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Homicide, Rape and Carnal Abuse in Jamaica, 1970-2013: The New Health Pandemics

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ABSTRACT: ***Introduction:*** *The issue of rape and carnal abuse is a major crime usually determined and studied by forensic science. The aforementioned, though not yet established empirically in Jamaica, along with homicide, is the basis for this study.* ***Objective:*** *This paper evaluates homicide, rape and carnal abuse, along with changes in those figures, over a four decade period.* ***Materials and methods:*** *Forty-four years of panel data were used for this study. Data were recorded, stored and retrieved using the Statistical Packages for the Social Sciences for Windows, Version 21.0.* ***Results:*** *Over the studied period (i.e., 44 years), on average, 778 ± 465 people (95% CI: 626-931) were murdered in Jamaica compared to 1,062 ± 333 (95%CI: 952-1,171) who were raped or carnally abused. For the same period, on average, 2.1 ± 1.3 (95%CI: 1.7-2.6) people were murdered on a daily basis and 2.9 ± 0.9 (95%CI: 2.6-3.2) were raped or carnally abused. In the 1970s, on average, 209 ± 83 people were murdered i n Jamaica, which rose by 653.4% in the decade of 2000 (to 2,004 ± 3.2; 95%CI: 2,002-2,007). Comparatively, on average, absolute rape and carnal abuse for the decade of the 1970s and 2000s rose by 118.4%. 2.1 ± 1.3 (95%CI: 1.7-2.6) people were murdered on a daily basis and 2.9 ± 0.9 (95%CI: 2.6-3.2) were raped or carnally abused.* ***Conclusion:*** *The rape and carnal abuse phenomenon cannot be taken lightly anymore as the psychopathology to the matter is both current and long lasting. Undoubtedly, rape and carnal abuse are critical health matters that should not be studied only by criminologists as there are related mental health matters and other psychopathological aspects to these phenomena.*

Key words: *Carnal abuse, homicide, murder, rape, sexual abuse, sexual homicide, sexual murder, violence, Jamaica*

INTRODUCTION

The issue of rape, carnal abuse and sexual homicide is a major crime usually determined and studied extensively in forensic sciences (Chan et al., 2011; Koch et al., 2011; Henry, 2010; McNamara & Morton, 2004; Myers et al., 1998; Gratzer & Bradford, 1995). While rape and/or carnal abuse cases are normally brought to law enforcement officers, its determination or proof is predicated upon specimen and/or proof of penetration (Enos et al., 1986; Bishop, 2008). Sometimes the matter begins through an identification of anorectal injuries of a child (Orr et al., 1995), vaginal penetration or on conclusion of a forensic inquiry that anal and vaginal dilation has resulted. There have been anal dilation cases following postmortem investigations (McCann et al., 1996) or forceful penetration of the individual's body cavity (Salfati & Taylor, 2006), which would be adjudged as sexual abuse.

The matter of rape and/or sexual abuse is sometimes committed with other crimes, multiple modalities of crimes. Criminologists and other scholars have been arguing for some time that rape is associated with other violent crimes such as homicide (Marriner, 1992; Wilson & Seaman, 1996; Chan, 2012), which is a behavioural approach to the discourse of sexual crimes (Ressler, Burgess, & Douglas, 1988). Using criminal data for eight states in US, DeLisi (2014) established that 1) homicide and rape were statistically related and 2) path regression showed that "…rape had a significant and robust association with multiple murder" (p. 420). DeLisi's work (2014) sets the foundation that rape and homicide are related and that the matter of forensic science has some of its tenets in the social sciences, particularly criminology. Using empirical data, DeLisi established a sociological framework that there is a significant statistical correlation between homicide and sexual crimes (see also, Knight et al., 1998). However, rape or carnal abuse extends beyond criminology and forensic science to the area of public health.

According to Bishop (2008), "Carnal abuse is committed when a male person has sexual intercourse with a female person who is under the age of consent which is 16". Undoubtedly, this can be considered a violent act against a female. Violent acts, among them being rape, carnal abuse and homicide, are subsets of public health and in fact the World Health Organization (WHO) in 2002 dedicated an entire publication to violence (Krug et al., 2002). Despite the efforts of the WHO in promoting scientific inquiries into violence from a public health vantage point (WHO, 2014a), sexual homicide is still narrowly studied by public health practitioners in the English-speaking Caribbean, especially Jamaica that has a high homicide rate. The reality is, there are sexual homicides, sexual murder, sex-related homicide (Hill et al., 2012; Connery, 2013; Radojevic et al., 2013) as well as intimate partner femicide (Abrahams et al., 2013; Black, 2011; Stockl et al., 2013).

Rape is not only a vicious crime perpetrated against another, it is violating an individual's human rights and trampling on the core

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of his/her well-being, including psychological status. The matter of sexual assaults is not only typical to Jamaica as Connery (2013) opined that its rates are high in America. In fact, Connery asserted that "Sexual assault occurs at alarming rates in America" (p. 355), which is no different in Jamaica. In 2012, statistics from the United Nations Office on Drugs and Crime (2014) indicated that the rate of rape in USA was 26.6 per 100,000 compared to 34.1 per 100,000 in Jamaica. Jamaica was listed as the second leading nation in the world as it relates to the rape rate compared to the United States of America being 9, and this speaks to the extent of the alarm in Jamaica.

Jamaica is among the top 10 most murderous nations in the world per capita (UNODC, 2013, 2011; Institute of Economics and Peace, 2014; Bourne et al., 2012; Bourne et al., 2012; March & Bourne, 2011), with homicide rate in 1970 being 0.4 per 100,000 mid-year population and 44.2 per 100,000 mid-year population in 2013 (Annex Table 1A). Based on the UNODC data, which ranked Jamaica as 6th in the top 10 most murderous nations in the globe, the figure was 39.3 per 100,000 and this is less than the actual value of 44 per 100,000 (Institute for Economics and Peace, 2014) and so the nation should have been in the fourth most murderous society in the world. This research concurs with Wilbanks'study (1979, p. 115) that the UN's figures on homicide are invalid (or incorrect) and that the state of murders are far worse than UNODC presents. Inspite of the UNODC figures on homicide in Jamaica, the violence epidemic in this society and those societies in the top 10 most murderous nations go beyond homicide to include rape and carnal abuse to which less attention is placed.

There are clear indications that the rates of rape and carnal abuse in Jamaica are under-reported. As Connery (2013) expressed that the rape issue in America is alarming, sexual abuse in Jamaica is merely spoken of in terms of its extent in the world. The rape and carnal abuse matter is also a case in Jamaica as 2012 statistics revealed that

Annex Table 1A.

Year	Annual absolute Homicide	Annual absolute Rape & Carnal Abuse	Daily Homicide	Daily Rape & canal abuse	Mid-Year Population	Homicide Rate per 100 000	Rape & Carnal Abuse Rate per 100 000	Rape/ Homicide ratio	Rapes every 10 hours
1970	152	429	0.4	1.2	1,869,100	8.1	23.0	2.8:1	0.5
1971	145	553	0.4	1.5	1,901,100	7.6	29.1	3.8:1	0.6
1972	170	544	0.5	1.5	1,932,400	8.8	28.2	3.2:1	0.6
1972	227	671	0.6	1.8	1,972,000	11.5	34.0	3.0:1	0.8
1974	195	460	0.5	1.3	2,008,000	9.7	22.9	2.4:1	0.5
1975	266	540	0.7	1.5	2,042,700	13.0	26.4	2.0:1	0.6
1976	367	672	1.0	1.8	2,096,800	17.5	32.0	1.8:1	0.8
1977	409	ND	1.1	0.0	2,123,500	19.3	ND	ND	ND
1978	381	ND	1.0	0.0	2,149,900	17.7	ND	ND	ND
1979	351	ND	1.0	0.0	2,172,900	16.2	ND	ND	ND
1980	899	767	2.5	2.1	2,133,200	42.1	36.0	0.9:1	0.9
1981	490	756	1.3	2.1	2,162,300	22.7	35.0	1.5:1	0.9
1982	405	893	1.1	2.4	2,200,100	18.4	40.6	2.2:1	1.0
1983	424	825	1.2	2.3	2,240,800	18.9	36.8	1.9:1	0.9
1984	484	892	1.3	2.4	2,279,800	21.2	39.1	1.8:1	1.0
1985	ND	858		2.4	2,311,100		37.1		1.0
1986	449	910	1.2	2.5	2,335,800	19.2	39.0	2.0:1	1.0
1987	442	1,007	1.2	2.8	2,350,800	18.8	42.8	2.3:1	1.1
1988	414	1,118	1.1	3.1	2,356,400	17.6	47.4	2.7:1	1.3
1989	439	1,091	1.2	3.0	2,374,900	18.5	45.9	2.5:1	1.2
1990	542	1,006	1.5	2.8	2,403,000	22.6	41.9	1.9:1	1.1
1991	561	1,091	1.5	3.0	2,425,500	23.1	45.0	1.9:1	1.2
1992	629	1,108	1.7	3.0	2,448,200	25.7	45.3	1.8:1	1.3
1993	653	1,297	1.8	3.6	2,434,800	26.8	53.3	2.0:1	1.5
1994	690	1,070	1.9	2.9	2,459,400	28.1	43.5	1.6:1	1.2
1995	780	1,605	2.1	4.4	2,488,100	31.3	64.5	2.1:1	1.8
1996	925	1,797	2.5	4.9	2,515,400	36.8	71.4	1.9:1	2.1
1997	1,037	1,535	2.8	4.2	2,540,300	40.8	60.4	1.5:1	1.8
1998	953	1,420	2.6	3.9	2,563,700	37.2	55.4	1.5:1	1.6
1999	849	1,261	2.3	3.5	2,581,800	32.9	48.8	1.5:1	1.4
2000	887	1,304	2.4	3.6	2,589,400	34.3	50.4	1.5:1	1.5
2001	1,191	1,218	3.3	3.3	2,604,100	45.7	46.8	1.0:1	1.4
2002	1,045	1,145	2.9	3.1	2,615,200	40.0	43.8	1.1:1	1.3
2003	975	1,308	2.7	3.6	2,625,700	37.1	49.8	1.3:1	1.5
2004	1,471	1,269	4.0	3.5	2,638,100	55.8	48.1	0.9:1	1.4
2005	1,674	1,072	4.6	2.9	2,650,400	63.2	40.4	0.6:1	1.2
2006	1,340	1,142	3.7	3.1	2,663,100	50.3	42.9	0.9:1	1.3
2007	1,574	1,106	4.3	3.0	2,675,800	58.8	41.3	0.7:1	1.3
2008	1,601	1,459	4.4	4.0	2,687,200	59.6	54.3	0.9:1	1.7
2009	1,680	1,175	4.6	3.2	2,695,600	62.3	43.6	0.7:1	1.3
2010	1,428	1,485	3.9	4.1	2,695,543	53.0	55.1	1.0:1	1.7
2011	1,125	1,336	3.1	3.7	2,699,838	41.7	49.5	1.2:1	1.5
2012	1,095	1,715	3.0	4.7	2,707,805	40.4	63.3	1.6:1	2.0
2013	1,200	ND	3.3		2,714,734	44.2			ND

Source: Economic and Social Survey of Jamaica, various years
Note: Daily figures, rate/homicide ratio, number of rapes every 10 hours and rates were computed by Paul Andrew Bourne
ND denotes no data.

the country is ranked number two in the top five nations with the most rape cases in the world (UNODC, 2013) – 34.1 per 100,000 mid-year population. Generally, with homicide exceeding the absolute cases of hypertension, and ischaemic heart diseases in Jamaica (Table 1) and hypertension and ischaemic heart diseases being among the 10 leading causes of mortality in Jamaica, undeniably, homicide, along with rape and carnal abuse, must be squarely placed among the top issues in public health. The aforementioned perspective is even more vividly expressed by empirical establishment that homicide is statistically related to health (Bourne, 2012; Bourne & Solan, 2012). Bourne, Solan, Sharpe-Pryce, Drysdale & Fearon (2012) having argued for the inclusion of the exchange rate in the discourse of public health, particularly as a result of strong correlation with homicide (R2= 0.737), and within the context that the rates of rape and carnal abuse have been more alarming than homicide, an examination of homicide and rape or carnal abuse rates would be fitting at this time.

According to Radojevic et al. (2013), "The correlation coefficients between multiple stabbing and sex-related homicides regarding gender are all near 0.9. For female victims, all homicides committed by 25 and more stab wounds were found to be sex-related. Statistically, jealousy was the most frequent motive for sex-related multiple stabbing homicides" (p. 502). We can deduce from Radojevic's findings that there is a psychopathology to sexual abuse. Sexual abuse is not merely the act of personal invasion of one's human rights, it is the invasion of the psychology of the individual as well as the pathology. In fact, unlike homicide, rape and/or carnal abuse psychologically influence the victim's behaviour now and in the future. There is no denying that both homicide and rape (and carnal abuse) are critical aspects to public health, particularly mental health. Consequently, a study of homicide and rape should be of interest to public health practitoners including those in and outside the area of mental health.

A review of Pubmed and other online academic sites did not unearth a single research that has studied rape and carnal abuse along with homicide in the English-speaking Caribbean. Outside of the Caribbean, no study emerged that has used 44 years of panel data to evaluate those phenomena as well as provide an outlook and a statistical correlation between rape or carnal abuse and homicide.

Empirical Framework

The use of econometric analysis in regression, has been widely used in social science research to establish factors influencing a single dependent variable. Regression analysis has been employed in crime research (Becker, 1968) as well as divorce research (Musai, Tavasoli, & Mehrara, 2011; Bourne et al., 2015). DeLisi's work (2014) has already established the sociological and statistical premise for linking rape and homicide, and therefore the use of econometric analysis is fitting for such discourse. For this study, Bourne et al.'s work (2015) is employed because they examined factors that influenced homicide, marriage and divorce rate, with divorce and marriage rates being factors of homicide. Bourne et al.'s empirical work can be captured in three equations below:

$$Dt = k + \beta 1Popt + \beta 2GDP\ per\ capitat + \beta 3Ht \quad (1)$$

$$Ht = k + \beta 1Popt + \beta 2Mt + \beta 3Dt \quad (2)$$

$$Mt = k + \beta 1Popt + \beta 2GDP\ per\ capitat + \beta 3Nt + \beta 4L \quad (3)$$

where:

Ht: indicates number of homicide events in time t

Popt: indicates the number of people in the population at time t

Mt: indicates the number of marriages that occurred in time t

Dt: denotes the number of divorces that were granted by the courts in time t

Lt: means the number of deaths that occurred and registered at time t

Nt: indicates the number of net international migrants in time t

k: denotes a constant

For this paper, we will model carnal abuse and/or rape rate and homicide in Jamaica, using 44 years of panel data. Using the data on rape and homicide, the best equation to capture the data is an exponential one (see, eq. (4)):

$$Ht = a.eb.Rt \quad (4)$$

Where $a > 0$, $b > 0$, Rt is rape and carnal abuse rate per 100,000 mid-year population.

MATERIALS AND METHODS

The data for this study were taken from various Jamaica Government Publications including the Demographic Statistics, which provided data on mortality, population, and deaths. Jamaica Constabulary Force and Economic and Social Survey of Jamaica (ESSJ) provided the data for murders, and suicide (Jamaica Constabulary Force, 1970-2013; Planning Insitute of Jamaica, 1968-2013; Statistical Institute of Jamaica, 1968-2013). The period for this work is from 1970 through to 2013. Data were recorded, stored and retrieved using the Statistical Packages for the Social Sciences (SPSS) for Windows, Version 21.0. The level of significance that is used to determine statistical significance is less than 5% (0.05) at the 2-tailed level of significance. Ordinary Least Square (OLS) regression was used to determine whether rape and carnal abuse rate is a factor of homicide as well as the strength of the relationship, using R2.

Operational Definitions

Homicide (or Murder): unlawful killing (a crime causing death without a lawful excuse) by other person(s) within a particular geopolitical zone (excluding police killings).

Rape: According to Bishop (2008), "Rape, however, is when a man has sexual intercourse with a woman without her consent, that is, by fear, force or fraud. Any man may be indicted for rape of any female of any age. Carnal abuse is, therefore, different from rape."

Carnal abuse: According to Bishop (2008), "Carnal abuse is

Table 1.
Deaths caused by selected non-communicable diseases and homicide in Jamaica, 2005-2012.

Characteristics	Absolute Numbers of death by Year							
	2005	2006	2007	2008	2009	2010	2011	2012
Diabetes	1 857	1 696	1 688	1 709	1 779	2 047	2 266	2 177
Hypertension	888	907	1 067	1 037	1 098	1 079	1 141	1 288
Ischaemic heart diseases	849	1 032	1 092	976	1 078	1 044	1 086	1 065
Malignant neoplams	2 790	2 758	2 883	2 821	3 136	3 102	3 270	3 121
Homicide	1 674	1 340	1 574	1 601	1 680	1 428	1 125	1 095
Mortality (deaths)	**15 209**	**15 321**	**16 614**	**16 445**	**15 243**	**17 007**	**16 926**	**16 999**

Source: In Demographic statistics, various years (i.e. By Statistical Institute of Jamaica)

committed when a male person has sexual intercourse with a female person who is under the age of consent which is 16".

RESULTS

Table 2 presents descriptive statistics on homicide and, rape and carnal abuse for Jamaica from 1970 to 2013. Over the studied period (i.e., 44 years), on average, 778 ± 465 people (95% CI: 626-931) were murdered in Jamaica compared to 1,062 ± 333 (95%CI: 952-1,171) who were raped or carnally abused. For the same period, on average, 2.1 ± 1.3 (95%CI: 1.7-2.6) people were murdered on a daily basis and 2.9 ± 0.9 (95%CI: 2.6-3.2) were raped or carnally abused. A detailed description of what obtains for the studied period is presented in the Annex (Table 2). From information in the Table in the Annex, in 1970, the homicide rate was 8.1 per 100,000 mid-year population, compared to 44.2 per 100,000 in 2013.

Table 3 illustrates descriptive statistics on homicide and, reported rape and carnal abuse cases for four decades ending with 2000. In the 1970s, on average, 209 ± 83 people were murdered in Jamaica, which rose by 653.4% in the decade of 2000 (to 2,004 ± 3.2; 95%CI: 2,002-2,007). Comparatively, on average, absolute rape and carnal abuse for the decades of the 1970s and 2000s rose by 118.4%. The reality of the exponential rise in absolute homicide in Jamaica is expressed in the average daily absolute homicide which increased from 0.7 person to 3.6 people for the decade of the 1970s and 2000s, respectively. Although the rate of increase in the absolute number of rape is slower than that of absolute number of homicide, on average, 3.2 people are either raped or carnally abused. Furthermore, the rate of rape or carnal abuse is greater than the homicide rate in three decades, except the 2000s.

Table 4 shows a summary of parameter estimates and the model for homicide rate (i.e. dependent variable) and rape and/or carnal abuse rate (independent variable). On review of the Table, an exponential function best fits the correlation between homicide rate and, rape and carnal abuse rate (i.e., R2 = 0.429). With empirical evidence showing that a statistical correlation existed between homicide rate and rape and carnal abuse rate (i.e., exponential rate), we can deduce that a 1% change in rape and carnal abuse rate will result in a 42.9% change in homicide rate. Hence, the equation that can be used to express the aforementioned variables is:

$$Ht = a.eb.R \quad (4)$$

or

$$Ht = 5.42e0.037R \quad (5)$$

Where a > 0, b > 0, h denotes homicide rate per 100,000 mid-year population and r is rape and carnal abuse rate per 100,000 mid-year population

LIMITATION OF DATA

The use of secondary data, particularly not having data relating to kidnapping and intimate partner homicide, constricts the analysis of the work and retards more reasoning on the subject matter. In Jamaica, there are cases of unreported carnal abuse and rape but with the absence of empirical research, it is difficult to state the extent of this under-reporting of the data. If we are to use Chan & Heide's work (2009) that showed that between 1% and 4% of rape cases are reported to law enforcement in Britian, Canada and the United States, sexual offenses could be the new plague of the 21st century in Jamaica.

DISCUSSION

Jamaica is well known for many things, among them being a high homicide rate as well as crude rape rates. Despite the coordinated efforts of various stakeholders, including the police, to effectively address the murderous nature of its people, homicide and rape or carnal abuse has not been given equal prominence among the public health dialogue such as diabetes, hypertension, heart diseases, and malignant neoplasms. Statistics show that in 2012, 18.4% of total mortality were by malignant neoplasms; diabetes mellitus was 12.8%, hypertension was 7.6% and Ischaemic heart diseases 6.3%, compared to homicide of 6.4%. While there have been numerous alarms, and rightfully so, on mortality caused by particular non-communicable conditions such as hypertension, malignant neoplasms, heart diseases and diabetes mellitus, homicide

Table 2.
Descriptive Statistics of Homicide and, Rape & Carnal Abuse, 1970-2013

Details	Mean ± SD, 95% CI
Annual Absolute Homicide	778 ± 465, 626 – 931
Annual Absolute Reported Rape and Carnal Abuse	1062 ± 333, 952 – 1171
Homicide Rate per 100,000 population	31.1 ± 16.5, 25.7 – 36.5
Rape and Carnal Abuse Rate per 100,000 population	43.5 ± 10.7, 40.0 – 47.0
Daily Absolute Homicide	2.1 ± 1.3, 1.7 – 2.6
Daily Absolute Reported Rape and Carnal Abuse	2.9 ± 0.9, 2.6 – 3.2

Table 3.
Descriptive Statistics of Homicide and, Rape & Carnal Abuse, decades

Details	1970s	1980s	1990s	2000s
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Annual Absolute Homicide	266 ± 109	494 ± 155	760 ± 184	2,004 ± 3.2
Annual Absolute Rape and Carnal Abuse	553 ± 93	843 ± 62	1,282 ± 305	1,208 ± 91
Daily Absolute Homicide	0.7 ± 0.3	1.3 ± 0.4	2.1 ± 0.5	3.6 ± 0.8
Daily Absolute Rape and Carnal Abuse	1.5 ± 0.2	2.4 ± 0.2	3.7 ± 0.8	3.2 ± 0.7
Homicide rate per 100,000 mid-year pop.	12.9 ± 4.4	21.6 ± 7.4	30.5 ± 6.3	50.7 ± 10.8
Rape and Carnal Abuse rate 1000,000	26.2 ± 10.1	40.0 ± 4.2	53.0 ± 9.9	46.1 ± 4.5

Table 4.
Model summary and parameter estimates of Homicide Rate (i.e. dependent variable) and Rape and/or carnal abuse Rate (independent variable)

Equation	Model Summary					Parameter Estimates		
	R^2	F	df1	df2	*P*	Constant	b1	b2
Linear	0.274	13.57	1	36	0.001	-3.89	0.803	
Quadratic	0.365	10.04	2	35	<0.0001	-59.49	3.446	-0.030
Exponential	0.429	27.10	1	36	<0.0001	5.42	0.037	

is more seen in the discourse of criminology (Wilbanks, 1979) than public health in Jamaica. Such a reality must cease with urgency as the homicide rate in Jamaica for 2013 was 44.2 per 100,000 mid-year population compared to 6.2 per 100,000 in the globe and 25 per 100,000 in Latin America and the Caribbean (Institute of Economics and Peace, 2014; UNODC, 2011, 2013). The violence epidemic in Jamaica (Bourne et al., 2012; Bourne & Solan, 2012; Bailey, 2011; March & Bourne, 2011; Bourne et al., 2014) is not limited to homicide, it extends to and include sexual assaults.

The alarming rate of sexual assault in America (Connery, 2013) is not atypical as a similar scenario exists in Jamaica, Bahamas, and the Grenadines (Laccino, 2014). Unlike Connery (2013) who did not quantity and detailed a rationale for the'alarming rate', this paper addresses the issue. According to statistics from UNDOC, the rape pandemic in Jamaica is worse than that in America as the former is included in the top 5 nations where rape is concerned and the latter is not in the top 5. Jamaica is internationally known for its high homicide rate and in fact the nation is among the top 10 most murderous societies (UNODC, 2011, 2013) and still rape and carnal abuse cases are more than the number of homicide cases.

The reality is, over the studied period (44 years: 1970-2014), homicide rate was 31.1 ± 16.5 per 100,000 mid-year population, which is higher than in many developing nations as well as developed nations. The irony is, rape and carnal abuse rate is 43.5 ± 10.7 per 100,000 mid-year population yet this is not addressed with the same degree of need for urgent attention. Furthermore, in the 1970s, rape and carnal abuse rate was 2 times more than that of the homicide rate (12.9 per 100,000) and this fell to 1.9 times in the 1980s and a further reduction in the 1990s (i.e. 1.8 times) and for the first time in four decades it fell below one to 0.9 in the 2000s. Clearly, the rape and carnal abuse phenomenon is historically worse than that of the homicide phenomenon. There is established statistical link between sexual crimes and fatal injuries and Knight et al., (1998) indicated that such a relationship is positive. The current results disagreed with a linear approach to the discourse of sexual murders found by Knight et al., (1998) as we established a non-linear relationship between homicide and rape or carnal abuse. Whether the relationship is a simple linear one or otherwise, there is empirical evidence indicating bimodal crimes are occurring and that some are relating to sex-crimes. Such findings cannot go unnoticed by public health scholars and health care practitioners. When rape and carnal abuse is contextualized in reference to mortality by particular leading non-communicable diseases in Jamaica such as hypertension, malignant neoplasm, heart diseases and diabetes mellitus, it is consistently more than the absolute number of deaths by hypertension and ischaemic heart diseases.

Based on the current study, in 2012, approximately 5 people were either raped or carnally abused in Jamaica compared to 3.0 who were murdered on a daily basis, yet rape and carnal abuse are spoken less of than homicide. In Jamaica, the reality is, 2 people are raped and/or carnally abused every 10 hours and the matter is even more traumatic as not all the cases are reported; but these experiences are borne by people. According to the data from the WHO (2014b), Jamaica is ranked among the top 5 nations in the world with the highest rapes per 100,000 (i.e., 34 per 100,000 mid-population). However, the matter is even worse than outlined by the World Health Organization when rape and carnal abuse is combined as we computed a rate of 63.3 per 100,000 in 2012. The rape epidemic in Jamaica can be explained another way by comparing it to homicide. In 2012, there were approximately 2 rape and/or carnal abuse cases compared to 1 murder.

The rape and carnal abuse phenomenon is now at an epidemic stage in Jamaica and must be so recognized by public health practitioners and policy makers. Like DeLisi (2014), we found a positive statistical correlation between rape and/or carnal abuse and homicide (R2 = 0.429 or rxy = 0.655). However, we went further than DeLisi (2014) in our examination of the relationship between rape and homicide by rate of change, using graphical information. This paper showed that an exponential function best fits the aforementioned data, suggesting that 1% change in rape and/or carnal abuse results in a greater than 1% change in homicide (see R2 above). It can be deduced from the aforementioned findings that there are multiple violent crimes committed in Jamaica, which concurs with what obtains in the United States (DeLisi, 2014). We can extrapolate that some of the homicides in Jamaica are sexual homicides, which is also the case in Germany (Hill et al., 2012), South Africa (Abrahams et al., 2013), America (Connery, 2013), and Canada (Henry, 2010).

Unlike other studies that have examined rape, we coalesced rape and carnal abuse and are able to produce more empirical interpretations on the matter of sexual violence. The strong bivariate positive statistical relationship between rape or carnal abuse and homicide (rxy=0.655 or 65.5%) offers a clear insight into blood-relation sexual homicide or sexual abuse of children in their homes, which concurs with the literature on the matter in places like Germany (Banaschak et al. 2015), US (Enos, Conrath, & Byer, 1986) and Jamaica (Robinson, 2015; Matthews, 2015).

The challenge that is rarely examined in the Jamaican literature is the anal abuse of children in their homes, which is found in other geographic areas in the world (McCann et al.,1996). There is no literature in Jamaica on the matter, but McCann, et al., (1996) found that among children who had anal dilation, post-mortem showed that 58% of them were boys. With the current paper establishing a strong direct correlation between rape or carnal abuse and homicide, it means that there would be much psychological pressure placed on male-children who are sexually abused by their fathers or step-fathers. Like female-children who were found to be in psychological trauma following being sexually abused (Enos et al., 1986), the male-child(ren) is(are) equally traumatized because of the acts as well as the homosexual phobia in the society. Despite the psychological trauma of sexual abuse of a male child, the law does not define this as carnal abuse in Jamaica (Sexual Offences Act, 2009). The Sexual Offences Act, Section 3 states that "A man commits the offence of rape if he has sexual intercourse with a woman -(a) without the woman's consent; and (b) knowing that the woman does not consent to sexual intercourse or recklessly not caring whether the woman consents or not"(p. 5).

Sher et al. (2006) found that suicide is among the leading cause of death in adolescents and a part of the rationale would be owing to sexual abuse (Gleaner, 2012a). The perspective of Hussey-Whyte (2015) is that "TEN-year-old children, many of them victims of incest and rape, are among the 1.7 per cent (32,000) of the Jamaican population that has tested positive for Human Immunodeficiency Virus (HIV)". Statistics from the Office of the Children's Registry (2012a) revealed that 56.8% of the total number of sexual abuse cases for January-June 2012 were carnal abuse cases of young women and this represents the single largest prevalence of sexual abuse cases (Annex Table 1B). Such information speaks to the rape and carnal abuse phenomena in Jamaica, particularly among adolescents (Annex Table 1C) that is perpetrated by relatives (Miller, 2015), which must be a difficult burden for young women.

Furthermore, Rosenfeld (2008) indicated that in 2004, 47% of aggravated assaults were committed by perpetrators who knew the assailants, including family members. Continuing, some 16% of aggravated assault victims and 12% of homicide victims were attacked by family members (Rosenfeld, 2008, p. 23). Prior to that in 1997, Greenfeld (1997) found that about 5% of sexual assault and 22% of murders were commited by family members, indicating that the victim would have been traumatized by the experience, especially the fact that this was done by a family member (National Crime

ANNEX Table 1B.
Total sexual abuse cases, and breakdown of sex acts reported to the Office of the Children's Registry January–June 2012

Details	Jan. 12	Feb. 12	March 12	Apr. 12	May 12	June 12	Total	% Total
Buggery	5	6	7	10	12	13	53	3.8
Carnal abuse	141	100	96	129	206	124	796	56.8
Exhibitionism	0	2	4	3	2	2	13	0.9
Fondling	31	25	22	33	42	39	192	13.7
Incest	13	6	9	10	17	7	62	4.4
Oral sex	6	10	4	10	16	5	51	3.6
Rape	23	25	25	27	29	26	153	10.9
Total Sexual Offences	205	184	178	245	347	243	1402	100.0

Source: Office of the Children's Registry (2012a)

ANNEX: Table 1C.
Reports received by the Office of the Children's Registry for rape, year and age, 2007–2011

Age	2007	2008	2009	2010	2011	Total	% Total
0	0	0	0	0	0	0	0.0
1	0	0	0	0	1	1	0.2
2	0	0	0	0	0	0	0.0
3	0	0	0	0	0	0	0.0
4	0	0	1	1	1	3	0.5
5	0	0	0	0	0	0	0.0
6	0	2	0	1	0	3	0.5
7	0	1	3	1	2	7	1.3
8	1	2	1	1	2	7	1.3
9	0	1	3	2	6	12	2.2
10	0	3	4	3	2	12	2.2
11	0	5	9	5	8	27	4.9
12	0	9	10	11	23	53	9.7
13	0	11	28	18	42	99	18.1
14	2	11	34	22	44	113	20.7
15	1	12	25	15	42	95	17.4
16	1	5	18	10	35	69	12.6
17	0	3	5	4	10	22	4.0
Unknown	0	8	13	1	2	24	4.4
Total Sexual Offences	5	73	154	95	220	547	100.0

Source: Office of the Children's Registry (2012b)

Victimization Survey, 2015). An example of sexual homicide by a family member is recorded in the literature in Jamaica (Matthews, 2015; Robinson, 2015). According to Robinson (2015) "A senior investigator very close to the probe told The Gleaner an autopsy was conducted on Kayalicia's body this afternoon, and it was determined that she died from shock and haemorrhaging caused by her injuries." Matthews (2015) stated that "The farming community of Newlands, St Thomas, was yesterday rocked to its core following the macabre murder of a 14-year-old girl by criminals who hacked the teenager to death and then dumped her mutilated body metres from her house" and there are other cases prior to this one (The Gleaner, 2012a). This sexual homicide was carried out by the uncle of the victim and another incident was reported of a grand-uncle sexually assaulting his 11-year old relative (The Gleaner, 2012). Sexual assaults perpetrated by family members are also documented in other geo-political areas (Ashimi, Amole, & Ugwa, 2015).

Outside of the sexual murders perpetrated by family members, there are many high profile cases of vicious sexual assaults of adolescents occurring globally, including in Jamaica (Gleaner, 2006a, 2006b, 2011, 2012b; Jamaica Observer, 2014); yet there are no studies on the matter to comprehensively assess and provide a better understanding of the issues. It is the psychological trauma of sexual assault that sometimes produces social deviant behaviours among the adolescents or victims including alcholic consumption and some fall into a chronic state of depression (Illangasekare, Burke, McDonnell, & Gielen, 2013; Bohn & Holz,1996). According to Illangasekare, Burke, McDonnell, & Gielen (2013), women who have experienced intimate partner violence were 5.3 times more likely to be depressed, and abuse drugs. Other studies revealed that women who were victims of intimate partner violence were found to be alcohol and illicit drug abusers (Martin, Beaumont, & Kupper, 2003; Lutz-Zois, Phelps, & Reichle, 2011). Like adults, children who have been sexually abused were more likely to experience somatic, emotional/ psychological trauma (Bohn & Holz, 1996), post-traumatic stress disorder symptoms, other negative affective psychological conditions (Wondie et al., 2011; Campbell et al., 2008; Whiffen & Macintosh, 2005) and alcohol and illicit drug abuse (Ullman et al., 2009; Lalor & McElvaney, 2010).

Alcohol abuse among adolescents and/or children is an expression of the psychological effect of the various traumatic experiences faced by young people to include rape and carnal abuse (Ullman, Najdowski, & Filipas, 2009; Lalor & McElvaney, 2010), which dates back to childhood. Hence, there is a whole psychopathology to the rape and carnal abuse epidemic unfolding in Jamaica, and therefore evidence of withdrawal in children, anti-social behaviour and depression among adolescents are indicators of the mental health challenges experienced by the silent sexually abused youngsters. So when Abel et al. (2012) opined that "Depression in adolescents is often overlooked and misdiagnosed" (p. 494), such perspective are not far fetched as rape and carnal abuse are mostly perpetrated against female adolescents which makes it a psychological silent killer. The act of sexual abuse for any female is psychologically traumatic (Ullman, Najdowski, & Filipas,2009), particularly for children-to-adolescents (Whiffen & Macintosh, 2005) and the matter is even worse when it committed by a family member with physical violence. It is easily understandable that rape and carnal abuse is

creating current and futuristic mental health problems (Zinzow et al., 2008) including the likelihood of being future perpetrators (Glasser et al., 2001).

The issue of being future perpetrators does explain an aspect of the rape and carnal abuse phenomenon from the present findings; however, we believe that deepseeded matter is outside of mental health area. The current findings must be contextualized within the premise of rapists/sex offenders in a lifecourse/criminal course career context, which is well documented in the literature (Mathesius & Lussier, 2014; Lussier & Blokland, 2014; Lussier & Gress, 2014; Lussier & Beauregard, 2014; Tzoumakis, Lussier, & Corrado, 2014). The appetite of Jamaican men to rape women, particularly young females including children speaks to a pscyhological state that has nothing to do with the perpetrators being raped in the past. The previous mentioned perspective can be substantiated with empirical literature. According to Mathesius & Lussier (2014):

First, while most offenders initiated their sexual criminal career in their early adult years (25–35 years) they were typically not arrested until middle adulthood. Second, the covariates for official onset are in line with cost avoidance, but not actual onset. Third, offenders best able to avoid costs were early starters with a conventional background (i.e., employed, absence of a conviction for a non-sex crime), targeting prepubescent children within the family context (Mathesius & Lussier, 2014)

The empirical findings that emerged from Mathesius & Lussier's work (Mathesius & Lussier, 2014) sets a premise for understanding the psychological imbalance of rapists/sex offenders and how the state contributes to the spiralling of rape cases by way of unplanned endorsement of the rapists mindset. Simply put, then, Jamaica's inability to effectively capture and arrest any form of sexual offenders, irrespective of the age of the perpetrators, fosters a mindset within these individual to master and continue with this behaviour. Clearly, the state's apprehension to find sex offenders and prosecute them has created what we now refer to as the pscyhosocial biology of sexual neglect by the state's apparatus to uphold and maintain the law.

Psychosocial biology is applicable in cases, across all social strata, when the sexual offenses exist on a continuous basis in a society because the perpetrators began the sexual acts at an early age and are not effectively punished for the crime at the earliest point. Becker (1968) offered an explanation for people's involvement in criminality when he empirically established factors explain involvement into criminal activity. The factors are the probability of being caught, if caught the conviction, age of respondent, and earning from the involvement into criminal activities, and excluded psychological as well as social biological factors. Hence, the individual learnt the behaviour from an early age and because he was forgiven for the earliest act commited during childhood or early adolescence, he internalizes the forgiveness of his action to be allowable behaviour (Lussier & Blokland, 2014; Tzoumakis, Lussier, & Corrado, 2014). The psychology behind this is called rape adaptation (McKibbin, Shackelford, Goetz, & Starratt, 2008), which comes from the rapists desire to sexually assault females who are at the peak of their fertility (Ghiglieri, 2000; Greenfield, 1997; Kilpatrick et al., 1992; Shields & Shields, 1983, Thornhill & Palmer, 2000; Thornhill & Thornhill,1983).

The irony though is that the behaviour is not encouraged by the forgiver, but the mindset of the perpetrator is to interpret the forgiveness of the low probability of being caught and convicted of first act to be an indication of a behaviour worthy of involvement. It should be noted here that if sexual perpetrato is not punished for the crime when he begins at an early age he develops a mindset to demand more sex the way the future, forceful sexual acts. This new explanation of what occurs in sexual offenses and their high prevalence in a society can be extrapolated from the views expressed by scholars that as the rapist's biology grows and develops from childhood to adolescence and into adulthood, the repeated behaviour which began from childhood, when nurtured by the psychosocial biological environment, fashions into an evolved psychological mechanism (McKibbin, Shackelford, Goetz, & Starratt, 2008). Then later the individual becomes a repeated sex offender and cares not whether the victim is an adult or child (Lussier & Blokland, 2014; Tzoumakis et al., 2014), which is learnt dissidence (Lussier & Gress, 2014) from early aggression (Tzoumakis, Lussier, & Corrado, 2014).

CONCLUSION

This paper has empirically established that rape and carnal abuse have reached an epidemic stage in Jamaica, and there is a moderate bimodal relationship between homicide and rape. The matter of sexual abuse and sexual homicide in Jamaica is worse than published by the UN Office of Drugs and Crime and this reality is destroying the quality of life of the citizenry. In 2012, there were approximately two rape and/or carnal abuse cases for every homicide; yet there is little emphasis on rape matters. The rape and carnal abuse phenomenon cannot be taken lightly anymore as the psychopathology of this matter is both current and long-lasting. The rape and/or carnal abuse epidemic in Jamaica is worse than that of the homicide issue as there are about two rape and carnal abuse cases for every murder, and this socio-psychological health matter requires urgent remedy. We are proposing that rape and carnal abuse must from henceforth be on the lips of all public health practitioners, and policies must be instituted with urgency to address this issue. Undoubtedly, rape and carnal abuse are critical health matters that should not only be studied by criminologists as there are mental health matters therein and other psychopathological aspects to these phenomena that needs the concerted efforts of all stakeholders including legislators, public health and social behaviour change specialists.

There is need for future quantitative studies on intimate partner homicide, intimate partner sexual violence, carnal abuse of boys, intimate partner violence, clinical factors to sexual homicide including mood disorders of perpetrators, causes of sexual homicide, offending perspective of sexual-murder from a mental health standpoint and health consequences and a longitudinal research on the trends of those issues. We are also forwarding that the ways in which statistics on rape and homicide are presented must be disaggregated to include sexual-murder, particularly initimate murders by marital statuses. The rape and carnal abuse phenomenon is of such a psychosocial and public health importance that there is an urgent need to evaluate the under-reporting of the matter in order to comprehend the extent of this psychological-health condition and chart a path for its redress as well as evaluate the psychiatry and psychological state of all sex offenders including those below 12 years old.

A critical input of this study is the answering of the call of DeLisi's proposition to further examine rape and homicide. By answering the call of DeLisi, we have unearthed more than expected and also outlined additional journeys that are left unresearched and require urgent scholastic attention.

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