding consequences of parent-to-child maltreatment . The findings in the literature are extremely consistent with this notion and emphasizes the need for development and implementation of policies and strict measures to ensure that such practices are condemned and inhibited. The results of this study also indicated that girls are more vulnerable to develop GAD symptoms, hence adequate emotional support, timely treatment and counseling should be provided to them to prevent long term adverse consequences. Moreover the findings of this study also emphasize that children who witness maternal domestic violence are more prone to develop symptoms of GAD, hence safe home environment should be ensured. The results also indicate that evaluation for the GAD symptoms should be a priority for adolescents with history of moderate to severe maltreatment. Moreover it also emphasizes the need for clinicians and mental health workers to be aware of childhood maltreatment histories of patients presenting with GAD symptoms so that it can be appropriately addressed and treated.

Declarations

Ethics approval and consent to participate: Ethical approval was taken from The Aga Khan University Ethical Review Committee (4816-CHS-ERC-17). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional committee.

Informed consent: Before data collection, the parents of all adolescents wishing to participate were asked to sign a written form of consent for their children to be included. The children of non-consenting parents did not participate in data collection. Informed assent was also obtained from all individual participants under age of 18 years included in the study.

Consent for publication:

The authors consent for publication of this paper. All authors have read and approved the final manuscript. This manuscript has not been published and is not under consideration for publication elsewhere.

Availability of data and materials: The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to information that could compromise the privacy of research participants.

Competing interests: The authors declare that they have no competing interests. The authors report no conflict of interest.

Funding: This study was funded from the FHS Research Committee, Aga Khan University, Pakistan [grant number PF99/0417)]

The content is solely the responsibility of the authors and the funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. The content is exclusively the accountability of the author and does not signify the authorized views of the funding organization.

Authors' contributions: Conception or design of the work: MPL, NA, AK; Data collection: MPL, AA, SF; Data analysis and interpretation: MPL, GP, SMS, SIA; Drafting the article: GP, SMS; Critical revision of the article: MPL, NA, SF; Final approval of the version to be published: MPL, GP, SMS, AA, SF, NA, SIA. All authors read and approved the final manuscript.

Acknowledgements: Special thanks to Shukrat Khan, Shahida Muzaffar, Tooba Naseem and Rutaba Khan for their participation in the process of data collection.

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Tables

Table 1: Baseline characteristics of key indicators of participants by frequency of parent-to-child maltreatment

Baseline Characteristics	Total N=751	None to rare parent- to-child maltreatment 446(59%)	Occasional parent-to- child maltreatment 232(31%)	Frequent parent-to- child maltreatment 73(10%)
Age*	13.13(1.84)*	13.29(0.09)*	12.90(0.11)*	12.84(0.21)*
Gender				
• Male	397(52.86)	206(46.19)	144(62)	47(64.38)
• Female	354(47.14)	240(53.81)	88(37.93)	26(35.62)
Extended Family System	325(43.38)	184(41.26)	111(47.84)	30(41.10)
Physical abuse within family	117(15.58)	40(8.97)	48(20.69)	29(39.73)
Verbal abuse/ quarrel within family	425(56.59)	206(46.19)	157(67.67)	62(84.93)
Bullying and mistreating by siblings	376(50)	162(36.32)	152(65.52)	62(84.93)
Overweight/obese	195(26)	137(30.72)	44(18.97)	14(19.18)
Total Family members*	8.74(4.84)*	8.23(0.20)*	9.07(0.32)*	10.78(0.81)*
Parental use of substance abuse	246(32.76)	126(28.75)	88(37.93)	32(44)
Intergenerational abuse	367(48.87)	242(54.26)	94(40.42)	31(42.27)
History of parental psychiatric illness	192(25.57)	103(23.09)	63(27.16)	26(35.62)
Stress home environment perceived by parents	287(38.22)	148(33.18)	95(40.95)	44(60.27)
Not satisfied by family life	658(87.62)	402(90.13)	200(86.21)	56(76.71)
No familial support	655(87.22)	391(87.67)	203(87.50)	61(83.56)
Birth order				
• First child	246(32.76)	167(37.44)	64(27.59)	15(20.55)
• Middle child	342(45.54)	173(38.79)	123(53.02)	46(63)
• Last child	163(21.70)	106(23.77)	45(19.40)	12(16.44)
Maternal History of domestic violence	244(32.49)	118(26.46)	93(40.09)	33(45.21)
Maternal employment	654(87.32)	381(85.81)	209(90.09)	64(87.67)

status (housewife)				
Paternal employment status (unemployed)	35 (5%)	17(4.16)	12(5.45)	6(8.45)
Parental education status				
• Both parents are educated	105(13.98)	51(11.43)	30(12.93)	24(32.88)
• Either parent is uneducated	220(29.29)	122(27.35)	77(33.19)	21(28.77)
• Both parents are not educated	426(56.72)	273(61.21)	125(53.88)	28(38.36)
Child education status (No formal education)	45(5.99)	18(4.04)	15(6.47)	12(16.44)
Socioeconomic status (composite wealth index)				
• Low	100(13.32)	55(12.33)	31(13.36)	14(19.18)
• Middle	542(72.17)	310(69.51)	179(77.16)	53(72.60)
• High	109(14.51)	81(18.16)	22(9.48)	6(8.22)

(* Means (Standard Deviation))

Table 2: Adjusted risk ratio with 95% Confidence interval for covariates associated with GAD symptoms in adolescents in Karachi, Pakistan

Characteristics	Adjusted Risk Ratio	95% CI
Gender (Female)	2.22	1.56 3.15
History of Maternal domestic violence	1.34	0.98 1.83
Parental education status and child maltreatment\		
Both parents with formal education		
• None to rare parent-to-child maltreatment	-	-
• Occasional parent-to-child maltreatment	0.52	0.16 1.61
• Frequent parent-to-child maltreatment	1.89	0.89 4.31
Either parent with no formal education		
• None to rare parent-to-child maltreatment	-	-
• Occasional parent-to-child maltreatment	2.66	1.19 5.81
• Frequent parent-to-child maltreatment	5.58	1.41 21.97
Both parents with no formal education		
• None to rare parent-to-child maltreatment	-	-
• Occasional parent-to-child maltreatment	1.71	1.09 2.63
• Frequent parent-to-child maltreatment	7.31	2.20 24.04

Figures

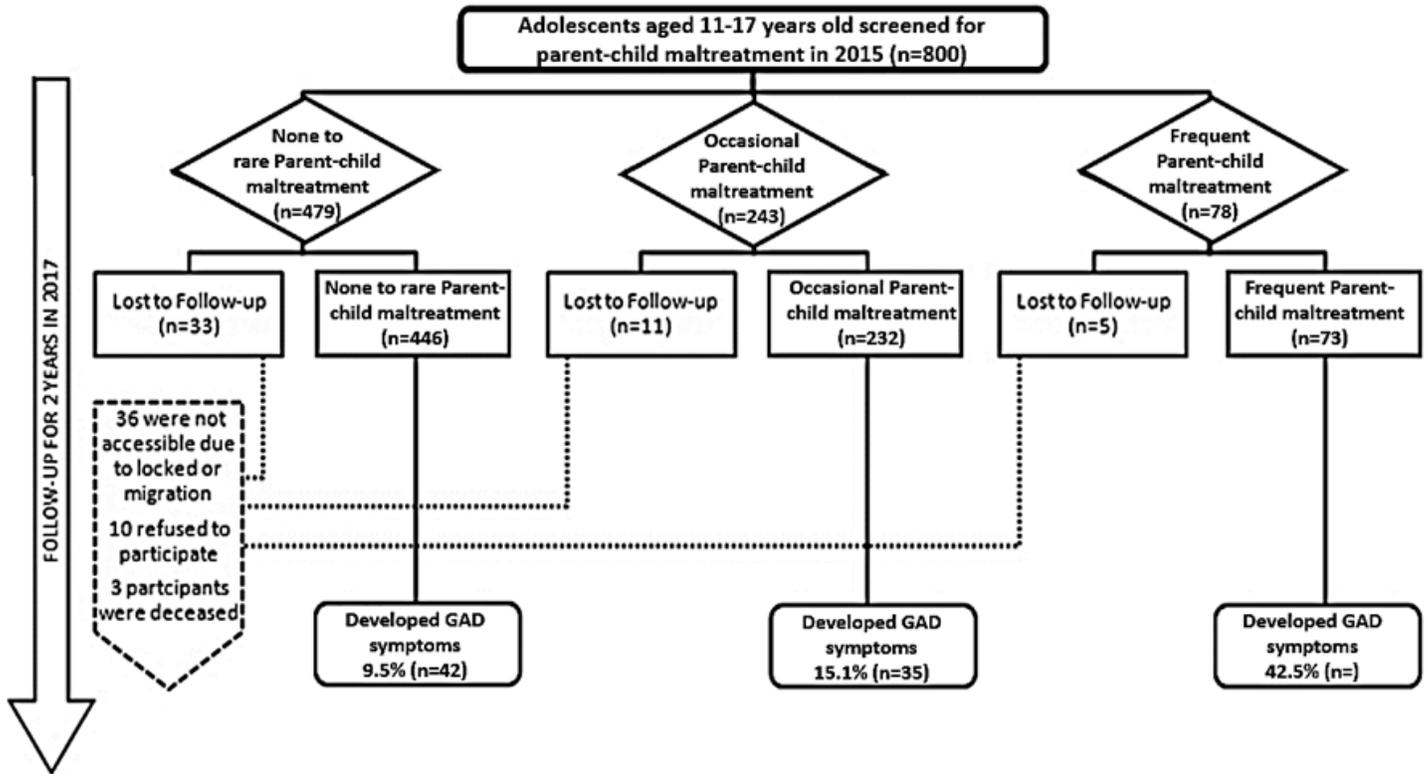


Figure 1

Flowchart of participants in the cohort study

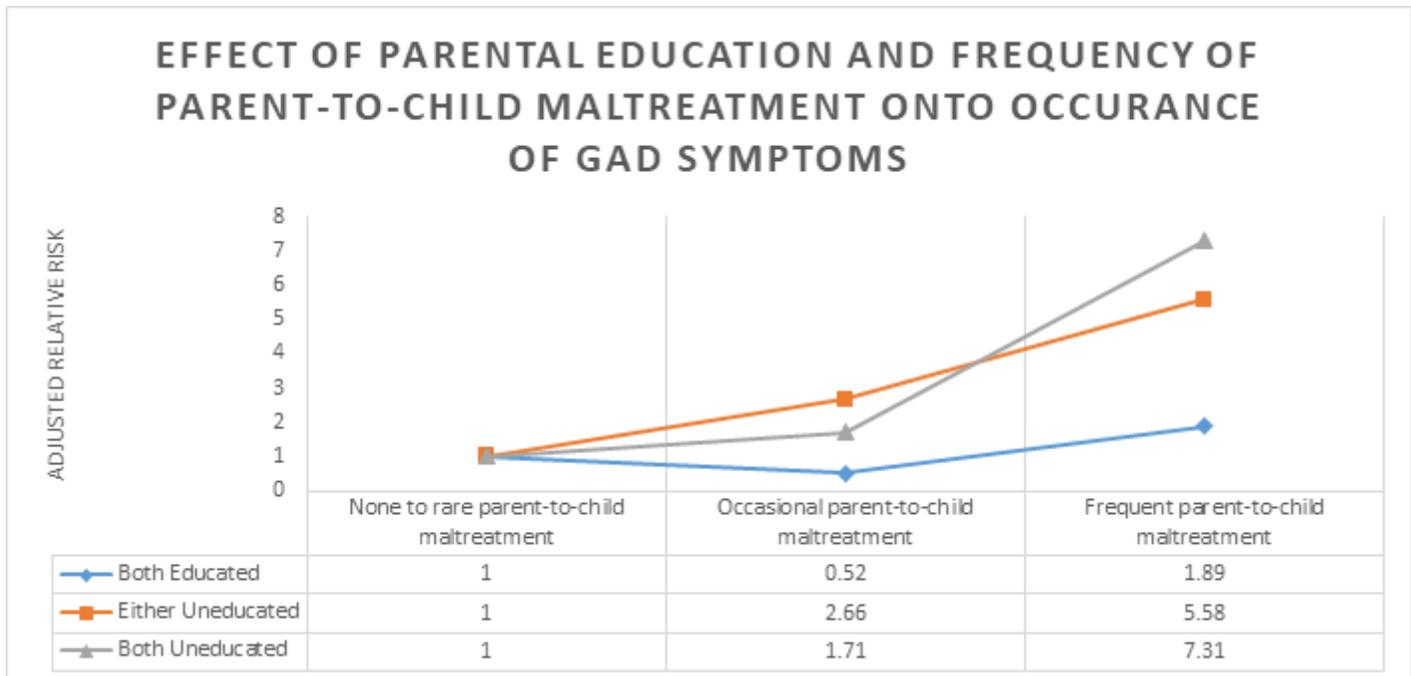


Figure 2

Whereas children whose both mother and father had no formal education, exposure to frequent childhood maltreatment by parents was associated with an 7 fold increase in risk (CI: 2.20-24.04) of developing symptoms of GAD as compared to none to rare exposure to parent-to-child maltreatment (Figure 2).