Gender differences in personality characteristics and cognitive abilities in adolescents admitted in correctional institutes in Egypt

Amany Ahmed Abdou, Dalal Amer and Mohamed Nasreldin Sadek

Faculty of Medicine, Cairo University, Cairo, Egypt

Correspondence to Amany Ahmed Abdou, Assistant Professor of Psychiatry, Faculty of Medicine, Cairo University, Cairo, Egypt Tel: + 0100 5214720; e-mail: amanyahmedabdou@yahoo.com

Received 1 July 2011 Accepted 22 August 2011

Egyptian Journal of Psychiatry 2012, 33:9-14

Objectives

To ascertain differences between male and female adolescents admitted to correctional institutes in Egypt with respect to their personality characteristics and cognitive abilities.

Methods

This cross-sectional study was carried out in two correctional institutes in Cairo. Fifty adolescents admitted after being convicted by court (25 male, 25 female) were randomly selected, assessed, and compared with an age-matched control group (N=25). Data on personal, sociodemographic, and criminal history were collected. They were subjected to the Wechsler Adult Intelligence Scale, the Wisconsin Card Sorting Test, the Eysenck Personality Questionnaire, The Hostility Questionnaire, and the Psychiatric Symptomatology Scale for adolescents.

Results

Of the students, 28% were male and 16% were female; 72% of male and 36% of female adolescents were working as unskilled manual workers. Male adolescents were more violent in their acts compared with female adolescents (48 vs. 8%); 12% of male adolescents were engaged in the use and sale of drugs compared with 8% of female adolescents; 44% of female adolescents were homeless compared with 4% of male adolescents; stress factors were mostly financial in male adolescents (88%), whereas in females sexual abuse was present in 24% in addition. Substance abuse was a dominant feature in both: 80% in male adolescents (nicotine smoking in 24% and polysubstance in 56%) and 64% in female adolescents (nicotine smoking in 44% and polysubstance in 20%). Adolescent girls had significantly higher scores in the adjustment disorder, identity disorder, and depression, bulimia, and sleep disorders on the symptomatology scale. They also had lower IQ in the total, verbal, performance, vocabulary, arithmetic, digit span, digit symbol, and block design scales of the Wechsler Adult Intelligence Scale. No significant difference was seen in the Eysenck Personality Questionnaire and in the Wisconsin Card Sorting Test.

Keywords:

adolescents, correctional institutes, personality characteristics and cognitive abilities, sex-related differences

Egypt J Psychiatr 33:9–14 © 2012 Egyptian Journal of Psychiatry 1110-1105

Introduction

Adolescent delinquency is an important public health problem; it varies from outright aggression to other antisocial behaviors such as steeling and vandalism. The National Center for Social and Criminal Studies (2002) showed a marked increase in delinquent behavior among adolescents; for example, school violence rate increased from 4.9% in 1995 to 5.5% in 2000. In addition, police reports for adolescent delinquency showed a significant increase in incidence from 1056 acts in 1991 through 2083 acts in 1997 to 3069 acts in 2001 (The National Center for Social and Criminal Studies, 2002).

In a recent report on adolescent crimes in Egypt, drugs constituted 72.5% of the majority of crimes committed in 2001, followed by carrying armed weapon in 14.4% and

crimes related to violence (murder, rape, battery leading to death, armed robbery, kidnapping, arson, etc.) constituting 11.3%. In contrast, 25% of all the children and adolescents arrested in Egypt in 2001 were arrested on the charge of being 'vulnerable to delinquency' (Ministry of Interior, Social Protection Sector, General Administration for Juvenile Welfare Investigation, 2002).

Male and female juvenile delinquents showed differences in behavioral, psychopathological, and familial risks, psychiatric perspective, and functional impairment.

Girls commit fewer and less serious offences and they are younger than detained boys when admitted to correctional institutes. Girls also experience greater incidences of physical, emotional, and sexual abuse, physical neglect, and family history of mental illness compared with their

1110-1105 © 2012 Egyptian Journal of Psychiatry

DOI: 10.7123/01.EJP.0000411074.34042.8e

Copyright © Egyptian Journal of Psychiatry. Unauthorized reproduction of this article is prohibited.

male counterparts. A relatively high percentage of mentally challenged girls were found among those admitted to correctional institutes (McCabe *et al.*, 2002).

Female offenders have more acute mental health symptoms and psychological disturbances than do male offenders (Espelage *et al.*, 2003).

In addition, multiple sexual contacts from an early age, substance abuse, running away from home, and truancy were found to be behaviors leading to risk of development of juvenile delinquency in girls (Lenssen *et al.*, 2000).

Aim of the work

This work aimed to find out the sex-related differences between adolescents admitted to correctional institutes in Egypt with respect to their personality characteristics and cognitive abilities, which may have implications in the management and choice of rehabilitation programs.

Participants and methods

This is a cross-sectional study. It was carried out in two correctional institutes in Cairo, one for boys (Ain Shams) and the other for girls (El Agouza), under the supervision of the Ministry of Social affairs after obtaining approval from the legal authority. These adolescents were admitted after being convicted by court following criminal or delinquent acts. Fifty juvenile delinquents (25 boys and 25 girls) were randomly selected, as we included the middle family and the older age group families in both institutes. The children were divided into families according to their ages. They were accused of a heterogenous group of crimes. Their personal, sociodemographic, and criminal histories were collected after interviewing them, the supervisors, and the social worker of each family and also from institution documents. All the adolescents included were willing to participate in the study. The few cases that refused were excluded.

They were subjected to the following:

- The Wechsler Adult Intelligence Scale Revised (WAIS-R) (the subscales and the verbal, performance, and total scores): Analysis of WAIS-R by its detailed subscales was carried out to assess different cognitive domains covered by the scale (Melikah and Ismael, 1967).
- (2) The Eysenck Personality Questionnaire: This questionnaire consists of psychoticism (P), neuroticism (N), extraversion (E), introversion (I), lie (L), and psychopathic deviation (PD) scales, in adult form (Abou Nahia, 1989).
- (3) The Psychiatric Symptomatology Scale, for adolescents and adults: It is a structured tool prepared according to the *Diagnostic and Statistical Manual of Mental Disorders* third edition-revised criteria and ICD-10 criteria. It consists of 150 questions, screening most of the psychiatric symptoms (27 symptoms) (Hamouda and Emam, 1996).

- (4) The Hostility Questionnaire: It consists of 51 questions, covering different aspects of hostility (overt, selfcriticism, other's criticism, paranoid aggression, guilt feelings, and the total score) (El Taieb, 1984).
- (5) The Wisconsin Card Sorting Test (WCST): It is a tool for recognizing frontal cortical dysfunction. It consists of 64 cards and four meaningless stimulus cards. These have to be sorted one at a time with these stimulus cards. The first principle is 'color,' the second is 'figure' or 'form,' the third is 'number' and so on. Thirteen indices were chosen for assessment (Heaton *et al.*, 1993).

NΒ

For all the previous tools we used the Arabic version, which was standardized and adapted to suit the Egyptian culture; their validity and reliability were proven. We used a control group (N=25) that was matched with the adolescent delinquent group in age only. The members of the control group were selected from educated volunteers from Kasr El Aini worker relatives. This was not for comparison, as in fact the adolescent delinquent group cannot be compared with any normal adolescent group because their characteristics will never simulate any normal adolescents in any aspect, such as socioeconomic status (SES), familial background, intelligence, education, psychiatric symptoms, hostility, etc. However, this comparison was helpful to compare the results of adolescent delinquents obtained from the different questionnaires with the results of age-matched normal adolescents so as to give us a true idea about the actual results and limitations.

Statistical methods

Data were computerized and analyzed using the software package SPSS (version 11 IBM, Armonk, New York, USA). Frequency distribution was used to describe the included participants on the basis of their qualitative parameters, whereas mean and SD + was used to describe the quantitative parameters. Differences between boys and girls among both cases and controls were explored using the χ^2 -test (when relevant) for qualitative data and using the Student *t*-test for quantitative data. Levels of significance in all statistical tests was considered at *P*<0.05.

Results

The total number of adolescent delinquents was 50; 25 were male (50%) and 25 were female (50%). The control (C) group consisted of 25 normal adolescents, of whom 15 were male (60%) and 10 were female (40%) (Table 1). Both groups were age matched, with no statistically significant difference between them. There was no significant difference in the SES between the groups; significant difference was observed in education and occupation. Twenty-eight percent of male adolescents; 72% of male versus 36% of female adolescents were working as unskilled manual workers (Table 2). Boys were admitted

Table 1 Sex difference in age

		Case	s (50)			Control (25)				
	Males (25)		Females (25)			Males (15)		Females (10)		
	Mean	SD	Mean	SD	Ρ	Mean	SD	Mean	SD	Ρ
Age	17.86	1.79	17.32	2.08	0.32	17.87	0.83	17.3	1.06	0.15

for a longer duration; they were more violent in their acts (48 vs. 8% of girls) (Table 3). Stress factors were mostly financial in boys (88%), whereas in girls sexual abuse was present in 24% (Table 4). Substance abuse was a dominant feature in both: 80% of boys (nicotine smoking in 24% and polysubstance in 56%) and 64% of girls (nicotine smoking in 44% and polysubstance in 20%) (Table 4). There was a statistically significant difference between male and female adolescents in the symptomatology scale; girls showed significantly higher scores in adjustment disorder, depression, identity disorder, bulimia, and sleep disorders. Adjustment disorder was present in 80% of girls versus 48% of boys; depression was present in 80% of girls versus 48% of boys; identity disorder was seen in 84% of girls versus 48% of boys; bulimia was present in 48% of girls versus 4% of boys; and sleep disorders and nightmares were found in 60% of girls versus 24% of boys. There was no statistically significant difference between male and female adolescents in the rest of the subscales of the symptomatology scale. Girls had significantly higher scores in the Hostility Questionnaire covering different aspects of hostility (overt, self-criticism, other's criticism, paranoid aggression, guilt feelings, and the total score) (Table 5). No significant difference was observed between the groups with respect to personality characteristics as measured by the Eysenck Personality Questionnaire in all the subscales: extraversion, neuroticism, psychoticism, and psychopathic deviation (Table 5). Girls had lower IQ in the total, verbal, performance, vocabulary, arithmetic,

Table 2	Sex	difference	in	sociodemographic	data
---------	-----	------------	----	------------------	------

	Males (N=25)	Females ($N=25$)	
	No. (%)	No. (%)	Р
Residence			
Urban	20 (80)	18 (72)	0.74
Rural	5 (20)	7 (28)	
Education			
Illiterate	5 (20)	4 (16)	
Primary	6 (24)	8 (32)	0.81
Preparatory	11 (44)	9 (36)	
Secondary	3 (12)	3 (12)	
University	0 (0)	1 (4)	
Occupation			
Not working	0 (0)	12 (48)	
Student	7 (28)	4 (16)	0.000**
Unskilled	18 (72)	9 (36)	
SES			
Very poor	8 (32)	15 (60)	
Below average	10 (40)	7 (28)	0.092
Average	7 (28)	2 (8)	
Above average	0 (0)	1 (4)	

SES, socioeconomic status.

*Highly significant.

Table 3	Sex	difference	in	legal	data
---------	-----	------------	----	-------	------

	Males (N=25)	Females ($N = 25$)	_
	No. (%)	No. (%)	Р
Type of confinement			
\leq 3 years	1 (4)	12 (48)	
5 years	5 (20)	9 (36)	0.000**
Open	19 (76)	4 (16)	
Accusation			
Nonviolent	9 (36)	10 (40)	
Violent	12 (48)	2 (8)	0.001*
Drug use or selling	3 (12)	2 (8)	
Homeless	1 (4)	11 (44)	
Description	.,	. ,	
Planned	1 (4)	11 (44)	
Impulsive	10 (40)	8 (32)	0.003*
Homeless	14 (56)	6 (24)	
Description		. ,	
Solitary	9 (36)	15 (60)	0.156
Group	16 (64)	10 (40)	

*Significant.

**Highly significant.

digit span, digit symbol, and block design scales of the WAIS (Table 6). No significant difference was observed between the groups with respect to cognitive abilities such as frontal lobe functions and mental flexibility as measured by WCST. No significant difference was observed between boys and girls in any of the subscales of WCST with regard to their frontal lobe functions and mental flexibility (Table 7).

Discussion

Sex-related differences among delinquent adolescents have implications on the choice of management plans applied in correctional institutes (Van Wijk *et al.*, 2007; Vincent *et al.*, 2008). In our work (Table 2) male and female juvenile adolescents showed no statistically significant difference with respect to residence, education, and SES. This was expected as poor social and

Table 4 Sex difference in clinical characteristics

	Males ($N=25$)	Females ($N=25$)	_
	No. (%)	No. (%)	Р
Stress factors			
Absent	3 (12)	3 (12)	
Social and financial	22 (88)	16 (64)	0.031*
Positive sexual abuse	0 (0)	6 (24)	
Family history			
Negative	15 (60)	14 (56)	1.000
Positive	10 (40)	11 (44)	
Self-injury			
Absent	19 (76)	18 (72)	0.36
Present	3 (12)	1 (4)	
Suicide	3 (12)	6 (24)	
Sexual practices			
Negative	15 (60)	13 (52)	0.85
Homosexual	5 (20)	6 (24)	
Heterosexual	5 (20)	6 (24)	
Substance abuse			
Negative	5 (20)	9 (36)	0.032*
Nicotine only	6 (24)	11 (44)	
Polysubstance	14 (56)	5 (20)	
*Significant.			

Copyright © Egyptian Journal of Psychiatry. Unauthorized reproduction of this article is prohibited.

		Case	es (50)					Control (25)			
	Males (25)		Females (25)			Males (15)		Females (10)			
	Mean	SD	Mean	SD	Р	Mean	SD	Mean	SD	Р	
EPQ											
E	14.08	5.28	12.96	4.95	0.44	10.87	2.83	10.5	2.72	0.75	
Ν	16.40	3.44	16.28	4.23	0.91	12.60	3.14	13	4.57	0.8	
Р	7.36	2.77	8.64	2.72	0.11	4.67	1.54	4	1.7	0.32	
L	9.84	2.54	8.48	2.77	0.08	9.00	2.34	8.7	1.25	0.70	
PD	15.32	2.59	15.24	2.38	0.91	7.27	1.98	5.8	1.81	0.07	
Total hostility	22.56	6.56	26.56	7.25	0.046*	22.2	7.25	16.22	7.41	0.065	

Table 5 Sex difference in personality characteristics (Eysenck Personality Questionnaire) and The Hostility Questionnaire

E, extraversion; EPQ, Eysenck Personality Questionnaire; L, lie; N, neuroticism; P, psychoticism; PD, psychopathic deviation. *Significant.

Table 6 Sex difference in intelligence

	Cases (50)									
	Males (25)		Females (25)			Males (15)		Females (10)		
	Mean	SD	Mean	SD	Р	Mean	SD	Mean	SD	Р
Total IQ	80.08	6.86	71.80	11.99	0.005*	102.33	3.811	101.50	2.64	0.53
Verbal IQ	76.80	7.04	68.56	10.57	0.002*	101.0	5.92	96.00	3.16	0.012*
Performance	85.08	9.37	78.52	14.38	0.063	102.32	2.58	102.50	1.58	0.84
Performance subscales										
Digit symbol	9.12	2.01	7.56	2.93	0.034*	11	0.85	11	1.05	1.00
Object assembly	7.36	2.71	7.12	2.89	0.763	9.67	0.49	10.50	1.58	0.14
Block design	7.68	2.34	5.72	2.11	0.003*	9.33	0.49	9.00	0.000	0.019*
Picture completion	8.28	1.37	8.36	2.89	0.901	13	0.85	13	0.000	1.000
Picture arrangement	8.12	2.13	7.92	2.72	0.774	11.67	0.49	10.5	1.58	0.047*
Verbal subscales										
Vocabulary	8.04	1.57	4.76	1.81	0.000*	10.67	0.49	9.5	0.53	0.000*
Similarities	6.28	1.49	6.52	2.69	0.699	11.67	0.98	11	1.05	0.128
Arithmetic	6.04	2.05	3.92	2.52	0.002*	9.33	1.76	8	0.000	0.011*
Digit span	8.44	2.24	5.56	3.12	0.001*	9.67	1.76	11.5	0.53	0.001*
Comprehension	8.52	2.45	7.64	3.17	0.278	13	0.85	11	1.05	0.000*
Information	4.40	1.12	4.28	1.95	0.791	10	0.85	12	0.000	0.000*

*Significant.

Table 7 Sex difference in The Wisconsin Card Sorting Test

	Cases (50)					Control (25)				
	Males (25)		Females (25)			Male	Males (15)		Females (10)	
	Mean	SD	Mean	SD	Р	Mean	SD	Mean	SD	Р
No. of trials administered	12.08	13.83	121.8	13.77	0.81	105	21.07	93.2	25.08	0.22
No. of categories completed	4.12	1.86	3.56	1.69	0.27	5.13	1.06	5.80	0.63	0.09
Total no. correct	74	12.6	73.48	13.19	0.89	77.8	8.95	73.00	14.45	0.31
Total no. of errors	47.5	17.68	51.24	20.62	0.50	38.6	16.77	15.80	8.65	0.001*
% Errors	38.7	12.66	40.8	14.92	0.60	30.8	10.19	16.50	5.86	0.001*
Perseverative responses	33	27.11	22.6	19.04	0.12	9.2	10.14	9.10	10.14	0.98
% Perseverative responses	25.96	21.13	19.0	16.55	0.20	7.8	8.52	10.50	13.12	0.54
Perseverative errors	25.04	17.84	26.6	15.48	0.74	21.93	10.55	11.30	7.10	0.011*
% Perseverative errors	20.04	13.62	21.16	11.78	0.76	13.47	6.10	6.7	5.03	0.008*
Nonperseverative errors	22.12	8.64	24.2	8.17	0.39	16.07	8.4	6.8	5.69	0.006*
% Nonperseverative errors	18.08	6.24	19.56	5.7	0.39	13.13	6.09	6.7	5.03	0.011*
Conceptual level response	55.84	15.13	52.88	16.34	0.51	65.47	10.9	66.3	10.08	0.85
% Conceptual level response	47.7	17.17	44.68	17.58	0.439	61.27	14.02	77.1	8.67	0.004*
Trial to complete the first set	18.40	12.04	16.56	9.12	0.545	16.4	10.66	13.9	6.44	0.51
Failure to maintain set	1.00	1.53	1.12	1.33	0.769	0.93	1.22	0.70	1.25	0.648

*Significant.

economic status affects male and female adolescents equally. Although more boys attend school as families tend to educate boys more than girls, it was not apparent in our work as boys have more tendency for truancy and drop out of school more. This agrees with the results found in the present study that showed that both male and female delinquents were from low SES (Van Wijk *et al.*, 2007; Townsend *et al.*, 2010) with more tendency for

Copyright © Egyptian Journal of Psychiatry. Unauthorized reproduction of this article is prohibited.

truancy in boys (Handwerk et al., 2006). Regarding occupation, there was a significant difference, as 72% of boys were working as unskilled manual workers versus 36% of girls, as many children who terminate their education because of deviant behavior work as unskilled manual workers, which is the most fitting work for their skills. The reverse is also true, as many children whose low SES force them to work early in their life will be subjected to more stress factors, physical and sexual abuse, and early substance availability and use, making them more vulnerable to delinquency (Faied, 2002). Our culture accepts the phenomenon of early occupation in children because of poverty, which is rejected and forbidden in developed countries. The boys tend to work in workshops, whereas girls work as housemaids (Faied, 2002; Nasr, 2002). A statistically significant difference between male and female adolescents was noted (Table 3) regarding their legal data, as 76% of male adolescents received open admission until they reached 21 years of age, 20% for 5 years, and only 4% for 3 years (i.e. boys were admitted for longer duration). In contrast, only 16% of girls received open admission until they reached 21 years of age, 36% for 5 years, and 48% for 3 years (i.e. girls were admitted for shorter duration). Violent acts (e.g. murder, rape, battery leading to death, armed robbery, kidnapping, arson) were seen in 48% of boys versus 8% of girls, drug use or selling was seen in 12% of boys versus 8% of girls, and homelessness constituted 44% in girls versus 4% in boys. Planned acts were observed in 44% of girls versus 4% of boys, whereas impulsive acts were 40% in boys versus 32% in girls; this agrees with most of the previous studies (Abdou, 2005; Sadeq, 2005; Townsend et al., 2010). There was a statistically significant difference between male and female adolescents (Table 4) with regard to the presence of stress factors. Eighty-eight percent of boys were exposed to social and financial stress compared with 64% of girls; 24% of girls were additionally exposed to sexual abuse. This result agreed with previous studies (Faied, 2002; Nasr, 2002; Van Wijk et al., 2007) that found that girls experienced greater incidence of physical, emotional, and sexual abuse. It was obvious during the interview, as 20% of girls refused to leave the institute and asked for readmission at the end of their stay to escape from their very traumatizing family environment. Substance abuse showed a statistically significant difference between male and female delinquent adolescents; it reached 80% in boys, whereas it was 64% in girls. Nicotine use alone was 24% in boys and 44% in girls, whereas polysubstance abuse was 56% in boys and 20% in girls (cannabis, benzodiazepines, volatile substances, and alcohol were the most commonly used) (Table 4). The comorbidity of substance abuse and delinquency is a worldwide phenomenon. Most of the studies found more incidence of polysubstance abuse in boys than in girls, in agreement with previous Egyptian studies (Abdou, 2005; Sadeq, 2005; Amer, 2007). This is in contrast to the study (McCabe et al., 2002) that found no sex-related differences regarding comorbid substance abuse between boys and girls among adolescent delinquents, which could be explained by the different sample sizes. Delinquent

girls had statistically significant higher scores on the symptomatology scale with regard to adjustment disorder, depression, identity disorder, bulimia, and sleep disorders. These results agreed with previous studies that found that girls had higher rates of depression, hopelessness, negative self-evaluation, and suicide ideation scores (McClelland et al., 2004; Ogden and Amlund Hagen, 2009). It is important to mention that depression may not be just a comorbid symptom, or a result of their condition. It may be a cause, as in many cases the disruptive behavior in children and adolescents may be an expression of their depression and anxiety in an atypical form (Abram et al., 2008). This is in contrast to the study by McCabe et al. (2002) that found no sex-related differences in comorbid symptoms between boys and girls among adolescent delinquents. In this study, personality characteristics (Table 5) showed no significant difference between boys and girls in all subscales of the Eysenck Personality Questionnaire (extraversion, neuroticism, psychoticism, and psychopathic deviation), although significant differences between the study group and control group regarding personality characteristics using the EPO (extraversion, neuroticism, and psychoticism scales, and psychopathic deviation) were reported in previous studies (Abdou, 2005; Sadeq, 2005; Amer, 2007). This is considered as a disease-specific finding rather than sex specific; that is, it is related to the delinquent behavior itself (impulsiveness, aggression, psychopathic deviation, extraversion, neuroticism, and psychoticism) and not to the sex of the offender (Table 5). These results also agreed with the studies (McCabe et al., 2002; Espelage et al., 2003) that found no significant difference in the personality profile except for the psychopathic deviation scale, which was more elevated in boys than in girls (Vincent et al., 2008). On the contrary, delinquent girls showed statistically significantly higher scores in the Hostility Questionnaire covering different aspects of hostility, which may be explained by the fact that female delinquents tend to use hostility as a form of defense mechanism to reduce their psychological pain. Girls scored lower than boys (Table 6) with respect to total, verbal, and performance IQ. This may be explained by the fact that girls are less educated in our culture as poor families are less likely to send their girls to school and to continue education. In addition, low IQ is one of the risk factors among girls for early delinquency, running away from school, sexual abuse, and substance abuse (Ministry of Interior, Social Protection Sector, General Administration for Juvenile Welfare Investigation, 2001). Although delinquent girls scored higher than boys along the different subscales of hostility, namely, overt hostility, self-criticism, other's criticism, paranoid aggression, and guilt feelings, the percentage of boys who received open admission was significantly more than that of girls as they committed more violent and serious crimes requiring higher IQ. On analyzing the subscales of WAIS-R in detail to assess different cognitive domains, it was seen that girls also scored lower than boys in general vocabulary normally available to growing individuals in the society, which might be an indicator of the mental abilities and awareness of the surrounding world, reflecting lower verbal abilities stemming from lower IQ and lower cultural and educational level. The arithmetic subscale, in addition of assessing arithmetic abilities, assesses immediate memory, concentration, and conceptual manipulation, reflecting lower conceptual abilities and attention span in girls, which is matched with their lower IQ and lower educational level. With regard to digit span subscale assessing attention and immediate memory, girls scored lower than boys, reflecting their shorter attention span and distractibility. Although no significant difference was noted when comparing attention deficit hyperactivity disorder using the symptomatology scale, girls showed higher depression and anxiety symptoms, which might have an impact on performance. Digit symbol assesses visuo-motor coordination. Delinquent girls scored significantly lower than boys. The scores of this scale are affected by the speed and accuracy of performance, which is affected by attention deficit and anxiety levels, both of which were high among girls. The block design subscale assesses visuo-constructive abilities, especially spatial perception and nonverbal concept formation. In this study, performance of delinquent girls was significantly lower than that of boys, reflecting more impairment of visuo-spatial abilities. However, the results of this test could be affected by interests and motivation. The higher depression and anxiety seen in the female delinquent group might have had an impact on the results. No significant difference was observed between boys and girls in any of the subscales of the WCST (Table 7) measuring their frontal lobe functions and mental flexibility. This may be explained by the fact that this pathology in brain functioning is disease specific rather than sex related, as in the previous study (Sadeq, 2005). Examining the cognitive functions in adolescent delinquents using the same tool, it was found that the delinquent adolescent group had higher scores in all items of the WCST as compared with the control group.

Conclusion and recommendations

Male delinquents were more violent in their acts. Financial stress factors were higher in boys, whereas girls were exposed to sexual abuse as well.

Substance abuse was a dominant feature in both (nicotine smoking and polysubstance abuse). Girls had significantly higher scores on the adjustment disorder, identity disorder, depression, bulimia, and sleep disorders.

Girls were significantly hostile in all different aspects of hostility (overt, self-criticism, other's criticism, paranoid aggression, guilt feelings, and the total score). Personality characteristics showed no significant difference in any of the subscales: extraversion, neuroticism, psychoticism, and psychopathic deviation.

Girls had lower IQ, verbal, and performance scores. Vocabulary, arithmetic, digit span, digit symbol, and block design scales of the WAIS were lower in girls. No significant difference was observed between boys and girls in the WCST in any of the subscales. Management plans and rehabilitation programs for adolescents admitted to correctional institutes should be tailored according to each individual's circumstances, symptoms, abilities, and personality characteristics, and sex appropriate treatment should be focused upon and not according to general concepts and predetermined ideas.

Acknowledgements

Conflicts of interest

There are no conflicts of interest.

References

- Abdou AA (2005). Psychiatric assessment of juvenile delinquents admitted in correctional institutes in Egypt: correlation between psychiatric morbidity: hostility and emotional intelligence. Kasr EL-Aini Med J 11:311–324.
- Abou Nahia SE (1989). Eysenck personality questionnaire, Arabic version. Cairo: Dar El Nahda El Massria.
- Abram KM, Choe JY, Washburn JJ, Teplin LA, King DC, Dulcan MK (2008). Suicidal ideation and behaviors among youths in juvenile detention. J Am Acad Child Adolesc Psychiatry 47:291–300.
- Amer DA (2007). Psychopathological profile of juveniles admitted to correctional institutes in Egypt. Egypt J Psychiatry 26:131–143.
- El Taieb MA (1984). Hostility Questionnaire and its direction. Cairo: Dar El Maaref.
- Espelage DL, Cauffman E, Broidy L, Piquero AR, Mazerolle P, Steiner H (2003). A cluster-analytic investigation of MMPI profiles of serious male and female juvenile offenders. J Am Acad Child Adolesc Psychiatry 42:770–777.
- Faied S (2002). Psychological characteristics of violent offenders, study of a sample of juvenile delinquents. A Paper Presented in the 4th Annual Conference, The National Center for Social and Criminal studies, Cairo, Egypt.
- Hamouda MA, Emam EA (1996). *Psychiatric morbidity scale*. Cairo: Dar El Fekr El Arabi.
- Handwerk ML, Clopton K, Huefner JC, Smith GL, Hoff KE, Lucas CP (2006). Gender differences in adolescents in residential treatment. Am J Orthop 76:312–324.
- Heaton RK, Talley JL, Chelune GJ, Grant DA, Berg EA (1993). Wisconsin Card Sorting Test (WCST). Psychol Assess Resources.
- Lenssen SA, Doreleijers TA, Van Dijk ME, Hartman CA (2000). Girls in detention: what are their characteristics? A project to explore and document the character of this target group and the significant ways in which it differs from one consisting of boys. J Adolesc 23:287–303.
- McCabe KM, Lansing AE, Garland A, Hough R (2002). Gender differences in psychopathology, functional impairment and familial risk factors among adjudicated delinquents. J Am Acad Child Adolesc Psychiatry 41:860–867.
- McClelland GM, Elkington KS, Teplin LA, Abram KM (2004). Multiple substance use disorders in juvenile detainees. J Am Acad Child Adolesc Psychiatry 43:1215–1224.
- Melikah LK, Ismael ME (1967). Wechsler-Bellevue adult intelligence scale. Cairo: Dar El Nahda El Massria.
- Ministry of Interior, Social Protection Sector, General Administration for Juvenile Welfare Investigation (2001). *The administration's efforts year 2000*. Cairo: Ministry of Interior.
- Ministry of Interior, Social Protection Sector, General Administration for Juvenile Welfare Investigation (2002). *The administration's efforts year 2001*. Cairo: Ministry of Interior.
- Nasr S (2002). Relation between the violence severity and personality characteristics. A Paper Presented in the 4th Annual Conference, The National Center for Social and Criminal studies, Cairo, Egypt.
- Ogden T, Amlund Hagen K (2009). What works for whom? Gender differences in intake characteristics and treatment outcomes following multisystemic therapy. J Adolesc 32:1425–1435.
- Sadeq MN (2005). Cognitive dysfunction in juvenile delinquent admitted in correctional institutes in Egypt. Kasr EL-Aini Med J 11:325–343.
- The National Center for Social and Criminal Studies. The 4th Annual Conference Criminal and Social Dimensions for Violence in the Egyptian Culture. The National Center for Social and Criminal Studies, Cairo.
- Townsend E, Walker DM, Sargeant S, Vostanis P, Hawton K, Stocker O, *et al.* (2010). Systematic review and meta-analysis of interventions relevant for young offenders with mood disorders, anxiety disorders or self-harm. J Adolesc 33:9–20.
- Van Wijk AP, Blokland AAJ, Duits N, Vermeiren R, Harkink J (2007). Relating psychiatric disorders, offender and offence characteristics in a sample of adolescent sex offenders and non-sex offenders. Crim Behav Ment Health 17:15–30.
- Vincent GM, Grisso T, Terry A, Banks S (2008). Sex and race differences in mental health symptoms in juvenile justice: the MAYSI-2 national metaanalysis. J Am Acad Child Adolesc Psychiatry 47:282–290.