Asian Criminology (2017) 12:255–280
DOI 10.1007/s11417-017-9249-6

Roles of Psychopathic Personality, Mental Health, and Recidivism in Criminal Behavior: Survey of Brunei Inmates

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Received: 22 January 2015 / Accepted: 6 March 2017 / Published online: 27 March 2017

Abstract The survey investigated the contributions of sociodemographics, psychopathic personality, mental health, and recidivism to criminal behavior in a random sample of 64 Brunei convicts representing both genders. Participants committed five major types of crime related to stealing, drugs, sex, violence, and deception. Hierarchical multiple regression analysis revealed gender, age, the inmates' marital status and marital status of the inmates' parents as significant demographic predictors of criminality. Multinomial logistic regression analysis identified the demographic, psychopathic, and mental health variables that were related to committing the specific crimes. Significant psychopathic predictors were interpersonal and affective (stealing-related offenses), interpersonal and affective (drug crimes), interpersonal (sex offenders), and interpersonal (violent/ aggressive felonies). The best mental health predictors included: depression and psychoticism (stealing-related offenses); depression, hostility, and psychoticism (drug crimes); psychoticism (sex offenses); and depression, paranoid ideation, and psychoticism (violence/aggression). Binary logistic regression analysis showed male gender and inmates with married parents as the main predictors of recidivism (while other variables with high odds for re-offending included age-group 30–35, inmates with primary education, affective, lifestyle, antisocial, interpersonal sensitivity, depression, paranoid ideation, and psychoticism). Future research which incorporates interviews with probes and appropriate interventions to address crimes were recommended.

Keywords Crimes · Psychopathic personality · Mental health · Recidivism · Brunei

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Abbreviations

UBD *Universiti Brunei Darussalam*
SPSS Statistical Package for Social Sciences
OR Odds ratio

Introduction, Background, and Setting

The Sultanate of Brunei Darussalam, duped "the abode of peace" for its relative calm, is a small country on the Borneo island, Southeast Asia (surrounded by Indonesia, Malaysia, and the South China Sea), with a land mass of about 5765 km^2 and 393,372 people according to the 2011 population census (Department of Economic Planning and Development 2016). Quoting the Department of Economic Planning and Development's (2015) biannual report titled *Brunei Darussalam—Key Indicators 2014 (half year)*, Bandial (2015) stated that the crime rate increased in Brunei by 8% between 2011 and 2013. According to this report, there were 6442 recorded criminal cases in 2013, compared to 5889 in 2012 and 5927 (2011). The report described crime against property (theft) as the most prevalent type of offense, recording 3545 cases in 2013, up by 25% from 2011 (Bandial 2015). In addition, the report also said drug offenses increased by 7% over the same period, with 360 cases registered in 2013 (Bandial 2015). The 2014 government report estimated the crime rate in Brunei to be at 16 cases per population of 1000 (Bandial 2015). At the time of collecting data for the present study in 2013, the country had three prison facilities for convicted adult offenders, two correctional centers for juveniles with antisocial behaviors and a bureau for narcotics. Despite the large number of recorded and registered criminal cases, official government statistics indicated that there were only 266 inmates in 2009, 312 (2010), and 336 (2011) according to the Prison Department (2009, 2010, 2012). The Prison Department's (2012) report ranked road traffic, theft, and drug offenses as the first, second, and third highest crimes, respectively. The low conviction rate suggested that some of many recorded and registered cases might have been minor crimes (most of them settled out of court). In addition, criminal cases involving minors below 18 years of age cannot be incarcerated according to Brunei laws but referred to youth (juvenile) correctional centers for rehabilitation. Furthermore, some cases take long to process in courts of law. We assessed the inmates of Brunei in terms of their psychopathic personality, mental health, and recidivism patterns.

General Factors that Contribute to Offending

Psychopathic personality, mental health, and criminal recidivism are not the only factors leading to offending behavior. There is empirical evidence indicating that social environment, upbringing factors, poverty, and disadvantaged neighborhoods contribute to criminality in different ways. In their meta-analysis study, Leschied et al. (2008) identified a number of family, childhood, and adolescent factors that have links with criminal behaviors. According to these researchers, the family predictors of criminality included negative parenting practices such as coerciveness, authoritarianism, lack of child supervision, family violence or inter-parental conflict, and poor communication. However, Farrington (1991) found that the majority of criminal children also had a criminal father. In a later study, Farrington et al. (2006) found 53% of the men with a criminal conviction also had a convicted family member. The main childhood and adolescent predictors of criminal behavior include aggression

(Leschied et al. 2008), interpersonal hostility (Walters 2005), family offending history (Maniadaki and Kakouros 2008), and peer group pressure and bullying (Farrington and Ttofi 2011). Carroll et al. (1997) found that delinquent and at-risk adolescents attached significantly more importance to goals associated with developing a social image (e.g., freedom-autonomy) whereas not at-risk adolescents were more concerned with goals associated with an academic image (e.g., educational achievement). The other social factors contributing to criminal behavior included peer influence (Kosten et al. 2012) as well as impulsivity and school misconduct (Vogel and Barton 2011).

Psychopathic Tendencies and Criminal Behavior

Among the many correlates to criminal behavior at the individual level, psychopathy (tendency to have no remorse, no compassion, and no empathy) has been singled out by literature in previous studies as a major contributing factor (see Hare and Jutai 1983; Hare and McPherson 1984; Hare 1986; and Loucks and Zamble 1994). When examining the predictive power of various variables to criminality, Loucks and Wuerscher (1984) and Loucks and Zamble (1994) found that psychopathy, previous criminal convictions or recidivism, and substance abuse by the father made the highest significant contributions. In all these studies, psychopathy remained as the most important predictive variable at all times. One of the the good instruments that measure psychopathy is the Psychopathy Checklist—Revised edition (PCL-R) (Hare 2003). Declercq et al. (2012) found that the interpersonal subscale of the PCL-R (Hare 2003) was positively related with predatory violence. These researchers claimed that this association made sense considering that the psychopaths' interactions with others were defined by gradients of power and control and narcissistic gratification rather than by attachment patterns. The researchers concluded that predatory violence was related to the personality traits of psychopathy rather than to its lifestyle and antisocial characteristics. Hare (as quoted in Legge et al. 2005) also found that people with psychopathic personality tended to be overrepresented in prison populations of violent offenders. However, not all psychopaths are criminals and some researchers doubt if antisocial personality disorder (APD) was a component of psychopathy (see Skeem and Cooke 2010). Although most adult offenders with psychopathy meet criteria for antisocial personality disorder, only about 30% of those with antisocial personality disorder have psychopathy (Hart and Hare 1997; Dolan and Doyle 2007). In other words, APD was more prevalent in criminal behavior than psychopathy while psychopathy tended to be associated with greater and more severe offenses such as serial killing (Sarkar et al. 2011). The relationship between APD and psychopathy has lately become a contentious and controversial theoretical debate. For example, recent researchers on criminality such as Skeem and Cooke (2010) prefer to view criminal behavior (e.g., APD) as merely a correlate, rather than a component, of psychopathy. Furthermore, in their study of criminal recidivism, Zara and Farrington (2015) point out that a small number of persistent or repeat offenders, who include psychopaths, commit the majority of crimes. On the other hand, Hare and Neumann (2010) insist that antisociality was a part of the psychopathy construct and consider the arguements advanced by Skeem and Cooke (2010) as not convincing.

Mental Health and Criminal Behavior

Besides psychopathy, mental health is one of the other risk factors repeatedly implicated in criminal behavior (see Hayes and O'Reilly 2013). Numerous instruments that effectively

assess mental health are available and include the Symptom Checklist-90-R (SCL-90-R) (Derogatis 1994). In a nationwide sample of 593 homicide offenders, Laajasalo and Häkkänen (2004) found that 21 had at least one mental disorder such as obsessive–compulsiveness. Other previous studies have also implicated mental health in people with criminal activities (e.g., Rasmussen and Levander 1996; Fazel and Danesh 2002). In addition, research suggests that there is a relationship between mental health and psychopathy. For instance, PCL-R (Hare 2003) total scores were positively correlated with the psychopathic deviate and hypomania subscales of the Minnesota Multiphasic Personality Inventory—Revised edition (MMPI-2, Hathaway and McKinley 1989). Furthermore, the PCL-R total scores were also positively correlated with the antisocial, narcissistic, passive–aggressive, paranoid, and substance dependence subscales of the Millon Clinical Multiaxial Inventory—Revised edition (MCMI-II, Millon et al. 1997; Hare 2003). Moreover, research has established the association between neuroticism, psychoticism, addiction, and criminality measured by the revised Eysenck Personality Questionnaire subscales (EPQ-R, Eysenck and Eysenck 1975; Eysenck 1977) with factor 2 (lifestyle and antisocial subscales) of the revised Psychopathy Checklist, PCL-R (Hare 2003). Previous research shows that people with APD and psychopathy were significantly overrepresented among violent offenders (Rasmussen and Levander 1996; Fazel and Danesh 2002). Research evidence indicated that some personality disorders (e.g., anxious–avoidant and obsessive–compulsive) were relatively common among sexual offenders (Leue et al. 2004), especially pedophiles (Cohen and Galynker 2002), and offenders with paraphilia (Dunsieth et al. 2004).

Inmates' Criminal Recidivism

A recidivist inmate is a repeat offender who re-committed an offense within 1 year of release from prison (Prison Department 2012). On the other hand, Hare (2003) defines recidivism as a crime avoidance rate and ability to stay out of prison. Ex-convicts may be re-incarcerated if they perpetrate either the same offense (called specific recidivism) or the different offenses (referred to as general recidivism). In this way, we can have one time, second time, or multiple offenders and recidivism becomes an index of criminality. Recidivism also serves as an indicator of the effectiveness of the in-prison re-education, re-training, and counseling interventions as well as the suitability and success of the out-of-prison re-integration programs (LeClair 1988; Sherman et al. 1998; Harrison and Schehr 2004; Aba-Afari 2011). Studies by Lipsey (1992) and Home Office Research Study 171 (1997) found high numbers of reoffending and reconviction among young convicts who did not receive rehabilitation intervention while in prison or in the community compared to those who received such help. The fewer ex-convicts return to prison, the better and safer the community. General recidivism statistics provided by the Prison Department (2009, 2010, 2012) showed that there were 93, 96, and 86 recidivist offenders in Brunei prisons in 2009, 2010, and 2011, respectively. Several policy actions may help address the recidivism problem in Brunei. For example, the Sex Offender Treatment Program (SOTP) discussed by Ho and Ross (2012) appears to be relevant for use. Similarly, the crime prevention strategies described by Harrower (2001) were also applicable. Brunei also has a punitive Misuse of Drugs Act (MDA) legislation that is intended to deter drug crimes in the country. Similar drug-related laws have been enacted and enforced by all of Brunei's neighboring countries (see Leechaianan and Longmire 2013). Recently in 2013, Brunei introduced the Syariah Penal Code partly to help

contain the crime rate (see discussions on Syariah law by Rahman 2014; Minister of Religious Affairs 2014). Syariah law has severe punishments for stealing and sex offenses such as adulterly, but the penal code will only apply to the Muslim majority in the country. With no research available, the effectiveness and success of both the MDA law and Syariah Penal Code were not known.

Objectives of the Study

Crime in Brunei and inmates in Brunei prisons are two inter-related and under researched issues to which researchers need to direct more attention, priority, and effort. The literature in "General Factors that Contribute to Offending" to "The Inmates' Criminal Recidivism" shows that crime is caused by numerous factors and often requires diverse solutions to address it. Although the prevalence rate for crime is still relatively low in Brunei compared to other countries in the Southeast Asia region, there is an increasing felt need to prevent and reduce it. Both the funding of the present study by a government agency and the government's recent introduction of the Islamic Syariah law in the country underscore the Sultanate's concern to combat crime and protect the people by improving security and safety in the nation. The broad aim or purpose of the current study was to identify the demographic characteristics, psychopathic behaviors, and mental health factors that maintain criminality in our research participants. Our specific research objectives were to

1. Identify the broad types of crime committed by the participants
2. Determine the relationship between psychopathic personality (PCL-R subscales) and mental health disorders (SCL-90-R subscales)
3. Determine the relationship between demographic variables, psychopathic personality (PCL-R subscales), and mental health disorders (SCL-90-R subscales) with criminality (types of crime committed)
4. Determine the relationship between demographic variables, psychopathic personality (PCL-R subscales), and mental health disorders (SCL-90-R subscales) with criminal recidivism (re-offending trends)

Methods

We describe below under separate subheadings the methodology adopted in conducting the present study.

Design

We investigated the problem using the field survey approach. This strategy required the researchers to go to the selected prison to collect the data directly from the chosen inmates. The rationale and justification for using this design was that it permitted the researchers to administer the instruments to participants under tight security via interview as inmates were not allowed to have in the data collection room or cell a table, pencil, and paper to write on. This particular design also allowed the researchers to involve as many convicts as possible in the study. The field survey method was thus different from other forms of survey research such as the postal, online, and telephone surveys.

Participants

At the time of conducting the current study in 2013, information was not available about the total number of inmates in all the three prisons in Brunei, vital data that could be used as a sampling frame. Nevertheless, using the simple random sampling technique, we selected one of the three prisons in Brunei for our study. Although the chosen facility had more than 200 admitted persons, only 79 were actually convicted individuals at the time of collecting data for the present study. However, not all the 79 inmates were eligible to participate in the study. Our four-point inclusion criteria required us to select only those people who met the following conditions: (1) be one of the two conventional genders accepted in Brunei, male or female; (2) convicted by a court of law for the first time or more than once; (3) full Brunei citizen or permanent resident; and (4) willingly volunteering to be involved in the study. No other inclusion and exclusion criteria were applied besides these. Determining the appropriate sample size for a study requires the use of either a formula such the ones employed by Yamane (1967) and Chand et al. (2012) or a table of population values and corresponding sample sizes like the one developed by Krejcie and Morgan (1970). Neither of these was used in the current study, since we engaged all the eligible inmates in one randomly selected prison who met the inclusion criteria. From the 79 eligible prisoners, 64 (81%) met the inclusion criteria and were recruited into the present study. Since the population of interest to whom the results of the current could be generalized was 79, a moderate random sample of 64 was considered to be sufficient for our study according to the population and sample size table of Krejcie and Morgan (1970). However, in a few of our statistical analyses tables, the sample size fails to reach $N = 64$ due to either listwise or pairwise deletion by Statistical Package for Social Sciences (SPSS) of cases with missing values. Table 1 shows the demographic characteristics of our participants by type of crime committed.

Instruments

Data for the present study were collected using three different instruments: (1) a demographic questionnaire constructed by the researchers; (2) the Psychopathy Checklist-Revised edition, PCL-R (Hare 2003); and (3) the SCL-90-R (Derogatis 1994). Each of these is briefly explained in the following sections.

Demographic Questionnaire

Demographic data were collected by interview as inmates were not allowed to have a table, pen, and paper on which to write the responses in the data collection room. The interview schedule (with probes) that collected demographical information was constructed by the researchers based on the review of the relevant literature. The biodata collected included gender, age, educational level, the prisoner's marital status before imprisonment, the prisoner's employment status prior to incarceration, marital status for parents of inmates, the prisoner's frequency of imprisonment (repeat offending or criminal recidivism), and type of crime committed. For ethical reasons, we deliberately left out sensitive and contentious variables such as ethnicity and religion. Some of the items in the demographic questionnaire were dichotomous (e.g., gender) while others were multicategorical (e.g., age-groups had four categories while criminality or type of crimes committed had five categories). Four of the five researchers who conducted the present study were Brunei Malays and spoke Bahasa Melayu as

a native language as well as English as a second language. The fifth researcher was a foreigner and spoke only English. The demographic instrument was originally written by all the researchers in English language. Then, two of the Brunei nationals on the research team translated the biodata questionnaire forward to Bahasa Melayu, the main and official language of Brunei Darussalam spoken by the majority of the people. The other two bilingual Malay lecturers on the research team translated the demographic instrument backward to English language. The two copies of the personal information schedule were then compared in terms of contents and clarity of expression. The back translators were satisfied that the translated copy was equivalent to its original English counterpart. The translated biodata instrument was eventually administered via interview by two trained male prison officers who were also Brunei Malays and native speakers of Bahasa Melayu. The use of prison officers with whom participants were used to as data collectors and collection of data in the prisoners' regular jail environment were intended to ensure ecological validity and reduce the participants' level of being cautious, defensive, and apprehensive during the assessment. The Kappa inter-coder agreement reliability coefficient for the translated demographic questionnaire that was used in data collection was 0.930. The findings from the biodata instrument were translated to English by the bilingual members of the research team and are presented in Table 1.

Psychopathy Checklist—Revised Edition

To evaluate the participants' psychopathic personality, we used the PCL-R (Hare 2003). This is a 20-item paper-and-pencil scale whose three-point Likert-type response formats range from "no" (scored as 0), to "maybe" (1), and "yes" (2). The 20 items are divided into four facets or subscales known as interpersonal (four items), affective (four items), lifestyle (five items), and antisocial (five items). Two items do not belong to any facet but load high on all four subscales and were excluded from the study. The PCL-R measures a form of antisocial behavior known as psychopathy. However, not all psychopaths are criminals (Skeem and Cooke 2010). The same members of the research team who translated the demographical questionnaire forward and backward also independently provided the same services on the PCL-R instrument. The two versions of the PCL-R (original in English and translation in Bahasa Melayu) were then compared to determine their equivalence in clarity of expression and conceptual representation of contents in items. Once the two instrument editions were deemed by translators as adequately similar, the same trained prison officials who administered the demographic questionnaire in Bahasa Melayu language also administered the PCL-R in Malay via interview within the prison. The Kappa inter-coder agreement reliability coefficient for the translated PCL-R scale that was used in data collection was 0.881. The findings from the Malay version PCL-R were translated to English by the bilingual members of the research team. The descriptive statistics and reliability indices from the Malay PCL-R are presented in Table 2. As noted from this table, all the subscales of the PCL-R were reliable for use with our prison sample in Brunei.

Symptoms Checklist-90-Revised Edition

The SCL-90-R (Derogatis 1994) inventory is a mental health test designed to assess the psychological symptom pattern of the respondent. It is a screening device for measuring mental status (Osterberg et al. 2002). The scale measures nine primary areas or symptom dimensions of psychological distress (somatization, obsessive–compulsive, interpersonal

Table 1 The participants' demographic information by type of crime perpetrated ($N = 64$)

Variable	Broad types of offenses committed					Total
	Stealing[a] $n = 38$	Drugs[b] $n = 9$	Sex[c] $n = 7$	Violence[d] $n = 5$	Deception[e] $n = 5$	
Gender						
Males	36	8	5	4	5	58 (91%)
Females	2	1	2	1	0	6 (9%)
Age						
Age-group 18–23	10	1	2	1	0	14 (22%)
Age-group 24–29	13	2	1	2	1	19 (30%)
Age-group 30–35	8	2	1	2	1	14 (22%)
Age-group 36–40	7	4	3	0	3	17 (26%)
The inmates' marital status						
Married inmates prior to offending	21	3	2	1	3	30 (47%)
Unmarried inmates	17	6	5	4	2	34 (53%)
The inmates' offending pattern						
Recidivist inmates (repeaters)	17	4	3	4	2	30 (47%)
Non-recidivist inmates	21	5	4	1	3	34 (53%)
The parents' marital status						
Inmates with married parents	20	4	5	4	4	36 (56%)
Inmates with non-married parents	18	5	2	1	1	28 (44%)
The inmates' education						
Inmates with primary education	10	1	4	0	0	15 (23%)
Inmates with secondary education	28	8	3	5	5	49 (77%)
The inmates' employment status						
Employed before incarceration	37	6	6	4	5	58 (91%)
Unemployed inmates	1	3	1	1	0	6 (9%)
The inmates' nationality						
Brunei citizens	33	8	6	4	5	56 (88%)
Permanent residents	5	1	1	1	0	8 (12%)
District at time of imprisonment						
Brunei-Muara	27	6	7	2	2	44 (69%)
Tutong	6	2	0	0	2	10 (16%)
Kuala Belait	4	1	0	3	1	9 (14%)
Temburong	1	0	0	0	0	1 (1%)

[a] Stealing related (coded 1), e.g., theft, burgulary, defrauding

[b] Drug related (coded 2), e.g., growing drug plants, abusing drugs, trafficking drugs

[c] Sex related (coded 3), e.g., rape, incest, adultery, prostitution/female trafficking

[d] Violence related (coded 4), e.g., aggression, fighting, injuring, arson/fire setting

[e] Deception related (coded 5), e.g., conning, forgery, corruption, scamming/sparming, gambling

sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism) as well as three global indices (Global Severity Index, Positive Symptom Distress Index, and Positive Symptom Total). Each item is rated on a five-point Likert-type scale of distress (0 =

"not at all" to 4 = "extremely"). The SCL-90-R is a measure of current, point-in-time, psychological symptom status. The reference time set is "the past 7 days including today." The questionnaire can be administered once or can be used repeatedly to document formal outcomes, response trends, or pre-post therapeutic evaluations. We translated and administered the SCL-90-R in the same way we did with the demographic questionnaire and the PCL-R and for similar reasons. The Kappa inter-coder agreement reliability coefficient for the translated SCL-90-R scale that was used in data collection was 0.764. The descriptive statistics and reliability values for the SCL-90-R subscales are also presented in Table 2 together with those for the PCL-R. Evidence in this table indicates that the entire SC-90-R battery was reliable for use with participants in our study.

Validity of the Rating Scales

In addition to being reliable, both quantitative inventories (PCL-R and SCL-90-R) employed in the present study were also valid and suitable for use in our Brunei study. As shown in Table 2, the items in each subscale had a high average corrected item-to-scale correlation (an indication of the extent to which they were homogeneous or unidimensional and measured the same construct). Psychometric theory holds that an item is suitable if it correlates positively and highly with adjusted or non-spurious total scores of which it does not form a part (see Rust and Golombok 1989). To be supportive of internal consistency and construct validity, mean item-to-scale correlations should be above the minimum accepted level of 0.300 (Shrigley 1983; Gable 1986; Gogolin and Swartz 1992). All the subscales in Table 2 met this rigorous criterion. Furthermore, the interscale correlations presented in Table 3 indicate the degree of either convergence (concurrent) validity or discriminant (divergent) validity. The correlations in Table 3 demonstrate that several pairs of subscales from the two instruments had either adequate convergence or discriminant validity. Specifically, high positive correlations ($r \geq 0.70$) in this table (both significant and non-significant) suggested that the two subscales concerned were valid as measures of a similar construct and provided evidence for convergent/concurrent validity of the subscales. Conversely, any two paired subscales with a low positive, zero, or negative correlation ($r \leq 0.69$) which was either significant or

Table 2 PCL-R and SCL-90-R subscale descriptive statistics and reliability ($N = 64$)

Subscale	Items	Mean	SEM	Median	SD	ACISr	Alpha
PCL-R subscales							
Interpersonal	4	6.703	0.324	7.000	2.592	0.644	0.800
Affective	4	6.437	0.294	6.000	2.356	0.572	0.728
Lifestyle	7	10.625	0.422	10.000	3.382	0.602	0.742
Antisocial	5	7.843	0.312	8.000	2.502	0.526	0.643
SCL-90-R subscales							
Somatization	12	0.281	0.869	6.000	6.956	0.725	0.844
Obsessive–compulsive	10	12.906	1.006	12.000	8.048	0.613	0.829
Interpersonal sensitivity	9	9.421	0.845	8.000	6.767	0.502	0.774
Depression	13	15.920	1.197	14.000	9.652	0.672	0.840
Anxiety	10	9.015	0.900	8.000	7.201	0.610	0.795
Hostility	6	3.281	0.429	2.000	3.438	0.378	0.638
Phobic anxiety	7	5.671	1.018	3.000	8.151	0.535	0.779
Paranoid ideation	6	5.343	0.535	4.000	4.284	0.499	0.728
Psychoticism	10	8.333	0.802	6.000	6.468	0.461	0.723

ACISr average corrected item-to-scale correlation

non-significant implied that the subscales concerned were valid as measures of different constructs (evidence for discriminant/divergent validity of the subscales). The criterion value we chose was $r = 0.70$ which when squared (r^2) gives a coefficient of determination of approximately 50% (minimum acceptable common variance explained by the two variables). The higher the coefficient of determination, the more valid and suitable the two paired subscales were as measures of either identical or different constructs. For three main reasons, we did not perform any factor analyses on the PCL-R and SCL-90-R to determine their construct validity. First, the current study was not largely a validation of these instruments. Second, factor analytic information would have lengthened the paper to beyond acceptable limits and it was beyond the scope and objectives of the current study. Third, some previous studies that used the PCL-R (e.g., Edens et al. 2015; Norris 2011) and the SCL-90-R (e.g., Nojomi and Gharayee 2007; Merport and Recklitis 2012) did not also re-factor analyze these scales.

Data Analysis

The categorical data from the demographic interview schedule were analyzed quantitatively using frequencies and percentages. The categories were used as grouping variables when computing inferential statistics described in the following sections. However, the data from the two psychometric inventories (PCL-R and SCL-90-R) were first scored according to instructions in the technical manual for each instrument. Then, the data were analyzed quantitatively using descriptive statistics (frequencies, percentages, mean, and standard deviation) and inferential statistics (Pearson correlations, hierarchical multiple regression analysis, multiple logistic regression analysis, and hierarchical binary logistic regression analysis). To determine the importance of our findings, we used two-tailed tests of statistical significance at both $p = .05$ and $p = .01$ levels and tests of statistical power such as effect sizes (F change statistics with the hierarchical multiple regression analysis, R squares for all regression analyses, and model fit indices for binary and multinomial logistic regression analyses). All the statistical analyses were performed on SPSS version 22.

Procedures

The present study was funded by the Government of Brunei Darussalam through the University of Brunei Darussalam (UBD), a state tertiary institution fully financed by the government. Written permission and approval to conduct the study were obtained from the University of Brunei Darussalam Ethics Committee and the Prison Department Ethics Committee. Both ethical committees granted ethical clearance for the study on behalf of the Government of Brunei Darussalam. In addition, ethical conditions and rights (e.g., anonymity, confidentiality, privacy, voluntary participation, protection from harm, and informed consent) for participating in the study were first explained verbally in Bahasa Melayu language to individual research participants. After this, verbal informed consent was secured from each research participant at the time of collecting data (inmates were not allowed to have a pencil and paper to write). Only the inmates who voluntarily agreed to participate in the study were recruited. Coercion and deception were not used when recruiting the participants. As explained previously under the "Instruments" section, all the study's research tools (demographic, PCL-R and SCL-90-R) were translated to and administered in Malay to reduce or eliminate linguistic and cultural biases. To boost the study's ecological validity, data collection occurred in a prison setting and trained prison officials collected the data on behalf of the researchers.

Table 3 PCL-R and SCL-90-R intersubscale correlations as evidence of convergence and discriminant validity ($N = 64$)

Scales	1	2	3	4	5	6	7	8	9	10	11	12
1. Interpersonal	1											
2. Affective	0.450**	1										
3. Lifestyle	0.560**	0.509**	1									
4. Antisocial	0.467**	0.381**	0.556**	1								
5. Somatization	0.087	0.165	0.038	−0.014	1							
6. Obsessive–compulsive	0.199	0.291*	0.241	0.097	0.645**	1						
7. Interpersonal sensitivity	0.102	0.281*	0.350**	0.041	0.475**	0.732**	1					
8. Depression	0.177	0.247*	0.177	0.066	0.647**	0.812**	0.728**	1				
9. Anxiety	0.146	0.238	0.243	0.023	0.706**	0.790**	0.721**	0.847**	1			
10. Hostility	0.188	0.439**	0.230	0.271*	0.616**	0.624**	0.478**	0.566**	0.575**	1		
11. Phobic anxiety	−0.038	0.165	0.263*	−0.086	0.299*	0.425**	0.688**	0.390**	0.394**	0.104	1	
12. Paranoid ideation	0.078	0.199	0.114	0.067	0.718**	0.756**	0.672**	0.736**	0.777**	0.703**	0.296*	1
13. Psychoticism	0.095	0.161	0.148	0.139	0.576**	0.718**	0.500**	0.639**	0.659**	0.605**	0.182	0.761**

*$p < .05$ (two-tailed); **$p < .01$ (two-tailed)

Results

The major findings of the present study solely based on the sample are presented by tables and per objectives of the investigation. Most of the findings in these tables are not compared to previous trends due to lack of similar past research and data based on the same variables as investigated in the current study.

Types of Crime Committed by the Participants

The participants' demographic information by type of crime committed is presented in Table 1. According to this table, the majority of crimes committed by the participants were stealing-related (59%) followed by drug-related (14%) and sex-related (11%) offenses. Males were not only overrepresented in the sample but also predominant on every type of crime. The prime ages (or age-groups) for offending were 24–29 (30%) and 36–40 (26%). Overall, unmarried inmates (53%) both slightly outnumbered their married counterparts (47%) and were also dominant on drug, sex, and violence offenses. Non-recidivist inmates accounted for most of the crimes (53%) and were the majority on four of the five major offenses (stealing, drugs, sex, and deception) presented in Table 1. We obtained two surprising results that were contrary to our expectations. First, the sample had more inmates with married parents (56%) who were most prevalent on four of the five reported broad crimes compared to offenders whose parents were not married (single, divorced, or widowed). In Brunei, like elsewhere in most other countries, criminals are generally thought to be people from non-intact families. This finding (which needs to be probed by future research) suggested that the type of family was less important compared to parenting skills when raising law-abiding children. For example, developmental psychologists point out that coercive home environments were breeding grounds for aggression and delinquency (see Shaffer 2002). Second, our sample had more participants in high numbers across all the five types of crime who were employed prior to incarceration (91%) compared to peers who were unemployed before imprisonment. In Brunei, criminality associated with stealing is often attributed to unemployment and our finding directly contradicts this notion. The largest crime committed by the participants was stealing. In their responses to data collection interview probes, most inmates convicted of stealing cited the need to support the family and lack of money due to having a low and poorly paid job as the causal factors. The majority of the participants (88%) were full Brunei citizens and resided mostly in Brunei-Muara district (69%), the metropolitan area with the highest concentration of the population.

Relationship between Psychopathic Personality and Mental Health in a Brunei Sample

During our search for relevant literature to be included in the current study, we did not come across a Brunei study that compared psychopathy with mental health and we thought we could contribute to narrowing this knowledge gap. Based on data from our Brunei sample of inmates, the relationship between psychopathic personality (measured by PCL-R subscales) and mental health (assessed by SCL-90-R subscales) is presented by correlations in Table 3 which also provides information about the convergence and discriminant validity of the subscales concerned. The interpersonal subscale of the PCL-R was not significantly related to any subscale of the SCL-90-R in the Brunei context. However, the affective subscale of PCL-R was

significantly related to four subscales of SCL-90-R, namely obsessive–compulsive (r(64) = 0.291, $p < .05$), interpersonal sensitivity (r(64) = 0.281, $p < .05$), depression (r(64) = 0.247, $p < .05$), and hostility (r(64) = 0.439, $p < .01$). Lifestyle (PCL-R) was associated with two SCL-90-R subscales: interpersonal sensitivity (r(64) = 0.350, $p < .01$) and phobic anxiety (r(64) = 0.263, $p < .05$). Antisociality (PCL-R) correlated with hostility measured by SCL-90-R (r(64) = 0.271, $p < .05$). We discuss these links or connections in the following sections.

Relationship between Demographic Variables, Psychopathic Personality, and Mental Health Disorders with Criminality

Due to floating point overflow problems caused by entry of too many variables in a regression model, we could not jointly determine the relationship between the demographic variables (biodata), psychopathy (PCL-R subscales), and mental health (SCL-90-R subscales) with criminality (type of offenses committed), in a single hierarchical multiple regression analysis with backward elimination. To address this technical problem, we fitted three separate models between each of the three independent variables (biodata, psychopathy, and mental health) versus a common dependent variable (type of offenses committed).

Relationship between Demographic Variables and Criminality (Types of Crime Committed)

To explore, identify and select demographic variables that contributed to criminal behavior in the Brunei sample, we employed the hierarchical multiple regression analysis with backward elimination. In step 1 (also known as model 1), all the biodata independent variables (IVs) were entered and regressed on the dependent variable or DV (criminality/type of offenses committed). SPSS (version 22) iteratively processed the data in a series of four steps. The first required information from this analysis concerning the change statistics is presented in Table 4. For purposes of data reduction and space conservation, only the first and last models are shown in this table. All the four models were statistically significant as indicated by the F values for model 1 and model 4 in Table 4, suggesting that the demographic variables (as a group) were relevant in analyzing the sample's criminality. The IVs in model 1 and model 4 shared approximately 76 and 75% variance, respectively, with the DV.

Table 5 shows the specific contribution of each categorical IV to criminal behavior. Step 1 (first model) was overfitted, contained both the needed and the unwanted IVs, and less efficient. The unnecessary IVs had higher standard errors. In the subsequent models, SPSS

Table 4 Change statistics for the hierarchical multiple regression analysis of demographic variables on types of crime ($N = 64$)

Model[a]	F (df)	R	R^2	Adjust R^2	SEest	Change statistics				
						ΔR	ΔF	$df1$	$df2$	Sig. ΔF
1	20.493*** (7, 46)	0.870	0.757	0.720	1.30775	0.757	20.493	7	46	0.000***
4	37.608*** (4, 49)	0.869	0.754	0.734	1.27461	-0.001	0.178	1	48	0.675

***p < .001 (two-tailed)

[a] Both the first and last models were significant and accounted for more than 75% of the variance

Table 5 Hierarchical multiple regression analysis with backward elimination showing relationship between sociodemographic variables and types of crime committed ($N = 64$)

Model/variables	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% CI for B	
	B	SEest	Beta			Lower	Upper
Step 1							
Gender	1.236	0.548	0.566	2.256	0.029*	0.133	2.339
The inmates' age at the time of data collection (in age-groups)	0.259	0.161	0.288	1.610	0.114	−0.065	0.582
The inmates' educational level	0.221	0.387	0.164	0.569	0.572	−0.559	1.001
The inmates' employment status at the time of incarceration	-0.327	0.573	−0.150	−0.570	0.571	−1.481	0.827
The inmates' marital status at the time of imprisonment	0.607	0.352	0.399	1.724	0.092***	−0.102	1.315
Marital status of the inmates' parents prior to imprisonment	−0.665	0.361	−0.418	−1.844	0.072***	−1.390	0.061
Recidivism status of inmates at the time of data collection	0.115	0.399	0.034	0.289	0.774	−0.687	0.917
Step 4							
Gender	1.239	0.460	0.568	2.692	0.010**	0.314	2.164
The inmates' age at the time of data collection (in age-groups)	0.267	0.145	0.298	1.840	0.072***	−0.025	0.558
The inmates' marital status at the time of imprisonment	0.602	0.294	0.396	2.050	0.043*	0.012	1.193
Marital status of the inmates' parents prior to imprisonment	−0.610	0.315	−0.383	−1.935	0.054*	−1.243	0.023

*$p < .05$ (two-tailed); **$p < .01$ (two-tailed); ***$p < .10$ (two-tailed; neared significance at 0.05 level)

hierarchically removed the irrelevant terms stepwise. Step 4 (last model) was underspecified but contained only the best four and statistically significant predictors of criminality in our Brunei sample of convicts that had lower standard errors. The suitable IVs were gender, the inmates' age at the time of data collection (in age-groups), the inmates' marital status at the time of imprisonment, and marital status of the inmates' parents prior to imprisonment. One of the two genders (male or female) was likely to offend ($B = 1.239$, $p < .01$). With regard to the inmates' marital status (coded as 1 if married, 2 otherwise), one of these two categories was likely to committee crimes ($B = 0.602$, $p < .05$). Concerning the parents of inmates, either the inmates with married parents (coded 1) or those with unmarried parents (coded 2) were less likely to offend ($B = -0.610$, $p < .05$). Evidence also indicated that inmates in one or more of the four age-groups were prone to offending ($B = 0.267$, $p < .10$). However, these are broad findings. Because both the IVs and the DV were categorical variables, it was difficult from Table 5 to know the exact relationship between each specific category of an IV versus each specific category of the DV. These problems are addressed in the analyses that follow and whose results are presented in Tables 6, 7, and 8.

Relationship between Psychopathic Personality and Criminality (Types of Crime Committed)

Unlike the demographic variables used in the current study, the PCL-R was already a well established, widely researched, and globally used measure of psychopathy. Its suitability for use with inmates in Brunei is demonstrated by the quality indices embedded in Tables 2 and

Table 6 Multiple logistic regression analysis showing relationship between psychopathic personality and types of crime committed ($N = 64$)

Variables	B^a	SEest	Wald X^2	*df*	Sig.	OR	95% CI for OR	
							Lower	Upper
Stealing-related offenses								
Interpersonal (high scorers, coded 1)	−0.627	0.285	4.842	1	0.028*	0.534	0.306	0.934
Affective (high scorers, coded 1)	1.088	0.490	4.928	1	0.026*	2.968	1.136	7.755
Lifestyle (high scorers, coded 1)	−0.156	0.227	0.472	1	0.492	0.856	0.548	1.335
Antisocial (high scorers, coded 1)	0.223	0.289	0.597	1	0.440	1.250	0.710	2.202
Drug-related offenses								
Interpersonal (high scorers, coded 1)	−0.645	0.316	4.165	1	0.041*	0.525	0.282	0.975
Affective (high scorers, coded 1)	1.140	0.515	4.897	1	0.027*	3.126	1.139	8.577
Lifestyle (high scorers, coded 1)	−0.426	0.268	2.524	1	0.112	0.653	0.386	1.105
Antisocial (high scorers, coded 1)	0.367	0.318	1.329	1	0.249	1.443	0.774	2.691
Sex-related offenses								
Interpersonal (high scorers, coded 1)	−0.693	0.360	3.707	1	0.054*	0.500	0.247	1.013
Affective (high scorers, coded 1)	0.666	0.537	1.537	1	0.215	1.947	0.679	5.579
Lifestyle (high scorers, coded 1)	0.024	0.266	0.008	1	0.927	1.025	0.608	1.725
Antisocial (high scorers, coded 1)	0.140	0.349	0.162	1	0.687	1.151	0.581	2.280
Violence-related offenses								
Interpersonal (high scorers, coded 1)	−0.721	0.357	4.069	1	0.044*	0.486	0.241	0.980
Affective (high scorers, coded 1)	1.097	0.527	4.331	1	0.037*	2.997	1.066	8.424
Lifestyle (high scorers, coded 1)	0.020	0.280	0.005	1	0.943	1.020	0.589	1.765
Antisocial (high scorers, coded 1)	−0.203	0.394	0.265	1	0.606	0.816	0.377	1.766

Reference/comparison group = deception-related offenses

*$p < .05$ (two-tailed)

[a] Model R squares: 0.627 (Cox and Snell), 0.654 (Nagelkerke); 0.307 (McFadden). Model fit: X^2 ($df = 16$) = 62.191, $p = .000$ (final likelihood ratio test); X^2 (df = 224) = 217.885, $p = .603$ (Pearson goodness of fit)

3 of the present study. Prior to determining the relationship between psychopathy and criminality, we dichotomized at the median (see Table 2) the total scores on each PCL-R subscale to derive two categories (high scorers above the median coded 1 and low scorers below the median coded 2), to make the results easier to interpret. In this way, both our IVs (psychopathy total subscale scores with two categories) and the DV (criminality/type of crime committed with five categories) were categorical. We then performed a multiple logistic regression analysis using the fifth or last criminal category (deception-related offenses as the reference/comparison group). The obtained results are reported in Table 6. The model was effective as it accounted for about 63–65% of the common variance between the IVs and DV as shown by the R^2 values at the bottom of Table 6. In addition, the model was also suitable as indicated by the fit indices presented at the end of Table 6. We observed that the interpersonal and affective variables had respectively negative and positive trends/patterns of effect or influence on the four types of offenses presented in Table 6 (stealing, drugs, sex, and violence). Compared to the participants' performance on deception-related offenses, high scorers on the interpersonal subscale, inmates who related and interacted well with other people, were less likely to committee stealing-related offenses ($B = −0.627$, $p < .05$; OR = 0.534, 95% CI = 0.306–0.934). However, the high scorers on the affective subscale, those with poor affect or who lacked compassion, empathy, and remorse, were 2.9 times more likely to engage in stealing-related offending ($B = 1.088$, $p < .05$; OR = 2.968, 95% CI = 1.136–7.755). High scorers on the antisocial subscale

Table 7 Multinomial logistic regression analysis showing relationship between mental health disorders and types of crime committed ($N = 64$)

Variables	*B*	SEest	Wald X^2	*df*	Sig.	OR	95% CI for OR	
							Lower	Upper
Stealing-related offenses								
Somatization (high scorers, coded 1)	−0.131	0.110	1.430	1	0.232	0.877	0.707	1.088
Obsessive–compulsive (high scorers, coded 1)	−0.148	0.148	1.000	1	0.317	0.862	0.644	1.153
Interpersonal sensitivity (high scorers, coded 1)	0.010	0.183	0.003	1	0.958	1.010	0.706	1.445
Depression (high scorers, coded 1)	0.228	0.120	3.648	1	0.051*	1.256	0.994	1.588
Anxiety (high scorers, coded 1)	−0.166	0.166	1.003	1	0.317	0.847	0.612	1.172
Hostility (high scorers, coded 1)	−0.097	0.263	0.136	1	0.712	0.908	0.542	1.519
Phobic anxiety (high scorers, coded 1)	−0.044	0.095	0.213	1	0.644	0.957	0.794	1.154
Paranoid ideation (high scorers, coded 1)	0.036	0.255	0.020	1	0.887	1.037	0.629	1.709
Psychoticism (high scorers, coded 1)	0.426	0.254	2.801	1	0.074**	1.531	0.930	2.521
Drug-related offenses								
Somatization (high scorers, coded 1)	−0.185	0.138	1.799	1	0.180	0.831	0.634	1.089
Obsessive–compulsive (high scorers, coded 1)	−0.085	0.166	0.261	1	0.609	0.919	0.663	1.272
Interpersonal sensitivity (high scorers, coded 1)	−0.220	0.220	0.996	1	0.318	0.803	0.521	1.236
Depression (high scorers, coded 1)	0.162	0.144	1.257	1	0.262	1.176	0.886	1.560
Anxiety (high scorers, coded 1)	−0.033	0.200	0.027	1	0.871	0.968	0.654	1.432
Hostility (high scorers, coded 1)	0.237	0.292	0.657	1	0.418	1.267	0.715	2.246
Phobic anxiety (high scorers, coded 1)	0.024	0.151	0.026	1	0.872	1.025	0.762	1.379
Paranoid ideation (high scorers, coded 1)	−0.207	0.327	0.398	1	0.528	0.813	0.428	1.545
Psychoticism (high scorers, coded 1)	0.418	0.263	2.519	1	0.113	1.519	0.906	2.545
Sex-related offenses								
Somatization (high scorers, coded 1)	−0.184	0.148	1.539	1	0.215	0.832	0.622	1.113
Obsessive–compulsive (high scorers, coded 1)	−0.351	0.202	3.027	1	0.082**	0.704	0.474	1.045
Interpersonal sensitivity (high scorers, coded 1)	−0.002	0.243	0.000	1	0.995	0.998	0.620	1.608
Depression (high scorers, coded 1)	0.060	0.147	0.165	1	0.685	1.061	0.796	1.415
Anxiety (high scorers, coded 1)	0.167	0.212	0.623	1	0.430	1.182	0.780	1.791
Hostility (high scorers, coded 1)	0.131	0.305	0.184	1	0.668	1.140	0.627	2.071
Phobic anxiety (high scorers, coded 1)	0.106	0.119	0.787	1	0.375	1.111	0.880	1.403
Paranoid ideation (high scorers, coded 1)	−0.164	0.322	0.258	1	0.612	0.849	0.452	1.596
Psychoticism (high scorers, coded 1)	0.484	0.267	3.300	1	0.069**	1.623	0.963	2.738
Violence-related offenses								
Somatization (high scorers, coded 1)	−0.698	0.395	3.125	1	0.077**	0.497	0.229	1.079
Obsessive–compulsive (high scorers, coded 1)	0.011	0.284	0.002	1	0.968	1.011	0.580	1.763
Interpersonal sensitivity (high scorers, coded 1)	−0.314	0.490	0.411	1	0.521	0.730	0.279	1.909
Depression (high scorers, coded 1)	0.154	0.209	0.541	1	0.462	1.166	0.774	1.756
Anxiety (high scorers, coded 1)	0.199	0.326	0.372	1	0.542	1.220	0.644	2.314
Hostility (high scorers, coded 1)	−3.577	2.519	2.017	1	0.156	0.028	0.000	3.896
Phobic anxiety (high scorers, coded 1)	0.199	0.290	0.470	1	0.493	1.220	0.691	2.156
Paranoid ideation (high scorers, coded 1)	0.221	0.482	0.210	1	0.646	1.248	0.485	3.211
Psychoticism (high scorers, coded 1)	0.533	0.333	2.554	1	0.110	1.703	0.886	3.274

Reference/comparison group = deception-related offenses. Model *R* squares: 0.709 (Cox and Snell), 0.739 (Nagelkerke); 0.384 (McFadden). Model fit: X^2 ($df = 36$) = 77.777, $p = .000$ (final likelihood ratio test); X^2 (df = 216) = 162.572, $p = .997$ (Pearson goodness of fit)

*$p < .05$ (two-tailed); **$p < .10$ (two-tailed; neared significance at 0.05 level)

Table 8 Binary logistic regression analysis showing the relationship between sociodemographics, criminality, psychopathy, and mental health with recidivism ($N = 64$)

Model[b]/variables	B[a]	SEest	Wald X^2	df	Sig.	OR	95% CI for OR	
							Lower	Upper
Step 1								
Males (coded 1)	7.315	3.379	4.686	1	0.030*	1502.549	1.997	1,130,523.835
Age-groups			2.373	3	0.499			
Age-group 18–23 (coded 1)	−1.288	1.487	0.750	1	0.386	0.276	0.015	5.084
Age-group 24–29 (coded 2)	−0.153	1.547	0.010	1	0.921	0.858	0.041	17.802
Age-group 30–35 (coded 3)	1.761	1.733	1.033	1	0.309	5.821	0.195	173.803
Inmates with primary education (coded1)	2.229	2.007	1.234	1	0.267	9.295	0.182	474.668
Employed inmate (coded 1)	−3.800	2.755	1.902	1	0.168	0.022	0.000	4.953
Married prisoner (coded 1)	−1.357	1.607	0.713	1	0.399	0.257	0.011	6.008
Inmates with married parents (coded 1)	−1.927	1.185	2.646	1	0.104	0.146	0.014	1.484
Types of crimes committed			3.550	4	0.470			
Stealing-related offenses (coded 1)	−2.168	1.682	1.661	1	0.197	0.114	0.004	3.093
Drug-related offenses (coded 2)	−3.369	1.865	3.264	1	0.071***	0.034	0.001	1.331
Sex-related offenses (coded 3)	−0.349	2.610	0.018	1	0.893	0.705	0.004	117.432
Violence/aggression-related offenses (coded 4)	−2.770	2.900	0.912	1	0.339	0.063	0.000	18.436
Interpersonal (high scorers, coded 1)	−1.866	1.264	2.179	1	0.140	0.155	0.013	1.843
Affective (high scorers, coded 1)	0.621	1.907	0.106	1	0.745	1.861	0.044	78.130
Lifestyle (high scorers, coded 1)	0.402	1.517	0.070	1	0.791	1.494	0.076	29.198
Antisocial (high scorers, coded 1)	0.729	1.013	0.518	1	0.472	2.074	0.285	15.112
Somatization (high scorers, coded 1)	−1.808	1.305	1.919	1	0.166	0.164	0.013	2.116
Obsessive–compulsive (high scorers, coded 1)	−2.274	2.113	1.157	1	0.282	0.103	0.002	6.479
Interpersonal sensitivity (high scorers, coded 1)	0.794	1.953	0.165	1	0.685	2.211	0.048	101.649
Depression (high scorers, coded 1)	4.777	2.649	3.252	1	0.071***	118.790	0.660	21,365.609
Anxiety (high scorers, coded 1)	−3.725	2.485	2.247	1	0.134	0.024	0.000	3.144
Hostility (high scorers, coded 1)	−0.029	1.584	0.000	1	0.985	0.972	0.044	21.667
Phobic anxiety (high scorers, coded 1)	−2.560	2.378	1.159	1	0.282	0.077	0.001	8.170
Paranoid ideation (high scorers, coded 1)	2.673	1.636	2.669	1	0.102	14.476	0.586	357.440
Psychoticism (high scorers, coded 1)	1.626	1.779	0.835	1	0.361	5.082	0.156	165.972
Step 19								
Males (coded 1)	1.184	0.467	6.420	1	0.011**	3.268	1.308	8.169
Inmates with married parents (coded 1)	−1.363	0.581	5.504	1	0.019*	0.256	0.082	0.799

*$p < .05$ (two-tailed); **$p < .01$ (two-tailed); ***$p < .10$ (two-tailed; neared significance at 0.05 level))

[a] The B and other coefficients in this table refer either to the first group or high scorers on all the scaled variables (coded 1) who were compared either to the second group or low scorers (reference group coded 2) or contrasted with the last group of a multicategorical variable

[b] Step 1: R squares = 0.435 (Cox and Snell), 0.580 (Nagelkerke); Hosmer and Lemeshow X^2 ($df = 8$) = 11.631, $p = .168$. Step 19: R squares = 0.143 (Cox and Snell), 0.190 (Nagelkerke); Hosmer and Lemeshow X^2 ($df = 2$) = 2.919, $p = .232$

indicated a criminal trend were nearly 1.3 times more likely to indulge in stealing-related offenses (B = 0.223, p > .05; OR = 1.250, 95% CI = 0.710–2.202). With regard to drug-related offending, high scorers on the interpersonal variable were less likely to be involved in drug crimes (B = −0.645, p < .05; OR = 0.525, 95% CI = 0.282–0.975). However, high scorers on the affective domain had high likelihood to be drug criminals (B = 1.140, p < .05; OR = 3.126, 95% CI = 1.139–8.577). Similarly, high scorers on the antisocial subscale also had a high probability of committing drug offenses (B = 0.367, p > .05; OR = 1.443, 95% CI = 0.774–2.691). High scorers on the interpersonal subscale had lower likelihood of perpetrating sex-related offenses (B = −0.693, p < .05; OR = 0.500, 95% CI = 0.247–1.013). On the other hand, high scorers on the affective subscale were more likely to have high propensity for committing sex offenses (B = 0.666, p > .05; OR = 1.947, 95% CI = 0.679–5.579). Both lifestyle (OR = 1.025) and antisociality (OR = 1.151) had some potential to influence sex offending. The affective variable was the best predictor of violent-related offenses which high scorers were almost three times more likely to pursue (B = 1.097, p < .05; OR = 2.997, 95% CI = 1.066–8.424). The high scorers on the interpersonal subscale were less likely to be associated with violent crimes (B = −0.721, p < .05; OR = 0.486, 95% CI = 0.241–0.980).

Relationship between Mental Health Disorders and Criminality (Types of Crime Committed)

After dichotomizing the SCL-90-R subscale total scores the same way we did to the PCL-R variables, we run a multinomial logistic regression analysis model using the SCL-90-R subscales as IVs, types of crime committed as the DV, and deception-related offenders as the reference or comparison group. The outcomes from this analysis are presented in Table 7. This model too was effective as it accounted for about 71–74% of the common variance between the IVs and DV as shown by the R^2 values at the bottom of Table 7. Furthermore, the model was also suitable as demonstrated by the fit indices presented at the end of Table 7. Depression had a significant relationship with stealing-related offending and high scorers on this variable were about 1.3 times more likely to follow a stealing path of life (B = 0.228, p < .05; OR = 1.256, 95% CI = 0.994–1.588). The second variable that was most related to stealing and which almost approached significance at p = .05 level was psychoticism. High scorers on psychoticism were 1.5 times more likely to adopt stealing for a living (B = 0.426, p < .10; OR = 1.531, 95% CI = 0.930–2.521). Two variables (hostility and psychoticism) had potential to influence drug-related offending. High scorers on hostility were 1.3 times more likely to deal in drug crimes (B = 0.237, p > .05; OR = 1.267, 95% CI = 0.715–2.246) while high scorers on psychoticism were 1.5 times more likely to be connected with drug offenses (B = 0.418, p > .05; OR = 1.519, 95% CI = 0.906–2.545). Of all the nine SCL-90-R variables listed in Table 7, psychoticism was the most linked to sex offending and nearly reached the significance level at p = .05. High scorers on psychoticism were 1.6 times more likely to be involved in sex offending (B = 0.484, p < .10; OR = 1.623, 95% CI = 0.963–2.738). Only the high scorers on psychoticism had the highest odds and likelihood of committing violent/aggressive crimes (B = 0.533, p > .05; OR = 1.703, 95% CI = 0.886–3.274). Several mental health disorders listed in Table 7 have negative B regression coefficients suggesting that they had less influence or effect on the type(s) of crime concerned.

Relationship between Demographic Variables, Psychopathic Personality, Mental Health Disorders, and Types of Crime Committed with Criminal Recidivism (Repeat Offending)

For purposes of investigating the participants' probability of re-offending after release, we used the binary logistic regression analysis with backward elimination to explore, identify, and select predictor variables that were most relevant. This type of regression analysis required a dichotomous DV while the IVs could be continuous, dichotomous, multicategorical, or a combination of these. In the present study, our DV was the inmate's admission rate (or recidivism) into prison which was coded as one (1), if it was the second, third, and other multiple subsequent times, and zero (0) if this was the first time to be incarcerated. An item to collect this information was placed in the demographic questionnaire. The IVs included the demographic variables, psychopathic personality subscales (PCL-R), mental health disorders subscales (SCL-90-R), and criminality (types of crime committed) already described previously in "Relationship Between Demographic Variables, Psychopathic Personality, and Mental Health Disorders with Criminality" to "Relationship Between Mental Health Disorders and Criminality (Types of Crime Committed)" and presented in Tables 4, 5, 6, and 7. SPSS (version 22) iteratively processed and analyzed the data in 19 steps to provide the results presented in Table 8 (only first and last steps shown for brevity). Like our other regression analyses in the current study, this binary logistic model was satisfactory, since it accounted for 44–58% of the variance in the first step and 14–19% in the last step. The model was also acceptable as illustrated by the fit indices at the bottom of Table 8. Male gender and inmates with married parents were the two variables most significantly related to recidivism but in the opposite direction (see Table 8, step 19). Compared to female counterparts, male inmates were 3.3 times more likely to re-offend ($B = 1.184$, $p < .001$; OR = 3.268, 95% CI = 1.308–8.169). On the other hand, inmates with married parents were less likely to repeat the offense compared to those whose parents were either divorced, single, or widowed ($B = -1.363$, $p < .05$; OR = 0.256, 95% CI = 0.082–0.799). Though related positively but not significantly to recidivism, several variables in Table 8 had high odds ratios (OR values) and showed a trend for influencing re-offending in high scorers. These include age-group 30–35 (OR = 5.821), inmates with primary education (9.295), affective (1.861), lifestyle (1.494), antisocial (2.074), interpersonal sensitivity (2.211), depression (118.790), paranoid ideation (14.476), and psychoticism (5.082). One of our main findings on re-offending was that all the four major types of crime listed in Table 8 correlated negatively with recidivism, suggesting that perpetrators were less likely to repeat these crimes after release compared to convicted felons who committed the deception-related offenses (reference category). The most least likely to be repeated were drug-related offenses ($B = -3.369$, $p < .10$) followed by violence-related offenses ($B = -2.770$, $p > .05$), stealing-related offenses ($B = -2.168$, $p > .05$), and sex-related offenses ($B = -0.349$, $p > .05$). Implications related to these findings are discussed in the following section.

Discussion and Recommendations

We obtained a number of findings some of which require further interpretation and clarification here. They are briefly discussed in the following sections under separate subheadings according to the objectives of the study.

Types of Crimes Committed by the Participants

As indicated in Table 1, stealing-related offending was unsurprisingly the biggest of the five major crimes committed by participants in our study sample. Our findings on stealing and drug offending were consistent with the Department of Economic Planning and Development's (2015) and Bandial's (2015) reports that also cited stealing as the largest offense in Brunei followed by drug crimes. However, the Prison Department's (2012) report ranked road traffic offenses as the biggest crime and this was followed by theft and drug crimes. Based on our findings, more attention and efforts should be directed at containing stealing-related offenses which accounted for about 60% (two thirds) of all the crimes in this sample. The second priority in intervention should be accorded to drug and sex offenses. Drug trafficking is a serious offense in Brunei punishable by death under the Misuse of Drugs Act (MDA) law. Similarly, sex offenses are equally serious crimes severely punished under the newly introduced Syariah Penal Code in Brunei.

Relationship between Psychopathic Personality and Mental Health

Both psychopathy (measured by the PCL-R scale) and mental health (assessed by the SCL-90-R scale) were implicated in criminal life in the present study as well as in previous research (see Loucks and Wuerscher 1984; Hare and McPherson 1984; Loucks and Zamble 1994 on psychopathy; and Laajasalo and Häkkänen 2004; Leue et al. 2004; Cohen and Galynker 2002; Dunsieth et al. 2004 on mental health). The relationship between these two constructs (psychopathy and mental health) is not very clear. For example, there are studies whose findings suggest that some psychopaths are not criminals and that APD might not be a component of psychopathy (Skeem and Cooke 2010). Furthermore, only about 30% of the people with APD may have psychopathic tendencies (Hart and Hare 1997; Dolan and Doyle (2007). On the contrary, researchers such as Hare and Neumann (2010) insist that antisociality was a part of psychopathy. In the present study, the affective subscale (PCL-R) was significantly related to four SCL-90-R subscales (obsessive–compulsive, interpersonal sensitivity, depression, and hostility). Lifestyle (PCL-R) was associated with interpersonal sensitivity and phobic anxiety (SCL-90-R). Antisociality (PCL-R) only correlated strongly with hostility (SCL-90-R). As indicated in Table 3, all these small but significant correlations ranged from 0.247 to 0.439 and accounted for only 6–19% of the common variance. Based on our findings in Brunei, we concur with Hare and Neumann (2010) that psychopathy was related to mental health because of the significant relationship between antisociality (PCL-R) and hostility (SCL-90-R) as well as the associations between impaired affect (PCL-R) and four SCL-90-R syndromes (obsessive–compulsive, interpersonal sensitivity, depression, and hostility).

Relationship between Demographic Variables and Criminality (Types of Crime Committed)

Based on findings from our Brunei sample of inmates, the best demographic predictors of criminal behavior were gender, the inmates' age at the time of data collection (in age-groups), the inmates' marital status at the time of imprisonment, and marital status of the inmates' parents prior to imprisonment. Several previous researchers have identified a wide range of demographic factors that were associated with criminality. Such variables include male gender

(Farrington et al. 2006), negative parenting (Shaffer 2002; Leschied et al. 2008), as well as peer group pressure and influence (Farrington and Ttofi 2011; Kosten et al. 2012). These findings need to be probed by future research in Brunei to gain more insights about family effects. For example, developmental psychologists point out that coercive home environments were breeding grounds for aggression and delinquency (see Shaffer 2002).

Relationship between Psychopathic Personality and Criminality (Types of Crime Committed)

In our study, inmates who had desirable interpersonal skills (high scorers on PCL-R interpersonal subscale) were less likely to committee stealing-related offenses. This concurs with Declercq et al. (2012) who found that the interpersonal subscale was related with predatory violence. Furthermore, Brunei convicts who scored high on the interpersonal subscale were also less likely to be associated with violent crimes, perpetrate sex-related offenses, and indulge in drug crimes. Qualitative research is recommended to gain additional information on these findings. Based on our findings, Brunei convicts with dysfunctional affects (e.g., lack of compassion and remorse) were more likely to steal. Psychopathic personality (tendency to have no remorse, no compassion, and no empathy) has been identified by previous research as a predictor of criminality (see Hare and Jutai 1983; Hare and McPherson 1984; Hare 1986; and Loucks and Zamble 1994). In addition, high scorers on the affective domain in our sample had high likelihood to be drug, violent, and sex offenders. Hare (as quoted in Legge et al. 2005) found that people with affective problems and psychopathic personality were overrepresented in prison populations of violent offenders. Like those with affect problems, Brunei inmates who scored high on the antisocial variable were also more likely to steal and be involved in drug offenses. However, some researchers have found out that not all antisocial persons are psychpatths and in turn not all people with psychpathic personality are criminals (Hart and Hare 1997; Dolan and Doyle 2007; Skeem and Cooke 2010). For reasons that are not clear in the absence of interviews with probes, lifestyle was found to have potential to influence sex offending in the present study. More research is needed to verify this finding.

Relationship between Mental Health Disorders and Criminality (Types of Crime Committed)

Previous research indicated that there was a relationship between mental health and psychopathy (Eysenck and Eysenck 1975; Eysenck 1977; Hathaway and McKinley 1989; Millon et al. 1997) and that people with antisocial personality disorder (APD) and psychopathy tended to be overrepresented among violent offenders (Rasmussen and Levander 1996; Fazel and Danesh 2002). Evidence from the present study showed that both psychopathic personality and mental health contributed to the criminal life of our Brunei prison participants. These were among the many major risk factors frequently reported in criminal behavior research reviewed previously (see Rasmussen and Levander 1996; Fazel and Danesh 2002; Hayes and O'Reilly 2013). One of the mental health disorders that was often implicated in criminal behavior was obsessive–compulsiveness (Laajasalo and Häkkänen 2004), but this was not found to be a main concern in our Brunei sample (see Table 7). From this same table, we noted that depression was significantly associated with stealing-related offending. The reasons for this were not clear as we did not employ interviews with probes to gain further information. Hostility was positively and significantly related with antisociality in our study. Brunei inmate high scorers on hostility

were found to be more likely to deal in drug crimes. However, previous research suggested that the main childhood and adolescent predictors of criminal behavior were aggression (Leschied et al. 2008) and interpersonal hostility (Walters 2005). In addition, Hare (as quoted in Legge et al. 2005) also found that people with psychopathic personality tended to be overrepresented in prison populations of violent offenders. Psychoticism was positively related to all the four major crimes presented in Table 7. Brunei convicts who scored high on the psychoticism variable were more likely to be involved in stealing, drug offenses, sex crimes, and violent/aggressive behavior or actions. Previous research evidence indicated that some mental health disorders (e.g., anxious–avoidant and obsessive–compulsive) were common among sexual offenders (Cohen and Galynker 2002; Leue et al. 2004; Dunsieth et al. 2004).

Relationship between Demographic Variables, Psychopathic Personality, Mental Health Disorders, and Types of Crime Committed with Criminal Recidivism (Repeat Offending).

One of our major findings on recidivism was that Brunei male inmates were the most likely to re-offend compared to their female counterparts. Because the majority of convicts in our Brunei sample were males, most of the recidivists were also likely to be males. The Prison Department's (2009, 2010, 2012) reports showed that there were 93, 96, and 86 recidivist offenders in Brunei prisons in 2009, 2010, and 2011, respectively. However, these reports did not state the gender composition of the repeat offenders. We also found out that inmates with married parents were less likely to repeat the offense. The reason for this difference could not be discerned from the quantitative data alone of the present study without interviewing with probes the convicts and their parents. Future research was needed to address this knowledge gap. Based on data from the current study sample, the following variables showed potential for influencing re-offending: age-group 30–35; inmates with primary education; and high scorers on the affective, lifestyle, antisocial, interpersonal sensitivity, depression, paranoid ideation, and psychoticism subscales. Previous research by Loucks and Wuerscher (1984) and Loucks and Zamble (1994) found that psychopathy, previous criminal convictions or recidivism, and substance abuse by the father were significant predictors of criminality. Surprisingly, all the four major types of crime we investigated (stealing, drugs, sex, violence/aggression, and deception) correlated negatively with recidivism as indicated in Table 8. The (first and last) most least likely to be repeated were drug-related offenses followed by violence, stealing, and sex offenses. In the absence of interviews with probes, it was not clear from the present study whether these findings were attributed to impacts of the MDA law and the newly introduced Syariah Penal Code both of which have stiff punishments for drug, violence (e.g., murder), stealing, and sex offenses (see discussions on Syariah law by Rahman (2014); Minister of Religious Affairs 2014 and discussion on drug laws in Southeast Asia by Leechaianan and Longmire (2013)). Recidivism is a problem that deserves further research in Brunei. The many available intervention programs that appear feasible for use in Brunei to reduce the problem include the Sex Offender Treatment Program (SOTP) (Ho and Ross (2012) and crime prevention strategies (Harrower 2001). Re-integration problems such as labeling and stigma as well as access to education, training, and employment also need to be addressed (LeClair 1988; Sherman et al. 1998; Harrison and Schehr 2004; Aba-Afari 2011). Lipsey (1992) and Home Office Research Study 171 (1997) found that young ex-convicts who did not receive rehabilitation intervention while in prison or in the community were more likely to re-offend compared to those who received such help.

Conclusion

Evidence from the present study suggested that a number of demographic variables, psychopathic personality factors, and mental health disorders that we investigated were related to offending and re-offending on five broad types of crime committed by inmates in our Brunei sample. Among the demographic variables, gender, age, the inmates' marital status and marital status of the inmates' parents were significant predictors of criminality. The significant psychopathic personality predictors of the different crime types were interpersonal and affective (stealing-related offenses), interpersonal and affective (drug-related offenses), interpersonal (sex-related offenses), and interpersonal (violence-related offenses). For mental health, the best predictors of criminality were depression and psychoticism (stealing-related offenses); depression, hostility, and psychoticism (drug-related offenses); psychoticism (sex-related offenses); and depression, paranoid ideation, and psychoticism (violence-related offenses). With regard to criminal recidivism, the main significant contributing factors were male gender and inmates with married parents (while other variables with high odds included age-group 30–35, inmates with primary education, affective, lifestyle, antisocial, interpersonal sensitivity, depression, paranoid ideation, and psychoticism). Future research which incorporates interviews with probes and appropriate interventions to address the crime problems are recommnded.

Limitations of the Study

The present study was informed by three main limitations. First, we did not include interviews with probes to gain additional insights on the participants. Second, the study did not include adults with criminal backgrounds who were on rehabilitation interventions at the Bureau for Narcotics and young offenders below 18 years of age who were under rehabilitation treatments in the country's two juvenile correctional centers. Third, we did not have a comparison or control group of normals from the population with whom the psychopathic personality and mental health scores of inmates could be contrasted. We have recommnded future research to address these concerns. Despite these shortcomings, the study's findings have practical significance relevant to policy-makers and researchers.

Acknowledgements We thank the editor and all the anonymous reviewers for the interest shown in our paper and the constructive suggestions accorded to us that helped to improve the article.

Authors' Contributions Each author made contributions to the study, saw, and approved the final version of the manuscript submitted.

Compliance with Ethical Standards

Funding This study was supported by Grant No. UBD/PNC2/2/RG/1(232) dated 23 May 2012 from the Centre for Advanced Research, Universiti Brunei Darussalam, Brunei.

Conflict of Interest The authors declare that they have no conflict of interest.

Ethics Approval and Consent to Participate Permission to conduct the study was obtained from the University of Brunei Darussalam Ethics Committee and the Prison Department Ethics Committee. Each respondent gave a verbal consent/agreement for participating and being involved in the study.

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