Prevalence, Levels and Correlates of Intellectual Disability among Adolescents Incarcerated in a Correctional Facility in Kaduna, North-Western Nigeria

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Abstract

BACKGROUND

Adolescents with intellectual disability are disproportionately represented within correctional facilities. Studies have shown that such adolescents are vulnerable to manipulation and influence including coercion into homosexual relationships, as well as to being victims of homicide compared to others. However, there are few studies on intellectual disability among adolescents in correctional facilities in Northern Nigeria. This study thus aimed to assess the prevalence, levels and correlates of intellectual disability among adolescents in a correctional facility in Kaduna, Northwestern Nigeria

MATERIALS AND METHODS

This cross-sectional study was conducted among all the adolescents incarcerated at the Borstal Training Institution in Kaduna, North-western Nigeria between March and June 2018 who gave informed consent/assent. Data collection was done using a sociodemographic questionnaire; Raven's Progressive Matrices (RPM); Adverse Childhood Experiences (ACE) Questionnaire and Perceived parental support questionnaire.

RESULTS

The 93 participants aged 13 years to 19 years were all males with a mean age of 17.71 years (SD ±1.19). The majority (88.2%) were below average intellectually while 58.1% were intellectually defective. Participants with below-average IQ had experienced parental death (χ^2 = 4.099, p=0.043), had mothers with less than 12 years of education (χ^2 = 5.653, p=0.015) and scored lower on perceived combined parental support (t=-4.704, p=0.032), maternal (t=-4.334, p=0.000) and paternal support (t=-3.506, p=0.001).

CONCLUSIONS

Intellectual disabilities are prevalent among adolescents in incarceration. There is a need to put in place programs for the identification of such adolescents in our correctional facilities so that programs which minimize the disability while emphasizing the adolescents' strengths can be instituted thus probably reducing their representation in the prison population as well as enhancing the success of rehabilitation back into the society. In addition, identified correlates should be incorporated into targeted prevention strategies for vulnerable adolescents effectively and sustainably to reduce their occurrence.

Keywords: *Adolescents, Intellectual Disability, Correctional Facilities, Prevalence, Vulnerability.*

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Introduction

Adolescents with intellectual disability are disproportionately represented in the juvenile justice system compared to the general population (1). This could be because risk factors for juvenile delinquency, such as exposure to adverse childhood experiences (4,5) and poor perceived parental support, are also common among adolescents with intellectual disability. For instance, adolescents with intellectual disability are almost three times more likely (than those without) to also be victims of physical assault, sexual assault and robbery (6). Similarly, adolescents with intellectual disability are prone to parental rejection, avoidance and negative attitudes which could be due to parents having feelings of embarrassment towards these adolescents (7–9)

Prevalence rates of adolescents with intellectual disability within correctional facilities range from 4%-10% (10) to 28%(11). Lower prevalence rates were reported from studies that utilised trained psychologists and/or psychiatrists to examine offenders (12,13). Offenders with intellectual disability may be diverted to mental health services or probation, rather than correctional facilities, in countries with such services, like the UK, resulting in lower prevalence rates. (14). In Southwestern Nigeria, Bella *et al* (15) reported a prevalence of 18.6% for learning disabilities in their study of 59 children and adolescents living in the Ibadan Remand home, Southwest Nigeria. Atilola *et al* (16), found that 46.7% of their studied 67 adolescents living in remand homes had intellectual disabilities compared with 3.3% of controls. In addition, the mean IQ score of the remand home participants on the intelligence test was significantly lower than that of the control group.

Although juvenile crime rates have been steadily decreasing since the peak offence era of the 1990s (17) up to the present day (18,19), there is still concern, especially in sub-Saharan Africa where the youth population is high and more susceptible to engaging in vices that can lead to imprisonment (20,21). Studies have shown that adolescents with intellectual disability, who are incarcerated, are vulnerable to manipulation (1) and influence including coercion into homosexual relationships (2), as well as to being victims of homicide(3) compared to those who are not intellectually disabled. However, there is a paucity of data on the prevalence and levels of intellectual disability among adolescents in correctional facilities as well as its associated variables in Northern Nigeria.

This study thus aimed to determine the prevalence, levels and correlates of intellectual disability among adolescents in a correctional facility in Kaduna, Northwest Nigeria.

Materials and Methods

Study setting

This cross-sectional study unfolded within the confines of the Borstal Training Institution, situated in Kaduna, North-western Nigeria. Noteworthy is its status as one of the three analogous institutions in the country. Functioning under the auspices of the Nigerian Prison Service, it operates with a correctional focus, aiming at the reformation of juvenile and young offenders (22). Despite its restrictive nature, the institution integrates educational and vocational training, underscoring its commitment to the holistic development of incarcerated individuals.

Participant selection and exclusion criteria

Engaging adolescents aged 10-19 years within the institution, the study included those who willingly provided assent or informed consent. This age range was selected to capture a developmental span relevant to the study objectives.

To maintain the study's integrity, individuals demonstrating signs of mental instability, aggression, or disruptive behavior

were judiciously excluded. This ensured a conducive environment for data collection.

Data collection process

Individual interviews were conducted in a private facility area to ensure participant confidentiality. Recognizing literacy challenges among participants, all instruments were interviewer-administered. Research assistants handled sociodemographic questionnaires, while the Clinical Psychologist administered the Ravens Progressive Matrix. Other instruments were skillfully managed by experienced consultants and senior residents in Neuropsychiatry. Pretesting ensured inter-rater reliability, with Cohen's weighted kappa scores consistently exceeding 0.85.

Aligning with the institutional calendar, data collection spanned March to June 2018. Scheduling around institutional activities ensured minimal disruption and maximized participant cooperation.

Data collection instruments

A comprehensive data collection sheet captured socio-demographic information encompassing age, marital status, tribe, schooling, family settings, size, parental occupation, and reasons for institutionalization.

Adverse Childhood Experiences (ACE) questionnaire. To gauge adverse childhood experiences, the validated ACE Questionnaire was employed. This encompassed various categories, including physical abuse, neglect, psychological/emotional abuse, emotional neglect, sexual abuse, exposure to home violence, and living with household members with a history of substance abuse, mental illness, or imprisonment.

Perceived parental support: Six questions assessing perceived paternal and maternal support were incorporated, scored on a 4-point Likert scale. Cumulative scores delineated perceived parental support.

Raven's Progressive Matrices (RPM): Utilizing the Standard Progressive Matrices, the study employed RPM to assess participants' intelligence quotient (IQ). This nonverbal test, renowned for its cross-cultural applicability, comprised 60 multiple-choice questions categorized by difficulty levels. Percentile-based grading classified participants into intellect categories.

Justification for RPM selection

RPM's non-verbal approach minimized linguistic bias, facilitating recruitment across diverse geographical zones. Its ease of administration, cultural fairness, and suitability for individuals with motor challenges underscored its appropriateness.

Ethical considerations

Ethical approval was obtained from the Research and Ethics Committee of Federal Neuropsychiatric Hospital, Kaduna. Concurrently, formal permission to conduct the study was secured from the Management of Borstal Training Institution, Kaduna. Noteworthy is the waiver of parental consent, aligning with prevailing practices and considering the challenges associated with parental tracing (23). Participants were comprehensively informed about the study, and individual assent and informed consent were obtained.

Results

Demographic characteristics

Ninety-three (93) adolescents aged 13 years to 19 years from the correctional facility participated in the study. Table 1 shows the socio-demographic characteristics of the participants. They were all single, males with a mean age of 17.71 years ± 1.19 years. The majority of the participants were Northerners (87.1%), Muslims (53.8%) and were from monogamous families (65.6%). About a third (33.3 %) of participants' parents were not married and the mean number of years participants had spent in the correctional facility was 11.63 (±6.99) months. The majority of the participants were incarcerated for offences without victims (83.9%) while 29 (31.2%) had

committed offences in all three categories. Figure 1 shows the distribution of the participants' scores on the Ravens Progressive Matrix. The scores ranged from 8 to 45 with a mean score of 22.51 (± 10.97).

The majority of the participants (88.2%) had intellectual disability while 54 (58.1%) of them had scores in the intellectually defective category i.e. ≤ 5th percentile.

Table 1:
Socio-Demographic Characteristics of Participants (n=93)

Variables		N	%
Age (Years)	13 - 17	34	36.6
	18 – 19	59	63.4
Education	No Education	14	15.1
	Primary	2	2.2
	Some secondary	67	72.1
	Secondary	3	3.2
	Post-Secondary	7	7.5
Marital status (Participants)	Single	93	100.0
	Married	0	0.0
Marital status (Parents)	Married	62	66.7
	Not presently married	31	33.3
Employment before Incarceration	Schooling	38	40.9
	Job	15	16.1
	Both	37	39.8
	None	3	3.3
Religion	Islam	50	53.8
	Christianity	43	46.2
Ethnicity	Hausa	81	87.1
	Ibo	10	10.8
	Yoruba	2	2.1
Residence before Incarceration	Home	57	61.3
	Others	36	38.7
Birth order	First Born	26	28.0
	Middle Born	48	51.6
	Last Born	19	20.4
Mother's occupation	Employed	81	87.1
	Not Employed	12	12.9
Father's occupation	Employed	85	91.4
	Not Employed	8	8.6
Source of Referral	Parents	72	77.4
	Other relatives	7	7.5
	Others	14	15.1
	Court	0	0.0
Reasons for Incarceration	Offences against persons	35	37.6
	Crimes without victims	78	83.9
	Offences against property	70	75.3
	One category of offence	30	32.3
	Dual category of offences	34	36.6
	All categories of offences	29	31.2
	Mean duration of stay (Month)	11.63 (±6.99)	

No participant had scores in the categories of intellectually superior or above average. The mean time to completion of the Raven's Progressive Matrix, in minutes, was 28.71 (± 15.95). Table 2 shows the variables that were found to be significantly associated with intellectual disability. Participants with intellectual disability were more likely to record lower means scores on anticipated combined parental support (t=-4.704, p=0.032), maternal (t=-4.334, p=0.000) and paternal support (t=-3.506, p=0.001).

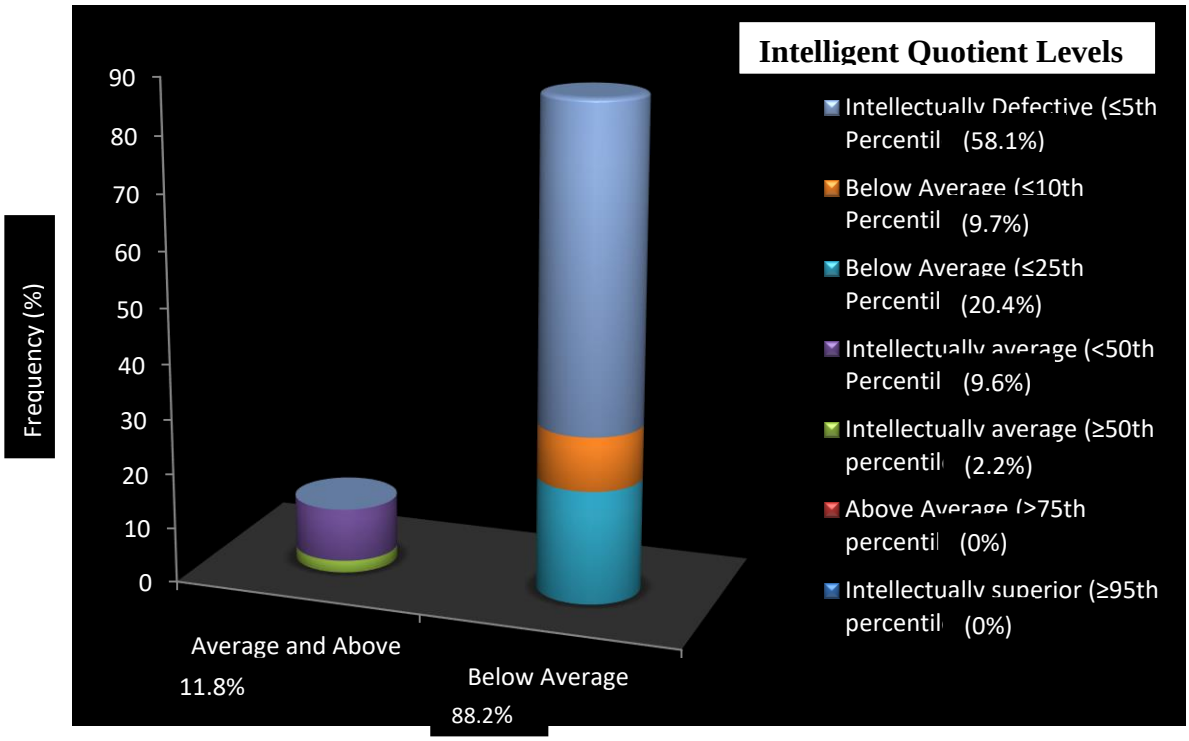

Figure 1:
Distribution of IQ scores on the Raven's Progressive Matrix (N = 93)

Table 2:
Variables That Are Significantly Associated with Intellectual disability among participants

		Intellectual Disability					
S/N	**VARIABLES**	**Yes**	**No**	**Total**	**Chi-square**	**df**	**P-value**
1	Parental Death						
	Yes	23 (100.0)	0 (0.0)	23			
	No	59 (84.3)	11(15.7)	70	4.099[a]	1	.043**
2	Mother's Educational level (Years)						
	<12 years	29 (100.0)	0 (0.0)	29			
	≥12 years	53 (82.3)	11 (17.7)	64	5.653[a]	1	.015**
3	Perceived Parental Support	38.41(9.37)	44.64(2.73)	-4.704	91		.032**
4	Perceived Paternal Support	17.52(6.35)	21.18(2.56)	-3.506	!30.69		.001**
5	Perceived maternal Support	20.89(4.93)	23.55(.93)	-4.334	!82.33		.000**

!Levene's correction: Unequal variances assumed

They were also more likely to have experienced parental death ($\chi^2 = 4.099$, p=0.043) as well as have a mother with less than 12 years of education ($\chi^2 = 5.653$, p=0.015). On multiple regression analysis, none of the variables found to be associated with intellectual disability in the participants were predictors.

Discussion

The mean age of our participants was 17.71 years (SD 1.19) and the majority of them (63.4%) were within the age group of 18-19 years. This finding is in keeping with findings from previous studies carried out in borstal institutions in Nigeria(33,34). The relationship between age and crime is one of the most solid within the field of criminology. This age-crime relationship has repeatedly demonstrated that criminal activities increase throughout adolescence, peak at age 17 (slightly earlier for property crime than for violent crime) and then gradually decline(35). All the participants were males, in keeping with findings from previous studies conducted in similar correctional facilities in the Country(36–38). This is attributable to the Act establishing the Borstal institutions which makes provisions for only male offenders (39).

The majority (88.2%) of participants had intellectual disability. Studies examining the origin of juvenile delinquency have continuously identified intellectual disability as a predictor of criminal behaviour (40,41). Persons who score relatively low on IQ tests are significantly more likely to have been arrested for an official crime, to self-report involvement in criminal behaviour, and to also hold and endorse pro-criminal attitudes and values when compared with persons who score relatively higher on IQ tests (42,43).

Various reasons have been proposed for this such as lower IQ restricting the probability of academic success at school. The academic failure experienced consequently increases the likelihood of delinquent acts (41). It has also been argued that delinquency, often associated with dropping out of school, results in an inability of adolescents to receive a sufficient minimum level of education thus making such adolescents vulnerable to delinquent acts. However, the disproportionate representation of adolescents with below-average IQ in correctional facilities could also be due to the increased likelihood of these adolescents being apprehended by law enforcement agents compared to their more intelligent counterparts. Beaver *et al*(44) found a statistically significant negative association between IQ scores and the probability of being arrested as well as the probability of being incarcerated in their analysis of data drawn from the National Longitudinal Study of Adolescent Health (Add Health), United States. Additionally, the increased risk of offending among adolescents with low IQ could be because risk factors for juvenile delinquency, such as exposure to adverse childhood experiences (4,5), are commoner among adolescents with low IQ. For instance, adolescents with low IQ are almost three times more likely (than those without) to also be victims of physical assault, sexual assault and robbery(6).

The prevalence of intellectual disability of 88.2% in this study is higher than what was reported by Bella *et al*(15) (18.6% vs 88.2%) and Atilola *et al*(16) (46.7% vs 88.2%). Bella *et al* (15) studied 59 children and adolescents living in the Ibadan Remand home, in Southwest Nigeria. Although Atilola *et al* (16) also studied adolescents from the same Remand home as Bella *et al*, their study was a comparative one that was conducted three years after and had 67 adolescents in each group.

The higher prevalence in our study could be attributed to several reasons. Firstly, the present study was conducted in the Borstal institution, unlike the other studies that were carried out in remand homes. Remand homes serve as detention/custody sites for juveniles awaiting trials, awaiting disposal after a guilty

verdict, transient custodial sites for juveniles in need of care and protection as well as juveniles beyond parental control. On the other hand, borstal institutions are specifically designated for the institutionalization of court sentenced juvenile offenders and in practice, only the more serious juvenile offenders are usually committed to the borstal institutions (45). Several studies have reported that individuals with below-average functioning are disproportionately represented within the prison population (46). Also, the current study was carried out in the Northern part of the country with a different sociocultural background from the Southwestern part of the country where the other studies were conducted. Additionally, male gender is a risk factor for low IQ (47) and this study was conducted on males only in contrast to the other studies. The use of different instruments to assess intelligent quotients could also account for the disparities observed in the prevalence.

However, the higher prevalence in this study could also be the result of an increasing trend, over the years, in the prevalence of low IQ. Bella *et al*(15) had a prevalence of 18.6% in 2010. Three years later, Atilola *et al* reported a prevalence of 46.7% in the same study centre. This current study was conducted 5 years later. Lai *et al*(47), in their study on gender and geographic differences in the prevalence of intellectual disabilities in Taiwan, noted an increasing trend over the years in the number of registered cases of intellectual disabilities for children and adolescents between 3 and 17 years old. A possible explanation for an increasing trend, over the years, in the prevalence of low IQ could be attributed to increasing levels of poverty in the country (48) as studies have found a negative correlation between IQ and poverty (49–51).

No participant had scores in the categories of intellectually superior or above average and this was not surprising as studies have found that intellectual disability, by its very nature, is a risk factor for delinquency (40,41). In addition, more intelligent adolescents are less likely to be apprehended by law enforcement agents compared to their counterparts with intellectual disability. Beaver *et al*(44) found a statistically significant negative association between IQ scores and the probability of being arrested as well as the probability of being incarcerated in their analysis of data drawn from the National Longitudinal Study of Adolescent Health (Add Health), United States.

We found a significant relationship between parental death and low IQ in participants (χ^2 = 4.099, p=0.043), in keeping with previous research findings (52). Fairthorne *et al*(52) found that mothers of children with intellectual disability were 40% more likely to die of cancer; 150% more likely to die of cardiovascular disease and nearly 200% more likely to die from misadventure than other mothers. Attachment theory posits that childhood loss of parents is one of the most serious stressful early life events (53) representing a profound psychological trauma that threatens children's social and emotional development (54) and with significant ramifications for the remainder of the child's life (55). According to the stress model (56), such chronic stress from childhood parental death can influence brain development thus increasing the risk of psychological disorders throughout their lifetime (57). These effects on brain development include persistent and pervasive changes in the prefrontal-hypothalamic-amygdala axis partially mediated by alterations in the hypothalamic-pituitary-adrenal axis with resultant impairment of memory and learning (58–61). Reduced hippocampal volume has also been reported and this is associated with deficits in learning processes as well (62,63).

Additionally, the life course theory propounded that parental death represents a negative life course trajectory which often reinforces the negative consequences of childhood adversity on an individual's

interpersonal functioning and available social support (64,65). This is even more so for adolescents with intellectual disabilities. For them, parental loss through death is not just the loss of someone they loved, but also the loss of someone likely to be the most familiar with their needs, their likes and dislikes, and with whom they shared a trusting relationship(66). This major childhood loss has been linked with a wide range of serious and enduring health and behavioural consequences ranging from schizophrenia to major depression and delinquency(67) particularly in adolescents (68,69). Draper and Hancock(69) found that any parentally bereaved child is significantly more likely, across the population, to score higher on the Rutter scale for delinquent behaviour. Raphael(68) observed that this could be because the loss generated longing for comfort and reassurance which, in girls, may lead to sexualized relationships that provide a sense of ego fusion with another, while boys may likely engage in petty theft, car-stealing, fights, drug-taking, or testing of authority systems.

Participants who have a mother with less than 12 years of education were more likely to have intellectual disability ($\chi 2 = 5.653$, p=0.015), similar to previous findings. Chapman *et al* (70) found that low maternal education resulted in the highest risk of intellectual disability to offspring compared with other factors such as maternal illness, delivery complications, gestational age at birth, and even very low birth weight. Women with education below the high school level were 8.9 times more likely to have a child with mild intellectual disability compared with women who had more than 12 years of education and were associated with 50.9% of cases of intellectual disabilities that they studied. The capital theory provides a useful exploration of the mechanisms of the effects of maternal education on children's intelligence (71). It propounds that higher maternal education increases mothers' access to different forms of currency namely human capital (such as language use as well as quantity and quality of engagement in cognitively stimulating parenting practice), cultural capital (for example, negotiation and management of school experiences), social capital (including a collection of educational information and exposure of children to multiple role models with high educational achievement) and psychological capital all of which are then expended in a variety of ways to promote their children's cognitive skills amongst others (72–76).

Participants with below-average IQ were more likely to record lower means scores on perceived combined parental support (t=-4.704, p=0.032), maternal (t=-4.334, p=0.000) and paternal support (t=-3.506, p=0.001). This is similar to previous studies that have reported parental negative attitudes towards their children with mental retardation and could be due to parents having feelings of embarrassment towards these children (7–9). Adolescents with intellectual disability are more likely to experience parental negative attitudes, rejection and ultimately, poor parental support. The Parental Acceptance Rejection Theory (PAR Theory) (77) linked parental rejection to increased pessimism, hostility, aggression and delinquency in affected children. Parental negative attitudes, rejection and poor support have also been linked to increased exposure of children to adverse childhood experiences (ACES) particularly through emotional unavailability and discipline strategies (78).

Recommendations

In light of the above findings, early identification of adolescents with intellectual disability within correctional facilities is recommended so that specific programs which minimize the disability while emphasizing the children's strengths can be instituted. These programs could include the provision of facilities for inclusive education and the provision of facilities for vocational training within correctional facilities. Such targeted programs

could help towards the successful rehabilitation and release of such adolescents back into the community. In addition, there is a need to increase efforts towards reducing childhood parental loss and encouraging parental support of children with intellectual disabilities. In the community, education of the girl-child should be actively encouraged which may include formulation and implementation of girl-child-specific education policies to improve the level of maternal education.

Limitation

This study was conducted among adolescents incarcerated in a correctional facility and thus generalization to adolescents in the community may be limited. This is because such adolescents in incarceration have been reported to have an increased likelihood of experiencing some risk factors found to predispose them to incarceration such as exposure to adverse childhood experiences and poor perceived parental support which were also likely to predispose them to intellectual disability and which may not apply to the adolescents in the community.

The activities of daily living could not be utilized in assessing the intellectual functioning of participants owing to the inability to interview parents or caregivers. Assessment of activities of daily living comprises one of the three criteria for the diagnosis of intellectual disability in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, (DSM-5) and the International Classification of Diseases, Tenth Revision (ICD-10).

This is a cross-sectional study and thus causality between intellectual disability and delinquency cannot be inferred. In clinical medical research, causality is best demonstrated by randomized clinical trials (RCTs). However, in some ethical and practical cases, an RCT cannot be conducted and knowledge may be derived from an observational study instead.

Conclusion

Despite its limitations, this study found a high prevalence of intellectual disability among adolescents in correctional facilities. Adolescents with intellectual disability were more likely to have experienced parental death, poor parental support as well and have a mother with less than 12 years of education. Stakeholders in the juvenile justice system and the social welfare departments need to pay increased attention to adolescents with intellectual disabilities within the correctional facilities to enhance successful rehabilitation and release back into the community.

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References

1. **Cockram J.** People With an Intellectual Disability in the Prisons. *Psychiatry, Psychol Law*. 2005;12(1):163–73.
2. **Permund SH, Alexander-Rodriguez T, Macleod S, Kelley KF.** History of sexual abuse in incarcerated adolescents with gonorrhoea or syphilis. *Adolesc Heal CARE*. 1990;11:449–52.
3. **Cunningham MD, Sorensen JR, Vigen MP, Woods SO.** Inmate homicides: Killers, victims, motives, and circumstances. *J Crim Justice*. 2010;38:348–58.
4. **Hatton C, Emerson E.** The Relationship Between Life Events and Psychopathology Amongst Children with Intellectual Disabilities. *J Appl Res Intellect Disabil*. 2004;17:109–17.
5. **Baglivio MT, Epps N, Swartz K.** The Prevalence of Adverse Childhood Experiences (ACE) in the Lives of Juvenile Offenders. *J Juv Justice*. 2014;3(2):1–17.
6. **Blodgett C, Lanigan JD.** The association between adverse childhood experience (ACE) and school success in elementary school children. *Sch Psychol Q*. 2018;33(1):137–46.

7. **Nancy G.** Attitudes of parents towards their mentally retarded children: A rural area examination [Internet]. University of Zululand; 2002. Available from: http://uzspace.uzulu.ac.za/hand
8. **Shamim M, Abdella A, Osman M.** Parental attitudes towards children with mental retardation : Across sectional study from NGOs in Northern India Abstract : Introduction : Material and Methods : *Int J Res Heal Sci.* 2015;2321 – 725(2):267–73.
9. **Price-bonham AS, Addison S, Ham SP, Addison S.** Families and Mentally Retarded Children : Emphasis on the Father Published by : National Council on Family Relations Stable URL : http://www.jstor.org/stable/582583 Families and Mentally Retarded Children : Emphasis on the Father *. 2016;27(3):221–30.
10. **Petersilia J.** Unequal justice? Offenders with mental health retardation in prison. *Correct Manag Q*. 1997;1:36-44.
11. **Murphy M, Harrold M, Carey S, Mulrooney M.** A survey of the level of learning disability among the prison population in Ireland. Dublin. *Irish Department Justice, Equal Law Reform.* 2000;
12. **Birmingham L, Mason D, Grubin D.** Prevalence of mental disorder in remand prisoners: consecutive case study. *BMJ*. 1996;313:1521–4.
13. **Ghubash R, El-Rufaie O.** Psychiatric morbidity among sentenced male prisoners in Dubai: Transcultural perspectives. *J Forensic Psychiatry*. 1997;8:440–6.
14. **Mason J, Murphy G.** Intellectual disability amongst people on probation: Prevalence and outcome. *J Intellect Disabil Res.* 2002;46:230–8.
15. B**ella T.T, Atilola O, Omigbodun O.O.** Children Within The Juvenile Justice System In Nigeria: Psychopathology And Psychosocial Needs. *Ann Ibadan Postgrad Med.* 2010;8(1):34–9.
16. **Atilola O, Omigbodun O, Bella-Awusah T, Lagunju I, Igbeneghu P.** Neurological and intellectual disabilities among adolescents within a custodial institution in South-West Nigeria. *J Psychiatry Ment Heal Nurs*. 2013;21(1).
17. **University of Pennsylvania.** Understanding the "Whys" Behind Juvenile Crime Trends [Internet]. Pennsylvania: Office of Juvenile Justice and Delinquency Prevention; 2012. 1–7 p. Available from: https://www.ncjrs.gov/pdffiles1/ojjdp/grants/248954.pdf
18. **Young S, Greer B, Church R.** Juvenile delinquency, welfare, justice and therapeutic interventions: a global perspective. *BJPsych Bull*. 2017;41:21–9.
19. **Puzzanchera C, Harp C.** Juvenile Justice Statistics | Juvenile Arrests, 2016. Natl Rep Ser Bull. 2018;1–12.
20. **Office of the Special Adviser on Africa (OSAA)**. The Exploding Youth Population in Sub-Saharan Africa [Internet]. New York; 2016. Available from: https://www.cornell.edu/
21. **Office of the Special Adviser on Africa (OSAA**). Peace, Security and Development » Youth Empowerment [Internet]. New York; 2016. Available from: https://www.un.org/en/africa/osaa/peace/youth.shtml
22. **Sarki ZM, Abdullahi A, Mukhtar JI.** The Role of Borstal Homes in Nigeria : Reformation or Remaking Criminality ? Akademia Baru Journal of Advanced Research in Social The Role of Borstal Homes in Nigeria : Reformation or Remaking Criminality ? *J Adv Res Soc Behav Sci J*. 2018;12(1):17–23.
23. **Shaffer D**. Use of passive consent in child and adolescent mental health research; effects of letter from Dr Charles R. McCarthy, director of the office for protection from research risks, NIH (editorials). *Res notes Child Adoles_cent Psychiatry, Summer*. 1992;10.
24. **Felitti V, Anda R, Nordenberg D.** Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The Adverse Childhood Experiences (ACE) Study. *Am J Prev Med*. 1998;14(4):245–58.
25. **Oladeji B, Makanjuola V, Gureje O.** Family-related adverse childhood experiences as risk factors for psychiatric disorders in Nigeria. *Br J Psychiatry*. 2010;196:186–91.
26. **Chapman DP, Anda RF, Fellitti VJ, Dube SR, Edward VJ, Whitfield CL.** Epidemiology of adverse childhood experiences and depressive disorders in a large health maintenance organization population. *J Affect Disord*. 2004;82:217–25.
27. **Anda R.** The health and social impact of

growing up with adverse childhood experiences. The human and economic costs of the status quo. In: Adverse Childhood Experiences Study [Internet]. Anda, Ro. (2007). The Health and Social Impact of Growing Up With Adverse Childhood Experiences The Human and Economic Costs of the Status Quo. Conference in Anacortes, WA on June, 1–20. Retrieved from https://wiki-new.software.umn.edu/pub/MedDuluth/Semin ; 2007. p. 1–20. Available from: www.acestudy.org

28. **Wyatt GE.** The sexual abuse of Afro-American and white-American women in childhood. *Child Abuse Negl.* 1985;9:507–19.
29. **Shaw BA, Krause N, Chatters LM, Connell CM, Ingersoll-Dayton B**. Emotional support from parents early in life, ageing, and health. *Psychol Aging*. 2004;19(1):4–12.
30. **Bilker WB, Hansen JA, Brensinger CM, Richard J, Gur RE, Gur RC.** Development of Abbreviated Nine-Item Forms of the Raven's Standard Progressive Matrices Test. *Assessment* [Internet]. 2012 Sep 17;19(3):354–69. Available from: http://journals.sagepub.com/doi/10.1177/1073191112446655
31. **Kaplan RM, Saccuzzo DP.** Psychological testing: Principles, applications, and issues. In: Standardized tests in education, civil service, and the military. 7th ed. Belmont, CA: *Wadsworth*.; 2009. p. 325–327.
32. **Raven J.** Standard Progressive Matrices. London, *UK HK Lewis.* 1958;
33. **Adegunloye OA, Yusuf AD, Ajiboye PO, Issa BA, Buhari ON.** Prevalence and correlates of disruptive behavior disorders in Youths in a Juvenile Borstal Institution. *Niger J Psychiatry*. 2010;8:12 – 17.
34. **Olashore AA, Akanni OO, Olashore OO**. Associate Factors of Delinquency Among Incarcerated Male Juveniles in a Borstal Institution in Nigeria Associate Factors of Delinquency Among Incarcerated Male Juveniles in a Borstal. *Int J Forensic Ment Health* [Internet]. 2017;1–8. Available from: http://dx.doi.org/10.1080/14999013.2017.1288668
35. **Cornelius CVM, Lynch CJ, Gore R.** Aging Out Of Crime: Exploring The Relationship Between Age And Crime With Agent Based Modeling. In: Spring Simulation Multi-Conference - Agent Directed Simulation (SpringSim-ADS) 2017 At: *Virginia Beach* VA. 2017. p. 1–12.
36. **Ebiti NW, Ike JO, Sheikh TL, Lasisi DM, Babalola J, Agunbiade S, *et al***. Determinants of psychoactive substance use among incarcerated delinquents in Nigeria. *African J Drug Alcohol Stud.* 2012;11(2):117–27.
37. **Ajiboye PO, Yussuf AD, Issa BA, Adegunloye OA, Buhari ON.** Current and lifetime prevalence of mental disorders in juvenile borstal institutions in Nigeria. *Res J Med Sci.* 2009;3(1):26–30.
38. **Omole OE.** Physical And Psychological Health Status Of Young People In The borstal training institution, Ilorin, Kwara State, Nigeria. (Babcock University); 2013.
39. **Sarki ZM, Abdullahi A, Mukhtar JI**. The Role of Borstal Homes in Nigeria: Reformation or Remaking Criminality? *J Adv Res Soc Behav Sci J.* 2018;12(1):17–23.
40. **Bobbio A, Arbach K, Redondo S.** Juvenile delinquency risk factors: Individual, social, opportunity or all of these together? *Int J Law Crime Justice* [Internet]. 2020;1–11. Available from: https://doi.org/10.1016/j.ijlcj.2020.100388
41. **Diaz A, Belena A, Baguena MR.** The role of gender in juvenile delinquency: Personality and intelligence. *Pers Individ Dif.* 1995;16(2):309–14.
42. **Mcnulty TL, Bellair PE, Watts SJ.** Neighborhood Disadvantage and Verbal Ability as Explanations of the Black-White Difference in Adolescent Violence : Toward an Integrated Model. *Crime Delinq*. 2013;59(1):140–60.
43. **Moffitt TE, Caspi A, Silva PA, Stouthamer-Loeber M**. Individual differences in personality and intelligence are linked to crime: Cross-context evidence from nations, neighborhoods, genders, races, and age-cohorts. In: Hagan J, editor. *Current perspectives on ageing and the life cycle Delinquency and disrepute.* 1995. p. 1–34.
44. **Beaver KM, Schwartz JA, Nedelec JL, Connolly EJ, Boutwell BB, Barnes JC**. Intelligence is associated with criminal justice processing : Arrest through incarceration. *Intelligence* [Internet]. 2013;41(5):277–88. Available from: http://dx.doi.org/10.1016/j.intell.2013.05.001
45. **Abuchi UK**. What You Need To Know About Borstal Training Institution - PRNigeria News

[Internet]. Nigeria Press Release; 2018. Available from: https://prnigeria.com/2018/05/09/what-borstal-training-institution/

46. **Freeman J**. The relationship between lower intelligence, crime and custodial outcomes : a brief literary review of a vulnerable group. Vulnerable Groups & Inclusion,. 2012;8023:1–16.
47. **Lai D, Tseng Y, Hou Y, Guo H.** Gender and geographic differences in the prevalence of intellectual disability in children: Analysis of data from the national disability registry of Taiwan. *Res Dev Disabil* [Internet]. 2012;33(6):2301–7. Available from: http://dx.doi.org/10.1016/j.ridd.2012.07.001
48. **Sasu DD**. People living in extreme poverty in Nigeria 2016-2022, by gender. *Statista* [Internet]. 2013; Available from: https://www.statista.com/statistics/1287827/number-of-people-living-in-extreme-poverty-in-nigeria-by-gender/
49. **Mani A, Mullainathan S, Shafir E, Zhao J.** Poverty Impedes Cognitive Function. Science (80-) [Internet]. 2013 Aug 30;341(6149):976–80. Available from: https://www.science.org/doi/10.1126/science.1238041
50. **Ghazi HF, Isa ZM, Aljunid S, Shah SA, Tamil AM, Abdalqader MA.** The negative impact of living environment on intelligence quotient of primary school children in Baghdad City, Iraq: a cross-sectional study. *BMC Public Health* [Internet]. 2012 Dec 27;12(1):562. Available from: http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-12-562
51. **Poh BK, Lee ST, Yeo GS, Tang KC, Noor Afifah AR, Siti Hanisa A, *et al*.** Low socioeconomic status and severe obesity are linked to poor cognitive performance in Malaysian children. *BMC Public Health* [Internet]. 2019 Jun 13;19(S4):541. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-019-6856-4
52. **Fairthorne J, Hammond G, Bourke J, Jacoby P**. Early Mortality and Primary Causes of Death in Mothers of Children with Intellectual Disability or Autism Spectrum Disorder : A Retrospective Cohort Study. *PLoS One*. 2014;9(12):1–15.
53. **Bowlby J.** Attachment and loss: Retrospect and prospect. *Am J Orthopsychiatry* [Internet]. 1982 Oct;52(4):664–78. Available from: https://psycnet.apa.org/doi/10.1111/j.1939-0025.1982.tb01456.x
54. **Raza S, Adil A, Ghayas S**. Impact of Parental Death on Adolescents ' Psychosocial Functioning Impact of Parental Death on Adolescents ' Psychosocial Functioning. *J Psychosoc Res.* 2008;3(1):1–11.
55. **Jakobsen IS, Christiansen E.** Young people's risk of suicide attempts in relation to parental death: a population-based register study. *J Child Psychol Psychiatry* [Internet]. 2011 Feb;52(2):176–83. Available from: https://onlinelibrary.wiley.com/doi/10.1111/j.1469-7610.2010.02298.x
56. **Kaufman J, Charney D**. Effects of early stress on brain structure and function: Implications for understanding the relationship between child maltreatment and depression. *Dev Psychopathol* [Internet]. 2001 Sep 27;13(3):451–71. Available from: https://www.cambridge.org/core/product/identifier/S0954579401003030/type/journal_article
57. **Rostila M, Berg L, Arat A, Vinnerljung B, Hjern A.** Parental death in childhood and self-inflicted injuries in young adults- a national cohort study from Sweden. *Eur Child Adolesc Psychiatry* [Internet]. 2016 Oct 1;25(10):1103–11. Available from: http://link.springer.com/10.1007/s00787-016-0833-6
58. **McEwen BS.** The resilient brain: Epigenetics, stress and the life course. *Psychoneuroendocrinology* [Internet]. 2017 Sep;83:76. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0306453017310879
59. **Eichenbaum H.** Prefrontal–hippocampal interactions in episodic memory. *Nat Rev Neurosci* [Internet]. 2017 Sep 29;18(9):547–58. Available from: https://www.nature.com/articles/nrn.2017.74
60. **Thayer JF, Lane RD.** Claude Bernard and the heart-brain connection: Further elaboration of a model of neurovisceral integration. *Neurosci Biobehav Rev* [Internet]. 2009 Feb;33(2):81–8. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0149763408001255
61. **Smith KE, Pollak SD.** Early life stress and development: potential mechanisms for adverse outcomes. *J Neurodev Disord* [Internet]. 2020

Dec 16;12(1):34. Available from: https://jneurodevdisorders.biomedcentral.com/articles/10.1186/s11689-020-09337-y

62. **Davis EP, Stout SA, Molet J, Vegetabile B, Glynn LM, Sandman CA, *et al.*** Exposure to unpredictable maternal sensory signals influences cognitive development across species. *Proc Natl Acad Sci* [Internet]. 2017 Sep 26;114(39):10390–5. Available from: https://pnas.org/doi/full/10.1073/pnas.1703444114
63. **Hanson JL, van den Bos W, Roeber BJ, Rudolph KD, Davidson RJ, Pollak SD.** Early adversity and learning: implications for typical and atypical behavioral development. *J Child Psychol Psychiatry* [Internet]. 2017 Jul;58(7):770–8. Available from: https://onlinelibrary.wiley.com/doi/10.1111/jcpp.12694
64. **Kuh D, Ben-Shlomo Y, Lynch J, Hallqvist J, Power C**. Life Course Epidemiology. *J Epidemiol Community Heal.* 2003;57(10):778–83.
65. **Björkenstam E, Hjern A, Björkenstam C, Kosidou K**. Association of Cumulative Childhood Adversity and Adolescent Violent Offending With Suicide in Early Adulthood. *JAMA Psychiatry* [Internet]. 2018 Feb 1;75(2):185. Available from: http://archpsyc.jamanetwork.com/article.aspx?doi=10.1001/jamapsychiatry.2017.3788
66. **Mason VA**, Dowling SF. Bereavement In The Lives Of People With Intellectual Disabilities. *Intellectual Disability and Health*. 2016;
67. **Committee for the Study of Health Consequences of the Stress of Bereavement Institute of Medicine**. Bereavement During Childhood and Adolescence. In: Osterweis M, Solomon F, Green M, editors. Bereavement: Reactions, Consequences, and Care. 5th ed. *National Academy of Sciences*; 1984. p. 99–144.
68. **Raphael B.** The Anatomy of Bereavement. New York: *Basic Books;* 1983.
69. **Draper A, Hancock M.** Childhood parental bereavement: the risk of vulnerability to delinquency and factors that compromise resilience. *Mortality*. 2017;16(4):285–306.
70. **Chapman DA, Scott KG, Mason CA.** Early risk factors for mental retardation: role of maternal age and maternal education. *Am J Ment Retard*. 2002;107(1):46–59.
71. **Harding JF, Morris PA, Hughes D.** The Relationship Between Maternal Education and Children's Academic Outcomes: A Theoretical Framework. *J Marriage Fam* [Internet]. 2015 Feb;77(1):60–76. Available from: https://onlinelibrary.wiley.com/doi/10.1111/jomf.12156
72. **Coleman JS**. Social capital in the creation of human capital. *Am J Sociol.* 1988;94:S95–120.
73. **Crosnoe R, Kalil A.** Educational progress and parenting among Mexican immigrant mothers of young children. *J Marriage Fam.* 2010;72(4):976–90.
74. **Lareau A.** Unequal childhoods: Class race, and family life. Berkeley, CA *Univ Calif Press.* 2011;
75. **Portes A**. Two meanings of social capital. Social Forum. 2000;15(1):1–12.
76. **Augustine JM, Crosnoe R.** Mothers' depression and educational attainment and their children's academic trajectories. *J Heal Soc Behav*. 2010;51(3):274–90.
77. **Rohner RP, Britner PA.** Worldwide mental health correlates of parental acceptance-rejection: Review of cross-cultural and intracultural evidence. *Cross- Cult Res.* 2002;36:16–47.
78. **Aydın A, Yamaç A.** The Relations Between The Acceptance and Child-Rearing Attitudes of Parents of Children With Mental Disabilities. *Eurasian J Educ Res.* 2014;14(54):79–98.