ANALYSIS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER AND SUBSTANCE ABUSE AMONG PRISON INMATES

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ABSTRACT

Drug use choice and pattern is often initiated from childhood and gradually increases through adolescence and adulthood, Attention Deficit Hyperactivity disorder (ADHD) is a substantive predictor of substance use. This paper analyzed ADHD and substance abuse: its effects and implications on prison inmates. Data was collected from 70 (66 males and 4 females) prison inmates who use and abuse substances. Out of them 54% admitted to being gainfully employed and 34% were unemployed. The 25 items Wender Utah Rating Scale (WURS) was adopted to assess the ADHD. Chi square was used to test our hypothesis and Content analysis was used to explore the drug use choice and subsequent relationship between ADHD and drug choice. Results revealed that there was a significant relationship between AD/HD and methamphetamine ($\chi^2 = 12.323$, $p = 0.006$), cocaine use ($\chi^2 = 12.712$, $p = 0.005$), and crack cocaine ($\chi^2 = 13.899$, $p = 0.003$). Alcohol, cannabis, solvent, heroin, LSD, ecstasy, tranquilizers, cough syrup and Raquinol however showed no significant relationship with ADHD.

Key words: Attention Deficit Hyperactivity Disorder, substance use and prison inmates

INTRODUCTION

The abuse of alcohol and drugs continues to be one of the primary concerns of Families in Nigeria. Researches over the past four decades indicate that children diagnosed with attention deficit hyperactivity disorder (ADHD) are at increased risk of developing substance abuse disorders compared to the general population (Cretzmeyer, 2006). Properly prescribed medications and appropriate behavioral therapies have helped to reduce this risk. However, despite these therapeutic interventions, the risk remains. Specifically, higher incidence of substance abuse problems continues to occur among individuals with ADHD that are either seeking treatment or not (Cretzmeyer, 2006). The menace

associated with substance use manifest with enormous effects in; complicated health consequences, heavy financial implications on drug related treatment, a truncated society's productivity and drop in output/man power. The cost associated with drug-related crime are quite enormous and the subsequent loss of lives as the extreme manifestation of the harmful effects of substance use. Recent studies (Molina & Pelham, 2003) have found ADHD to be as significant a risk factor for future substance abuse as parental history of addiction, the generally accepted major risk factor for substance abuse among youth (Cotton, 1979; Kaij, 1960; McNeece & DiNitto, 1998; Midanik, 1983). *Attention deficit hyperactivity disorder* (ADHD)—is defined as a neurobehavioral disorder characterized by inattentive or impulsive behaviors (or both) that are inappropriate for the patient's developmental level and interfere with optimal functioning (American Psychiatric Association, 1994). ADHD is one of the most commonly diagnosed behavior disorders of childhood, occurring at an estimated rate of 3-9% in school-aged children (Barkley, 1998; Markowitz, Straughn, & Patrick, 2003). ADHD is diagnosed more often in boys than in girls with boy-girl ratios ranging from 2:1 to 9:1 (Elia, Ambrosini, & Rapoport, 1999; Goldman, Genel, Bezman, & Slanetz, 1998). Without treatment, these children often experience low self-esteem, academic difficulties and poor interpersonal relationships. Estimates of the cost of medical care for children with ADHD, compared to those without the disorder, are more than double and are comparable to costs for children with other major medical disorders such as asthma (Chan, Zhan, & Homer, 2002; Leibson, Katusic, Barbaresi, Ransom, & O'Brien, 2001).

Stimulant medications have been advocated for treatment of hyperactivity disorder as early as 1937 (Solomons, 1971a, 1971b, 1973), but not without concerns regarding safety of use. Studies by Solomons in the early 1970s identified many concerns regarding the side effects of the medication and the potential for its abuse.

These concerns included not only the potential for misuse by the diagnosed child but also misuse by parents and siblings who might take the drugs themselves. Recent increases in the diagnosis of ADHD, as well as increased use of prescription medications for these children (Zito, Safer, Reis, Gardner, Boles, & Lynch, 2000), have heightened the concerns, particularly for children of low-income families. Because medication is less costly than behavioral treatments for ADHD, children of lower socioeconomic status are more likely to be prescribed stimulant medication without attendant behavioral therapies following diagnosis, increasing the risk of medication misuse.

The overwhelming majority of helping professionals agree that medication alone is not an adequate solution to this problem. Although some researcher identified stimulant medication in the treatment of ADHD as a protective factor (Barkley, Fischer, Smallish, & Fletcher, 2003; Biederman, Wilens, Mick, Spencer, & Faraone, 1999; Loney, Kramer, & Salisbury, 2002), other aspects

of the diagnosed child's environment that may contribute to risk or protection related to future substance abuse are not as clearly identified.

Substance abuse is a complex phenomenon that has biological, social and psychological predictors and consequences. Even the distinction between abuse and use is complicated and in many situations, relative to the person and context. Furthermore, the description of substance use is not straightforward, which means that clinicians and researchers must ask about age of first use, current use preferences of drugs and route of administration, and substances that lead to the most significant problems. Various authors have attempted to describe and explain substance use and abuse, but their descriptions have not become empirically supported theory. No commonly accepted theory exists. Thus, although many quasi-theories about substance abuse can be identified, they are not particularly useful when describing and connecting such complex biopsychosocial problems as ADHD and substance abuse.

Since the National Institutes of Health classified addiction as a chronic relapsing biopsychosocial brain disease (Leshner, 1997), additional research on brain functioning and substance abuse has changed the way clinicians and researchers think and act. In addition, the World Health Organization issued a similar statement, classifying addiction as a brain disorder determined by biological and genetic factors and influenced by cultural and environmental factors (World Health Organization, 2004). Most previous attempts to develop a theory of substance abuse were mainly, if not exclusively, aimed at psychological and social factors, and often included non-empirical factors such as *personality* and *spirituality*. Because of the recent developments in neuroscience research and technological advances of the past decade (i.e., magnetic resonance imaging [MRI] and positron emission tomography [PET] scans), such theoretical models as psychodynamic theory or personality theory of substance dependence, although helpful in some instances, are no longer sufficient and may in fact inhibit understanding and appropriate treatment of this complex process. The more inclusive *person in environment* approach provides a more accurate reflection of the complexity of this biopsychosocial disease. Therefore, for this research, Bronfenbrenner's ecological model, which has the capacity to include the key research fields in substance abuse; biology, sociology and psychology, was selected as an organizing framework. Bronfenbrenner's framework is an excellent tool for capturing the various biopsychosocial elements that influence children and families, and thus it has provided an important social work perspective. The conceptual elements leading to the outcome of adult substance abuse that were examined were: childhood personality traits of ADHD, and drug use/abuse choice and pattern among inmates.

ADHD and Substance Abuse

The prevalence of childhood ADHD among adolescent and adult substance abusers is well documented (Biederman, Wilens, Mick, Faraone, Weber, Curtis, 1997; Horner & Scheibe, 1997; Manuzza, 1993; To, 2006). In Nigeria, Chinawa, Odetunde, Obu, Chinawa, Bakare and Ujunwa (2014), in a study on Attention Deficit Hyperactivity Disorder: A neglected issue in the developing world (Nigeria) reported a prevalence of 3.2 % in children. Exactly how ADHD and substance abuse are related, however, is not yet clear. Ongoing genetic research is attempting to find this link through exploration of the dopamine system (National Institute on Drug Abuse, 1999). Tunde-Ayinmode, Adegunloye and Abiodun (2012), suggested that the presence of severe child psychopathology such as ADHD is inherited from Maternal parenting distress which bring about associated functional impairment and subsequent substance use/abuse. Variability in prevalence across countries is subject to demographic and geographic factors (Rappley, 2005; Dopfner, Breuer, Wille, Erhart, Ravens, Sieberer, 2008). The complication of coexisting conduct disorder in childhood has also been shown to increase the likelihood of adult substance use disorder (SUD) (Biederman, Newcorn, & Sprich, 1991; Myers, Stewart, & Brown, 1998 Fischer, Barkley, Smallish, & Fletcher, 2002; Willcutt, 2012). Vulnerability of individuals with ADHD tendencies paced them at risk of deviant behaviours and drug abuse (Mannuza, & Klein, 2000).

The estimated rate of incidence of ADHD among youth in this country ranges from 7.4 % to 16.1%. (Ambuabunos, Ofovwe, & Ibadin, 2011). Treatment with stimulant medication remains the mainstay of drug treatment with prescribing rates estimated from 40.0% to 86.5% (Barbaresi, Katusic, Colligan, Pankratz, Weaver, Weber, 2002; Perry & Kuperman, 1996; Biederman, et al., 2005). Vulnerability to adult substance use problems has been documented in numerous studies with incidence rates ranging from 16% (Manuzza, 1993) to 52% (Biederman et al., 1995).

Anger and aggression are identified as early indicators of future SA problems and are also characteristics of ADHD. Conflicting results regarding the nature of this relationship have been reported. Molina and Pelham, (2003) identify the inattentive elements of childhood ADHD to have a stronger relationship to early onset of substance use behaviors than to the more antisocial behaviors, while others (Flory & Lynam, 2003) have suggested that controlling for the more aggressive impulsive dimensions of ADHD all but eliminates the relationship of ADHD to future substance use disorders. Matsumoto, Yamaguchi, Asami, Kamijo, Iseki, Hirayasu and Wada (2005) conducted a study on drug preferences in illicit drug abusers with a childhood tendency of attention deficit/ hyperactivity disorder: A study using the Wender Utah Rating Scale in a Japanese prison, where 413 prisoners without drug addiction and 282 prisoners with drug addiction (192 Methamphetamine, 53 Toluene, 37 Cannabis) were administered

a self-reporting instrument to retrospectively identify childhood tendencies of ADHD. WURS scores were compared between prisoners with and without a drug addiction, and between MAP, toluene and cannabis abusers. Prisoners with a drug addiction showed significantly higher WURS scores than those without the addiction ($p<0.001$). Toluene abusers showed significantly higher WURS scores than cannabis abusers ($p<0.001$), and included a higher proportion with scores over cut-off than MAP or cannabis abusers ($p=0.005$). They concluded that there is a close relationship existing between illicit drug abuse and childhood ADHD tendencies. Also drug abusers with ADHD tendencies were liable to choose MAP over other illicit drugs. This supports the explanation for ADHD susceptibility to heavy substance use.

A possible explanation for Methamphetamine high preference in terms of drug choice for those with ADHD tendency could be due to its high potency (clinically speculated) as a stimulant with self-medicating effects. This drug is also abuse by those without ADHD considering the fact that they are inactive and thus seeking an activating inducing drug which is a stimulant with such potentials (Matsumoto, et al 2004). Some ADHD individuals resorted to use a suppressant (toluene) due to its suppressing and sedating effects to achieve calmness, thereby becoming dependent (Matsumoto, et al 2004).

The purpose of this study was to identify risk factors for future substance abuse among inmates with ADHD tendencies and to further identify the differences in drug use choice and patterns of those with ADHD and non ADHD. This study analyzed data previously collected to address the following questions: 1) what risk factors predict Substance Abuse problems for inmates? 2) Do inmates with ADHD tendencies indulged in heavy substance use compared to those with non ADHD tendencies? 3) What are the differences in the choice of substances of abuse among inmates with and without ADHD tendencies?

METHODS

Design/ Instruments

The mixed method research design was used for the study. The qualitative data was analyzed using the phenomenological design. The quantitative data was analyzed using SPSS.

Data were gathered from prison inmates who were called upon based on the need of the interviewer (substance abuse). The participants firstly filled the questionnaires before the verbal interviews were conducted on a one on one basis. Pencils were shared to the participants to fill in the questionnaires.

A general instruction session was first delivered to all participants before the questionnaires were handed over to them. The participants first gathered in the psychology office which could house only about 15 inmates at a time, so they came into the room in badges.

At the end of the process of the

interview, the participants were appreciated with a package of toiletries and snack to improve their welfare.

The study adopted the 25items most informative Wender Utah Rating Scale. The WURS was developed as a self-reporting instrument for retrospective detection of childhood AD/HD cases in the absence of parental information. This instrument originally consisted of 61 items concerning various behaviour problems in childhood prior to graduation from elementary school; generally, the 25 items showing the greatest differences between patients with childhood AD/HD and a non-patient comparison group have been used. Each WURS question is answered by selecting from five possibilities: not at all or very slightly, mildly, moderately, quite a lot or very much. Ward *et al.* established the validity and availability of the WURS, and demonstrated that the total score correlated significantly with the score of the Parents' Rating Scale. Furthermore, they also demonstrated that a cut-off score of 36 or higher correctly identified 96% of adults with childhood AD/HD and 96%of normal control subjects, while acut-off score of 46 or higher correctly classified 86% of adults with childhood AD/HD, 81% of depressed patients without childhood AD/HD, and 99% of normal control subjects.

Participants

70 prison inmates were recruited into the study. The bases of their selection were those who had drug and crime related issues are either awaiting trial or convicted. The age range of the participants was 18 -60 with an average age and standard deviation of 30 (SD = 8.34) with male mean representation of 94.3% (66) and 5.7% for females (4). Informed consent was obtained from all participants.

RESULTS

A total of 70 inmates from Jos prison were recruited into the study. Table 1 shows the socio-demographic characteristics of participants.

Socio-demographic Characteristics of Participants

Table 1: Drug Use of Participants

Drugs	No		Once		Twice		Severally		Total	
	f	%	f	%	F	%	F	%	f	%
Alcohol	21	30.9	9	13.2	4	5.9	34	50.0	68	100.0
Cannabis (Herb or Resin)	28	40.6	5	7.2	8	11.6	28	40.6	69	100.0
Methamphetamine (Crystal or Powder)	58	82.9	4	5.7	5	7.1	3	4.3	70	100.0
Cocaine	57	81.4	2	2.9	5	7.1	6	8.6	70	100.0
Crack cocaine	57	81.4	3	4.3	1	1.4	9	12.9	70	100.0
Ecstasy	56	80.0	5	7.1	5	7.1	4	5.7	70	100.0
Tranquilizers (such as Bromazapan, valium)	63	90.0	2	2.9	2	2.9	3	4.3	70	100.0

Drugs	No		Once		Twice		Severally		Total	
	f	%	f	%	F	%	F	%	f	%
Raquinol	64	91.4	1	1.4	1	1.4	4	5.7	70	100.0
Heroin	61	87.1	2	2.9	6	8.6	1	1.4	70	100.0
LSD	59	84.3	5	7.1	3	4.3	3	4.3	70	100.0
PCP	62	88.6	2	2.9	2	2.9	4	5.7	70	100.0
Solvents/Inhalants (Glue)	55	78.6	3	4.3	4	5.7	8	11.4	70	100.0
Cough Syrup	39	55.7	4	5.7	10	14.3	17	24.3	70	100.0

The Table revealed that 66 (94.3%) of the participants were males; and the majority 60 (85.7%) were affiliated to the Christian religion. Regarding the marital status of participants, the majority 48 (71.6%) were single, and 14 (10%) were married. Furthermore, the Table revealed that 23 (33.8%) of the participants were first born as regards their birth position in their family, 24 (35.3%) were middle born, 20 (29.4%) were last born, and one participant was an only child. Data on the highest educational level of participants revealed that Majority 44 (63.8%) of the participants had secondary education; while a small 2 (2.9%) had no formal education. More so, regarding employment, 37 (54.4%) of the participants indicated that they were employed before now, while 31 (45.6%) indicated that they were not employed before now.

Drug Use of Participants

Table 1: shows the frequency of variant drug use by participants. The Table revealed that a ā34 (50%) of the participants use alcohol severally, 28 (40.6%) use cannabis severally, 3 (4.3%) use 2methamphetamine severally, 6 (8.6%) use cocaine severally, 9 (12.9%) use crack cocaine severally, 4 (5.7%) use ecstasy severally, 3 (4.3%) had used tranquilizers severally, 4 (5.7%) had used raquinol severally, one participant indicated having used heroin severally, 3 (4.3%) had used LSD severally, 4 (5.7%) had used PCP severally, while 8 (11.4%) of the participants had used solvents/inhalants severally, and 17 (24.3%) had used cough syrup severally.

Relationship between AD/HD and Drug Use of Participants was the first hypothesis testes. Table 2 shows the relationship between AD/HD and participants use of variant drugs. Results revealed that there was a significant relationship between AD/HD and methamphetamine (χ^2 = 12.323, p = 0.006), cocaine use (χ^2 = 12.712, p = 0.005), and crack cocaine (χ^2 = 13.899, p = 0.003). But there was no significant relationship between AD/HD and alcohol (p = 0.368), cannabis (p = 0.348), ecstasy (p = 0.245), tranquilizers (p = 0.053), raquinol (p = 0.259), heroine (p = 0.719), LSD (p = 0.738), LSD (p = 0.738), PCP (p = 0.136), solvents (p = 0.615), and cough syrup (p = 0.139).

Table 2: Relationship between AD/HD and Drug Use of Participants

Drugs	Chi-square (χ^2)	Df	p-value
Alcohol	3.155	3	0.368
Cannabis (Herb or Resin)	3.300	3	0.348
Methamphetamine (Crystal or Powder)	12.323	3	0.006
Cocaine	12.712	3	0.005
Crack cocaine	13.899	3	0.003
Ecstasy	4.154	3	0.245
Tranquilizers (such as Bromazapan, valium)	7.678	3	0.053
Raquinol	4.018	3	0.259
Heroin	1.344	3	0.719
LSD	1.261	3	0.738
PCP	5.553	3	0.136
Solvents/Inhalants (Glue)	1.800	3	0.615
Cough Syrup	5.493	3	0.139

H2 — A significant number inmates with ADHD will be heavy substance users compared with inmates without ADHD

Table 3: Mean Scores of Substance Use across ADHD

ADHD	Mean score on substance use	Standard deviation	95% Confidence Interval	
			Lower Bound	Upper Bound
Normal	6.08	4.82	4.13	8.03
Problematic	9.48	6.99	7.42	11.55

Results revealed that inmates with ADHD were significantly heavy substance users compared with inmates without ADHD, $F(1, 68) = 5.723$, $p = 0.020$ ($p<.05$) with mean substance use; scores of 6.08 (SD 4.82) for normal inmates, and 9.48 (SD 6.99) for ADHD inmates

DISCUSSION

Nigerian studies on ADHD were limited to schools and hospitals, hence necessitating the exploration of the prison. ADHD tendencies and drug choice is one study that has single out persistent risk factors from childhood to adulthood that is implicated in drug use choice and crime perpetration hence identifying developmental elements that predispose to heavy substance use and abuse and proffering solution to the associated risk

factors. Hypothesis one was significant and -supported byFlory & Lynam, (Tunde-Ayinmode et al, (2012) , ADHD tendencies have been found to predict substance use/abuse in adulthood, especially when risk factors involved deficiencies in low self-esteem, aggression, exposure to stimulants from childhood, self-medication, genetic factors, conduct disorder and persistent ADHD symptoms (Flory & Lynam, 2003 Tunde-Ayinmode et al, 2012). In situation where ADHD persisted to adulthood; implicated school dropout, occupational instability, social personality dysfunctions and heinous crime perpetrations should be anticipated.

From the qualitative session of interview, inmates admitted the perpetration of heinous crimes of all sort; murder, rape, fighting/aggression, aiding and abating crime, drug dealing and possessions, arson, impersonation, robbery, theft. The study revealed that significant number of the inmates had some level of formal education with few attaining the tertiary level in their academic pursuits but dropout due to flimsy/unjustifiable and criminal reasons.

Quite a number of them admitted been gainfully employed but lost it to inconsistency such as truancy and substance incriminating acts. Citing few of the respondents *" I am working in NNPC mega filling station then one man was fighting my friend and I saw him then I hit him and he died later in hospital and that day I took cough syrup and weewee". "I started drinking at the age of 22 it was some bad company that introduced me to it. I drank to get some kind of high and feeling on top of the world, gradually I grossly plunged into it and became addicted to it. "* Inmates with ADHD tendencies and non ADHD tendencies reported to have indulged in heavy use of substances with alcohol, cannabis and cough syrup having the highest prevalence.

There was also a relationship between ADHD tendencies and drug choice, findings on hypotheses 2 r!evealed that among inmates with substance related crimes, those with ADHD tendencies significantly abuse methamphetamine, cocaine and crack cocaine in high doses. However, there was no significant relationship between AD/HD and alcohol, cannabis, ecstasy, tranquilizer, raquinol, heroin, LSD, PCP, solvents, and cough syrup. This is in agreement with a similar study by Matsumoto et al (2005), who reported a correlation between high ADHD tendency scores and substance use among inmates in a Japanese prison. ADHD individuals abusing Methamphetamine are vulnerable to break down from the highness state and resultant psychiatric morbidity from the drug inducement.

Raquinol being a nondrug revealed the extent to which the inmates responded to the questions with high cognition.

CONCLUSION

No doubt the menace of alcohol and drugs continues to be one of the primary concerns of Families in Nigeria. Substance use manifest with enormous

effects in; complicated health consequences, heavy financial implications on drug related treatment, a truncated society's productivity and drop in output/man power. Early detection and continuous assessment of ADHD from childhood to adulthood should be instituted for early diagnosis and interventions. Similar routines should be extended to crime suspects before incarceration as a measure of reformation. Since medication treatment have high risk of substance abuse and transition to dependence, behavioural modifications should be most emphasized.

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