© Journal of the Indian Academy of Applied Psychology
January 2011, Vol.37, No.1, 98-105.

Cognitive Functioning in Children: The Role of Child Abuse, Setting and Gender

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The study aimed to investigate the role of child abuse, residential setting and gender in cognitive functioning of children. Child Abuse Checklist was used to identify abused and non-abused groups of children. Memory Span Test and Culture Fair Intelligence Test were used to assess the levels of working memory and intelligence in children. Results revealed that child abuse caused adverse impact on cognitive functioning of children. Working memory and intelligence level were found inferior in abused children as compared to non-abused counterparts. Urban children scored higher on cognitive measures than rural children. Gender effect was found partially significant. Though, girls were found inferior on working memory, however, on level of intellect boys and girls did not differ significantly. The roles of contextual variations and parental treatment of children in the course of cognitive development is discussed.

Keywords: Child Abuse, Cognitive Functioning, Working Memory, Intelligence.

Cognitive processes in relation to contextual variables have been widely investigated (Berry, 1976; Mishra, Dasen, & Nirula, 2003; Misra & Tripathi, 1980; Pandey, 2007; Tripathi, 1988). Cognitive processes include basic perceptual, memory processes to more complex thinking, reasoning, problem solving, creating, language and intelligence (Flavell, 1985; Matlin, 2004). Cognitive psychologists endeavored to explore how development of these cognitive processes has taken place from maturational to socio-cultural context. (Piaget, 1974; Vygotosky, 1978). Researchers have identified the pervasive role of eco-cultural factors in the development of cognitive functioning (Berry et al., 1986; Mishra, Sinha & Berry, 1996). Other studies have also evinced that unfavorable family circumstances and abusive treatment by parents and caregivers result in developmental failure and poor adaptation (Pandey, 2005; 2007).The lack of secure and consistent basis for relationship with adults, placed children at greater risk of child abuse and developmental impairments (Hurlock, 1984; Pandey, 2007).

Child abuse is a generic phrase which includes all behavior patterns, which are in some way injurious to the emotional or psychological well-being of child below 18 years of age. This problem intensely attracted social scientists and practitioners, following a seminal paper on the battered child syndrome in 1960, by Henary Kempe, Silverman, Steel, Drogemueller, and Silver (1962). Later on, Child abuse was considered an international emergency and in 1974, U.S. Congress passed, '*The Child Abuse Prevention and Treatment Act (i.e. PL 93-247)*'. This act defines *child abuse as, "the physical and mental injury, sexual abuse, negligence or maltreatment of the child, under the age of eighteen by a person who is responsible for child's welfare, which indicates the child health and welfare is threatened thereby*". A more comprehensive definition was also given by psychologists. According to Finkelhor and Korbin (1988), "*child abuse*

is the portion of harm to children that is proscribed, proximate and preventable".

The form of abuses differs nation to nation yet, four types of abuses are found common around the globe. These are: Child physical abuse, neglect, sexual and psychological/emotional abuse. The etiological factors of child abuse are numerous including psychological disturbances in parents, abuse eliciting characteristics of children, dysfunctional patterns of family interaction, stress inducing social forces and abuse promoting cultural values.(Belsky,1980; Finkelhor & Korbin 1988) In a major research study, Pandey (2005) investigated social dynamics of child abuse and its psychological consequences in eastern districts of U.P. Researcher evinced that various forms of abuses are present at alarming rate in different strata of society. However, forms of abuses differed in accordance with caste, community, socio economic status and occupational characteristics of family. Physical assaults, sexual harassments and educational neglects were found higher in low socio economic status, caste/ community, and labor class families, whereas, psychological abuse and emotional neglects were found at high level in middle and upper class families .Child abuse caused damaging effect on personality development, as well as cognitive, motivational and behavioral functioning of children (Pandey, 2005).

Researchers have identified several long term and short term consequences of child abuse on overall developments of children. (Wodarsky, Kurtz, Gaudin, & Howing,1990; Wolfe & Manion,1984). Impairments in cognitive functioning of children suffering from various forms of abuses have been identified widely. Studies report that physically abused children displayed poor on a variety of the measures of verbal acquisition, verbal language, memory and communication abilities, problem solving and motor skills (Fantuzzo, 1990; Hasket, 1990). Similarly, DePaul and Arruabarrena (1995) evinced that physically abused children were found low achievers and exhibited more learning disabilities. Wodarski et al. (1990) evinced that neglected children showed deficits in academic skills, language abilities, intellectual abilities and problem-solving skills. Other studies have also proved the impact of maltreatment on academic achievement, cognitive and intellectual functioning of children (Pandey, 2005; 2007). Apart from this, language deficits have been found in both receptive and expressive areas including more limited synaptic expression, functional communication and self related language (Azar, 1997; Fisher et al., 1997; McFaydon & Kitson, 1996; Fantuzzo, 1990; Coster et al. 1989). Cognitive functioning is also seriously affected by experiences of sexual abuse. Researchers identified that sexually abused children exhibit numerous cognitive problems viz.; academic problems, intellectual delay, lower level of intellect, receptive and expressive deficits, less creative and flexible in problem solving and deficits in language comprehension and verbal abilities (Einbender & Friedrich, 1989; Hunter, Goodwin, & Wilson, 1992; Rust & Troupe, 1991). Similarly, cognitive functions have been found to be associated with psychological abuse. The conditions include: low intelligence level, decline in mental competence, lack of impulse control, impaired learning, academic problems, low achievement level and impaired development of moral reasoning and poor academic performance (Crittendern, Claussen, & Sugarman, 1994; Egeland & Erickson, 1987; Hughes & Graham-Bermann, 1998). In a study, Pandey (2005) found that rural and abused children scored low on various domains of creativity. However, gender difference was identified only on originality, elaboration and flexibility dimensions of creativity test. In another study, Pandey

(2007) showed that abusive treatment by parents damaged cognitive skills i.e., perceptual differentiation ability and categorization ability in children.

Studies have also evinced the influence of residential setting on cognitive functioning of children. Rural children have been found inferior on various cognitive tasks (Mishra, 2001; Misra & Tripathi, 1980; Pandey, 2005; 2007). Researches evinced that acculturative influences due to urban contact lead to increase in the performance of perceptual and cognitive tasks (Mishra et al., 2003; Sinha & Mishra, 1988). Although, better performance on cognitive task as a function of urban background seems to be common, however, the aspects of task which are influenced by rural-urban familial background and abusive treatment by parents are not yet clear. Against this backdrop, the study aimed to investigate the impact of child abuse, residential setting and gender on cognitive functioning of children. Following hypotheses were formulated. It was hypothesized that:

1. Child Abuse would have unfavorable effect on cognitive functioning of children. Therefore, abused children would be found inferior on working memory and the level of intelligence. Various forms of abuses would contribute negatively in both forms of cognitive skills. Since abusive parents interact less often with their children and their interaction involves excessive control and demands, causing deficiencies in abused children (Lambright & Yamamotto, 1965; Pandey, 2007; Wolfe, 1984)

2. The type of residential background would influence the development of cognitive skills. Rural parents often fail to stimulate cognitive potentials of children timely, whereas, urban environment provides rich environment essential for cognitive development.

3. The level of cognitive functioning would vary among boys and girls. In our society boys are given more freedom and opportunity to learn skills than girls (Pandey, 2005). Thus, it was expected that boys would display better on both measures of cognition than girls.

Method

Design:

The study is based on a 2x2x2 factorial design with two levels of Abuse (Abused – Non abused) x Residential setting (Rural – Urban) x Gender (Boys – Girls).

Participants:

A total of 120 children age ranged from 8 to 15 yrs, mean age (M = 12.5 yrs.) enrolled in grades 4th to 8th from rural and urban residential background, participated in this study. The study was conducted in rural and urban areas of Gorakhpur District. The screening of abused and non abused children was done with the help of two strategies;(1) Reporting by neighbors, schoolteachers, health professionals and significant others then, (2)-Child abuse checklist was applied to determine the extent and forms of abuses. Stratified random sampling technique was used for the selection of participants.

Measures:

Child Abuse Checklist (CAC): The CAC developed and standardized by Pandey (2002). It has 105 items related to physical (32 items), sexual (8 items) and psychological abuse (35 items) and neglect (30 items). The CAC has 3 point scales ranging from “Often”` (3) to “Never” (1). The scores could range from 105 to 315. It measures the frequency and intensity of various forms of abuses and abuse as a whole. Its retest reliability has been estimated at .89. Against expert rating, it correlated significantly (r = .45).

Cognitive Measures:

(i) Memory Span Test: It was used (Pandey, 2002) to assess the level of working

memory in children. Three sets of 7 numbers varying 3 to 9 digits were devised (Pandey, 2002). After the presentation of each digit, children were asked to recall the number. Correctly recalled items denoted the memory span of children.

(ii) Culture Fair Intelligence Test (CFIT): In order to assess the intellectual capacity, CFIT (R.B. Cattell, 1972) was used. The test measures general intelligence across the culture. It consists of task requiring basic cognitive skills involving complex conceptualization. The age of children ranged from 8 to 15 years, thus, 2nd and 3rd scales of the test were used. The administration of the test was done in accordance with the procedure given in the manual. The participant's score was the number of correct solution done by him/her.

Procedure:

On the basis of preliminary survey, investigator visited to study setting, Children were contacted either in the school or at home and they were requested to participate in the study. After getting their consent, Personal Data Sheet (PDS) was distributed to obtain information about their personal and familial backgrounds. Afterwards, they were given child abuse checklist and were requested to respond on this checklist. Children were divided into abused and non abused groups on the basis of median score (Mdn. =156),on CAC. Above median scorers (158+) were identified as abused children and those who scored below 154 on CAC were considered as non abused children. Apart from this, secondary data and parent's interview were also considered in finalizing the cases of abused and non abused children. Again in the second session of the study, children were administered cognitive measures i.e., Memory Span Test and Culture Fair Intelligence Test. As soon as, children completed their responses on both measures, data were collected and scored according to defined rules. Scores were treated statistically in terms of comparative, correlational and regression analyses.

Results

It is apparent that the different groups of children varied significantly on both measures of cognitive process. ANOVA revealed significant effect of abuse, $F(1, 108) = 43.20$, $p<.01$, for working memory. The abused children were found inferior on working memory (M=3.5) as compared to non-abused children (M=4.55). The significant main effect of residential retting, $F(1,108) = 21.45$, $p<.01$, evinced that the ability of working memory was found poor in rural (M=3.65) as compared to urban counterparts (M=4.39). The main effect of gender was found significant $F(1,108)= 13.46$, $p<.01$, which revealed that boys showed superior working memory (M = 4.31) as compared to girls (M = 3.73). It is also reveal that the level of intellect varied significantly in different groups of children. The significant main effect of abuses, $F(1,108) = 63.91$, $p<.01$, evinced that abused children displayed poor on intelligence test (M = 67.66) as compared to non-abused children (M = 79.24). The main effect of residential setting was also significant, $F(1,108) = 25.93$, $p<.01$, which indicated that rural children showed low intelligence (M = 69.76) as compared to urban children (M = 77.14).

ANOVA results revealed that the abuse x setting interaction effect was significant, $F(1,108) = 4.98$, $p< .05$ for intelligence which indicates that the difference on intelligence level between rural and urban children was low in case of abused group of children, however in case of non-abused group, a clear-cut variation was found between rural and urban children. It appears that child abuse has caused adverse effect on cognitive ability of both settings of children. Correlational analysis was done to ascertain relationships between various forms of abuses and both measures of cognitive

functioning. Results revealed that child abuse was found negatively correlated with cognitive functioning. Working memory was found inversely related with physical abuse (r = - .38), psychological abuse, (r = - .37), abuse as a whole (r = - .39), emotional neglect (r = - .34), physical neglect (r = - .29), educational neglect (r = - .39) and neglect as a whole (r = - .38). Child abuse was also found negatively related with level of intellect. More specifically, intelligence was found negatively correlated with abuse as a whole (r = - .28), physical abuse (r = - .26), psychological abuse (r = - .27), emotional neglect (r = - .22), physical neglect (r = - .18), educational neglect (r = - .25) and neglect as a whole (r = - .23). A close perusal of correlation results suggested going for stepwise multiple regression analysis to determine percent contributions of predictors in criterion variables.

Results displayed in Table 1, evince that working memory was negatively explained by four factors i.e., educational neglect, physical abuse, psychological abuse and abuse as a whole. Educational neglect contributed maximum negatively (â = - .39, R^2 = .15) followed by physical abuse (â = - .22, R^2 = .18), psychological abuse (â = - .14, R^2 = .19) and abuse as a whole (â = - .77, R^2 = .46), (p<.01). Though, independently, educational neglect contributed maximum 15% variance, child physical neglect explained 3%, Psychological abuse explained only 1% and abuse as a whole contributed 2% variance, however, the composite contributions of abuse, along with psychological abuse, physical abuse, and educational neglect were identified 21% variance in working memory.

The results of multiple regression analysis (SWMRA), displayed in Table 1, further revealed that child abuse and neglect contributed negatively in the intelligence level. Neglect as a whole contributed maximum negatively (â = - .38, R^2 = .38), followed by psychological abuse (â = - .21, R^2 = .41). Though independently, neglect as a whole explained maximum negatively 15% variance and Psychological abuse predicted only 2.1% variance, however, the composite contributions of Psychological abuse alongwith neglect were 17% variance in the intelligence level of children. Findings, thus, evinced that child abuse and neglect have contributed negatively in the proper development of cognitive abilities in children.

Discussion

Results of the study evinced the adverse consequences of child abuse on cognitive functioning of children. Abused children were found far inferior in working memory and level of intellect as compared to non abused counterparts. Similarly, rural children displayed poor on measures of working memory and intelligence as compared to urban children. Although, working memory was found superior in boys than girls but, gender difference was

Table 1. Stepwise Multiple Regression Analysis of Cognitive Functions, i.e., Working Memory and Intelligence on to the various forms of Child Abuse

Predictors	R	R^2	R^2 change	â	F
Memory Span					
Educational Neglect	.39	.15	.15	- .39	59.77**
Physical Abuse	.43	.18	.03	- .22	36.81*
Psychological Abuse	.44	.19	.01	- .14	26.18**
Abuse as a whole	.46	.21	.02	- .77	21.92**
Intelligence					
Neglect as a whole	.38	.15	.15	- .38	56.57**
Psychological Abuse	.41	.17	.02	- .21	32.80**

**p<.01 *p<.05

non significant on the level of intellect. Present findings are supported by numerous empirical and theoretical evidences.

The predicting roles of child abuse, eco-cultural context and poor parenting in the development of cognitive processes have been systematically explored by researchers (Erickson, et al., 1984; Fantuzzo, 1990; Mishra, Dasen, Niraula, 2003; Pandey, 2007). Studies reported that psychologically abused children performed poorly as compared to non-abused children on a number of cognitive tasks including object memory, academic achievement and intelligence (Chan, 1994; Erickson, Egeland, & Painta 1989;). In a study, Pandey (2005) showed that child abuse impeded the proper development of creativity in children. Researcher (Pandey, 2007) further investigated and identified that abusive treatment by parents impaired the development of cognitive skills i.e., perceptual differentiation and categorization of verbal tasks. Abusive parents showed high expectation and were found less satisfied with achievement of their children. Cognitive functioning is also retarded by experiences of sexual abuse (Hunter et al., 1992). Many studies have proved that cognitive deficiencies were associated with psychological abuse (Crittenden et al., 1994; Hughes & Graham-Bermann, 1998).

Findings of the present study alongwith other researches evinced that parental abusive treatment retarded the development of cognitive functioning, since abusive parents develop poor relational bond with their children and their interaction involve high expectations causing damaging impact on development of cognitive abilities (Pandey, 2007; Wolfe & Manion, 1984). The results of this study can be supported by Attachment theory (Bowlby, 1980) which indicates that failure to form a secure attachment in early life may contribute to problems in adulthood in the forms of inability to develop close personal relationship. The insecure pattern of attachment was found high in abused and neglected children (Hurlock, 1984).

Present findings also showed that on both cognitive measures rural children were found inferior as compared to urban children. Other researches also evinced that rural setting lacks opportunities and enriched environment for stimulation needed for developing cognitive skills whereas, acculrative influences due to urban setting lead to promote cognitive abilities (Berry et al., 1986;Mishra et al; 2003;Pandey, 2005; 2007). In a study, Niraula and Mishra (2001) examined the development of memory for objects and their spatial location among rural and urban boys and girls of Newar community. They found a developmental trend in memory for object, however, environmental setting and gender exerted role in the performance of children. Other studies have also confirmed that rural children were found far inferior on cognitive functioning i.e., creativity, perceptual differentiation, verbal organization and levels of intellect (Donga, 1989; Pandey, 2005, 2007; Tripathi, 1988). Gender effect was found partially significant. Boys displayed better working memory as compared to girls. In our society boys are given better opportunity and freedom to learn skills than girls. Contrary to this, majority of girls of rural background and low – middle class families are deprived of such opportunities and facilities and therefore, are found inferior on some cognitive abilities as compared to boys (Nirula & Mishra, 2001; Pandey, 2005, 2007).

Present results can be interpreted on the basis of Socio-Cultural theory of Vygotosky (1978). The more pressure of stimuli in the environment is not sufficient for the development of the whole set of cognitive skills, however, the complex cognitive behaviors develop in the course of social interaction and contact with significant others who are more capable and skilled members of family or society. Those who lack such interactions, fail to learn a large number of activities in the absence of social stimulation. Present study evinced that abusive family context and rural residential background fail to provide adequate social stimulation for the proper development

of cognitive skills, since abusive parents interact less with their children or their interaction involves excessive restrictions and high expectation causing impairments in the normal development of children. Thus, to enhance cognitive skills in high risk children (abused and rural children), their parents and family members should be suggested to create opportunities for social stimulation and encouragement to children to take initiative and exercise innovative and diverse patterns of activities in daily life routines. Present results supported that eco-cultural variables also play significant role in the development of cognitive skills (Berry et al., 1986; Mishra et al., 2003; Pandey, 2007; Vygotosky, 1978).

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Received: June 6, 2010
Revision received: July 16, 2010
Accepted: November 23, 2010

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