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SOCIAL PSYCHOLOGY | RESEARCH ARTICLE

Factors associated with the homicide profile of a prison population: Analysis of the Peruvian national census, 2016

Nadia Castillo-Caciano[1], Fabriccio J. Visconti-Lopez[2] and Rodrigo Vargas-Fernández[1]*

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*Corresponding author: Rodrigo Vargas-Fernández, Faculty of Health Sciences, Universidad Científica del Sur, Lima, Peru
E-mail: jrodrigovf1803@gmail.com

Additional information is available at the end of the article

Abstract: To determine the factors associated with the homicide profile of the prison population in Peru. A cross-sectional analytical study was conducted on the data of inmates surveyed in the First National Prison Population Census of 2016. The dependent variable was committing intentional homicide which was constructed from the Peruvian Penal Code and the International Classification of Crime for statistical purposes. To determine the factors associated with the homicide profile, a generalized linear model of the Poisson family with logarithmic link function was used and crude and adjusted prevalence ratios were estimated. A total of 57,866 inmates were included, of whom 6.60% had committed intentional homicide. In addition, some sociodemographic, mental health, social and family environments, and crime characteristics we found to increase the probability of inmates committing intentional homicide. Almost 7 out of 100 inmates committed intentional homicide. Although our findings are based on a prison population, the associated factors reported in our study could be useful for the implementation of strategies to reduce the homicide rate in Peru and for judicial decision-making.

Subjects: Mental Health; Population Health; Epidemiology
Keywords: Homicide; Prison; Prisoners; Factors; Epidemiologic; Cross-Sectional Studies; Peru

1. Introduction

Homicide is a social problem, defined as illegal assault on a person with the intention of causing death or serious harm, and is divided into intentional or negligent homicide according to the intention to commit the crime (UNODC, 2019). Involuntary manslaughter occurs incidentally, while intentional homicide is premeditated. Intentional or involuntary homicide is a public health problem that has a negative impact on mental health, and the economic and socio-occupational situation of the families of homicide victims (UNODC, 2019). In addition, homicide perpetrated with intent generates an increase in premature deaths because the victims are usually killed in early stages of life such as adolescents and young people; Martinez-Schnell & Waxweiler, 1989). This problem leads countries to strengthen prevention against homicide by the enforcement of laws and criminal justice, citizen security technologies, identification of risk factors, promotion of cultural changes, strategies to reduce violence and increasing evidence-based strategies related to the perpetrators.

Although the sustainable development goal 16.1 seeks to reduce violence and deaths related to violent acts (Bali Swain & Yang-Wallentin, 2020) around the world, in 2017, the rate of intentional homicides was 6.1 victims per hundred thousand inhabitants (UNODC, 2019). In Latin America and

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the Caribbean (LAC), the proportion of homicides increased from 29% to 39% between 2000 and 2017, being the region with the highest homicide rate in the world (Alvarado & Muggah, 2021). These high homicide rates in LAC may be influenced by government inefficiency and acts of corruption that increase socioeconomic inequalities and increase the risk of committing homicide in the population due to the lack of development of citizen security and economic policies, and training of police personnel in the countries (Chainey et al., 2021). Therefore, prevention programs consistent with the economic and social limitations of this region have been developed and are linked to the control of risk and protective factors, integrated strategies to reduce violence, reintegration, mediation or negotiation with the perpetrators, the promotion of cultural changes and improvement of the judicial system (Cano & Rojido, 2012).

South America had one of the highest rates of homicide victims (24.2 per 100,000 inhabitants) around the world in 2017, with Colombia, Brazil and Venezuela being the countries with the highest homicide rates (UNODC, 2019). In Peru, there was an increase of 650 homicides between 2011 and 2015, which may be influenced by the high prevalence of criminality and citizen insecurity coupled with inefficient government policies (Consejo Nacional de Política Criminal, 2017). The increase in the number of homicides generates an increase in the number of inmates in prisons, who often live in unfavorable conditions (overcrowding, scarcity of disease prevention and treatment programs; Hernández-Vásquez & Rojas-Roque, 2020) and can generate a high burden of disease and problems of reintegration into society. This is even more notable, when inmates who commit some type of intentional homicide have a custodial sentence of not less than six years or more than 20 years, or among those with a life sentence (De la República, 2017), which translates into prolonged stay in these centers. Therefore, Peruvian government institutions proposed to implement strategies to prevent citizen security problems through the National Citizen Security Plan 2019–2023, which seeks to strengthen criminal investigation and implement technologies for police investigations (MININTER, 2018) and reduce the crime rate (such as intentional homicide) that generates a negative impact on the economic and social development of the country.

Several authors have evaluated the risk factors of the homicide profile in various regions of the world. The main factors are the age group of 18–49 years, male sex compared to female sex, low educational level or illiteracy, alcohol consumption, illicit drug trafficking, use of weapons and the place where the homicide occurred, all of which increase the probability of committing intentional homicide (Fatoye et al., 2010; Gutiérrez, 2016; Koch et al., 2011; Orellana et al., 2014; Tardiff, 1985). Within the homicide prevention programs developed in various countries around the world, knowledge of the risk and protective factors of homicide allows the creation of strategies to reduce violence and the negative consequences of homicide in society (Kim & Merlo, 2021). Although homicide is a prevalent and persistent problem in the countries that make up LAC, there is little scientific evidence on the factors associated with homicide in this region. This is especially of note taking into account that people residing in LAC have a high prevalence of illiteracy, poverty, and violence (Müller, 2018). In Peru, the homicide rate is increasing and research on this social problem is still scarce since the only information available on the prison population is the First National Prison Population Census (PCNPP-acronym in Spanish). Therefore, the objective of the present study was to determine the factors associated with the homicide profile using the 2016 PCNPP.

2. Materials and methods

This was an analytical cross-sectional study of the data obtained from the PCNPP 2016, which was conducted by the National Institute of Statistics and Informatics (INEI-acronym in Spanish) together with the Ministry of Justice and Human Rights, and the National Penitentiary Institute (INPE-acronym in Spanish) in April 2016 (Instituto Nacional de Estadística e Informática, 2016a). The PCNPP collected statistical information on demographic characteristics, criminal behavior, living conditions within prisons and the performance of institutions among adults confined in penitentiary centers (Instituto Nacional de Estadística e Informática, 2016a). The inmates' information was collected through face-to-face surveys on electronic devices (Tablets) by INEI trained

staff in each of the penitentiary establishments. The census survey consisted of 173 questions validated by the Ministry of Justice and Human Rights, the Ministry of Culture and the INEI. The interviewers received prior training before performing the census, and a pilot test was carried out in 30 inmates from the Lima and Huacho penitentiary establishments. The results of this pilot test allowed sensitizing the prison population and evaluating the understanding of the questions and establishing the approach and the type of language that should be used during the interview. Security protocols were carried out together with the INPE within the penitentiary centers to safeguard the interviewers and the information of the electronic devices (Instituto Nacional de Estadística e Informática, 2016a).

The dependent variable was committing intentional homicide. This outcome variable was constructed from the variable "CRIME_SPECIFIC" of the PCNPP database, which reports the crimes for which inmates were prosecuted or sentenced. Based on the intentionality of the crime, our variable was categorized as "1", when the inmate was prosecuted or sentenced for intentional homicide, and "0", when the inmate committed other types of crimes (i.e., non-intentional homicide, aggravated robbery, abortion, among others). The selection of crimes that make up intentional homicide was based on the International Classification of Crime for Statistical purposes (ICCS; Muhson, 2013) and the specifications of the Peruvian Penal Code (De la República, 2017). Thus, category "1" (intentional homicide) included crimes such as aggravated homicide-murder, simple homicide, patricide, serious injury (followed by death), femicide and homicide by violent emotion, while crimes that did not correspond to this definition were excluded.

The independent variables were selected based on their use in previous studies in the literature (Fatoye et al., 2010; Gutiérrez, 2016; Koch et al., 2011; Orellana et al., 2014; Tardiff, 1985). These included sociodemographic characteristics: sex (male, female), age (in years), marital status (single, married/cohabiting, separated/widowed/divorced), educational level (no education, primary, secondary, higher), work before imprisonment (yes/no), and previous imprisonment (yes/no); mental health characteristics: diagnosis of depression before imprisonment (yes/no), diagnosis of anxiety before imprisonment (yes/no), consumption of alcohol before imprisonment (yes /no), and drug use before imprisonment (yes/no); family and social environment characteristics: possesion of children (yes/no), physical abuse in childhood (yes/no), had best friends who committed crimes (yes/no), and family history of imprisonment in a penitentiary center (yes/no); and finally, the characteristics of inmates during the crime: drug and alcohol use six hours before the crime (yes/no), use of weapons at the time of committing the crime (yes/no) and the place the crime was committed (public street/home).

The statistical program Stata 17 (Stata Corporation, College Station, Texas, USA) was used to perform the analyses of the present study. Population characteristics were described using absolute frequencies and proportions. The distribution of the proportions of committing an intentional homicide at the departmental level was carried out with the QGIS program. A bivariate analysis was performed between the dependent variable and sociodemographic, mental health and family and social characteristics using the chi-square test. Crude and adjusted prevalence ratios (aPR) were determined along with their 95% confidence intervals (CI) using a generalized linear model of Poisson family and logarithmic link function. Likewise, the collinearity of the variables entered in the adjusted model was evaluated using the variance inflation factor, with which no collinearity was observed among the variables. A value $p < 0.05$ was considered statistically significant.

3. Results

Out of a total of 76,180 inmates, 18,314 were excluded because of missing data, resulting in a total of 57,866 inmates (75.96% of the total sample) being included in the analysis.

3.0.1. Sociodemographic, mental health, family and social environment characteristics of the inmates

Of the total number of inmates included in the analysis, the majority were male (94.73%), were between 30 and 39 years old (33.04%), were single (49.79%), had a secondary education (59.31%), had worked

(95.48%), and had consumed psychoactive substances such as drugs (75.37%) and alcohol (68.77%) before imprisonment. Only 16.77% had previously been incarcerated, 9.48% had a previous diagnosis of depression and 8.59% of anxiety before imprisonment. Further details of the characteristics of the population included are shown in Table 1. Likewise, Figure 1 shows that the highest proportion of inmates committed intentional homicide in the departments of Lima, La Libertad, the Constitutional Province of Callao and Cusco.

3.0.2. Characteristics of the inmates during the crime

Regarding the characteristics of the crime, Table 2 shows that 20.23% had used a weapon during the crime, and firearms being one of the most common tools used by inmates. In addition, 32.58% of the inmates used psychoactive substances six hours before committing the crime, alcohol being the substance most consumed by the inmates. Finally, 72.72% of the crimes were committed on public streets compared to crimes committed at home (27.28%).

3.0.3. Committing intentional homicide according to inmates' characteristics

Among the inmates, 6.60% had committed intentional homicide. The highest proportions of intentional homicide were found in inmates between 30 and 39 years old (7.26%), and those who were separated, widowed or divorced (7.89%), had a primary education (7.83%), had held a job prior to incarceration (6. 65%), had used drugs before imprisonment (7.17%), had not previously been incarcerated (7.05%), did not have a family member who was in a prison (6.86%), and had a best friend who had committed crimes (7.30%) (Table 1).

3.0.4. Factors associated with the homicide profile

In the adjusted analysis, the probability of an inmate committing intentional homicide was increased by belonging to the age groups of 18 to 29 years (aPR: 1.23; 95% CI: 1.01–1.50), 30 to 39 years (aPR: 1.48; 95% CI: 1.22–1.79), 40 to 49 years (aPR: 1.37; 95% CI: 1.13–1.66), and 50 to 59 years (aPR: 1.28; 95% CI: 1.04–1.57). In addition, being separated, widowed or divorced (aPR: 1.21; 95% CI: 1.06–1.38), not having previously been incarcerated (aPR: 1.52; 95% CI: 1.37–1.68), using drugs before imprisonment (aPR: 1.53; 95% CI: 1.40–1.67), having a best friend who committed crimes (aPR: 1.58; 95% CI: 1.45–1.71), not having a family member who was incarcerated (aPR: 1.11; 95% CI: 1.03–1.19), using weapons during the crime (aPR: 4.56; 95% CI: 4.26–4.87), having consumed alcohol or drugs six hours before the crime (aPR: 1.96; 95% CI: 1.83–2.09) and having committed the crime in a home (aPR: 1.78; 95% CI: 1.66–1.90) increased the probability of an inmate having committed an intentional homicide, while having a secondary education (aPR: 0.86; 95% CI: 0.78–0.96) decreased this probability (Table 3).

4. Discussion

The present study sought to determine the factors associated with the homicide profile of inmates held in Peruvian prisons. It was found that approximately seven out of one hundred of the inmates had been sentenced or prosecuted for committing intentional homicide. This finding is lower than that reported in the U.S. Department of Justice report, which notes that the proportion of inmates sentenced for homicide was 1.8% in September 2020 (U.S. Department of Justice Bureau of Justice Statistics, 2021). Moreover, our finding may be higher than that reported by the Federal Bureau of Prisons, which describes that inmates who had committed homicide, aggravated robbery, and kidnapping offenses corresponded to 3.2% of the entire U.S. prison population in 2022, even though this proportion did not include only inmates who had committed homicide (Federal Bureau of Prisons. Offenses, 2022). Although this figure includes several crimes and not only homicide, our result would exceed the proportion described by this institution. On the other hand, the United Nations Office on Drugs and Crime provided statistical data on the rate of people convicted of intentional homicide in various regions of the world in 2020. In this report, the highest rates of persons convicted of intentional homicide were found in the LAC region (ranging from 0.68 per 100,000 inhabitants in Guatemala to 16.65 in Guyana), while the lowest rates were found in the European region, with the highest rate reported in Bosnia and Herzegovina (2.38 per 100,000 inhabitants; United Nations Office on Drugs and Crime. Intentional homicide, 2020). These rates

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Table 1. Characteristics of the inmates included in the study

Characteristics	Inmates included in the study	Inmates who committed intentional homicide	p-value*
	Absolute frequency (%) (n = 57,886)	Absolute frequency (%) (n = 3825)	
Sociodemographic Characteristics			
Sex			
Male	54,833 (94.73%)	3615 (6.59%)	0.536
Female	3053 (5.27%)	210 (6.88%)	
Age (in years)			
18-29	18,007 (31.11%)	1119 (6.21%)	<0.001
30-39	19,127 (33.04%)	1389 (7.26%)	
40-49	12,275 (21.21%)	831 (6.77%)	
50-59	6042 (10.44%)	368 (6.09%)	
60 or more	2435 (4.21%)	118 (4.85%)	
Marital status			
Single	28,823 (49.79%)	1879 (6.52%)	0.006
Married/cohabiting	25,453 (43,97%)	1661 (6.53%)	
Separated/widowed/divorced	3610 (6.24%)	285 (7.89%)	
Educational level			
No education	1459 (2.52%)	111 (7.61%)	<0.001
Primary	15,331 (26.48%)	1200 (7.83%)	
Secondary	34,330 (59.31%)	2060 (6.00%)	
Higher	6766 (1.69%)	454 (6.71%)	
Work before imprisonment			
Yes	55,271 (95.48%)	3678 (6.65%)	0.038
No	2615 (4.52%)	147 (5.62%)	
Previous imprisonment			
Yes	9710 (16.77%)	429 (4.42%)	<0.001
No	48,176 (83.23%)	3396 (7.05%)	
Mental health characteristics			
Diagnosis of depression before imprisonment			
Yes	5490 (9.48%)	376 (6.85%)	0.450
No	52,396 (90.52%)	3449 (6.58%)	
Diagnosis of anxiety before imprisonment			
Yes	4,973 (8.59%)	314 (6.31%)	0.383
No	52,913 (91.41%)	3511 (6.64%)	
Consumption of alcohol before imprisonment			
Yes	39,808 (68.77%)	2637 (6.62%)	0.813
No	18,078 (31.23%)	1188 (6.57%)	
Drug use before imprisonment			
Yes	43,627 (75.37%)	3126 (7.17%)	<0.001
No	14,259 (24.63%)	699 (4.90%)	

(*Continued*)

Table 1. (*Continued*)

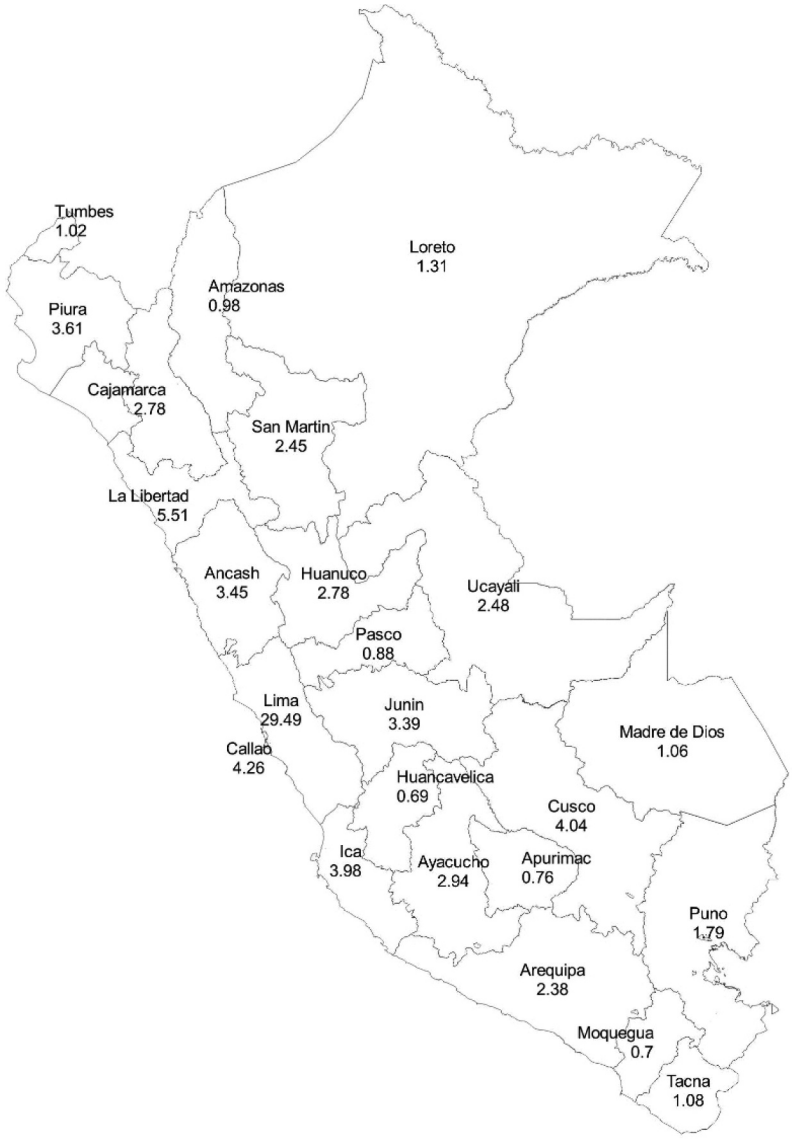
Characteristics	Inmates included in the study	Inmates who committed intentional homicide	p-value*
	Absolute frequency (%) (n = 57,886)	Absolute frequency (%) (n = 3825)	
Familiar and social environment characteristics			
Physical abuse in childhood			
Yes	28,923 (50.03%)	1881 (6.50%)	0.313
No	28,963 (49.97%)	1944 (6.71%)	
Had best friends who committed crimes			
Yes	36,878 (63.71%)	2693 (7.30%)	<0.001
No	21,008 (36.29%)	1132 (5.39%)	
Possession of children			
Yes	43,631 (75.37%)	2880 (6.60%)	0.906
No	14,255 (24.63%)	945 (6.63%)	
Family history of imprisonment in a penitentiary center			
Yes	17,701 (30.58%)	1067 (6.03%)	<0.001
No	40,185 (69.42%)	2758 (6.86%)	

*p-value calculated by the Chi-square test.

may not be comparable with our findings (proportion), but indicate that in the LAC region a greater number of inmates have been convicted of intentional homicide, which could indirectly explain the proportion found in Peruvian prisons. Although our finding is higher than other regions, it is worth mentioning that there are dissimilar definitions of homicide among the regions, with the greatest differences established being based on judicial aspects and statistical terms (Handbook of European Homicide Research, 2012). This problem would result in proportions or rates that could not be comparable between regions. However, our findings expose a challenge for government institutions, especially taking into account that the proportions of people convicted of intentional homicide in 2019 (6.5%) and 2020 (5.9%; Instituto Nacional de Estadística e Informática, 2016b) were similar to the figure reported in our study. In this sense, evidence-based strategies should be implemented to address intentional homicide and promote citizen security.

In this study the departments of Peru in which the highest proportion of inmates committed intentional homicide were Lima and La Libertad, as described in the report of the "Anuario Estadístico de la Criminalidad y Seguridad Ciudadana 2016–2020". In this report, the highest number of charges for committing crimes against life, body and health (which includes homicide) was found in these departments in 2019 (Instituto Nacional de Estadística e Informática, 2016b). Thus, these departments have a high number of crimes related to homicide, which could be extrapolated to the high proportions of inmates who have committed intentional homicide. In addition, the National Police Station Census 2014–2015 reports that the highest number of victims and the highest homicide rate were found in Lima and Trujillo in 2014 (Instituto Nacional de Estadística e Informática, 2014). Our finding could be attributed to the fact that in large cities (such as Lima) there are high rates of extortion, aggravated homicide, drug trafficking and hired killings that promote violent attitudes in the population (Garmendia Lorena, 2016). Despite the existence of punitive laws against homicide, governments have not been able to reduce this problem in Latin American cities due to the inefficiency of government bodies and acts of corruption that increase socioeconomic gaps and the incidence of crime

Figure 1. Proportion of inmates who committed intentional homicide by department level.



(Chainey et al., 2021). Therefore, the main strategies aimed at eradicating crime rates and homicide should focus on cities with higher proportions of inmates who have committed intentional homicide because these figures are indicative of citizen insecurity.

In relation to the factors associated with the homicide profile of inmates in Peruvian prisons, our findings were similar to those reported in studies conducted in Brazil (Orellana et al., 2014), Nigeria (Fatoye et al., 2010), Germany (Koch et al., 2011), Mexico (Gutiérrez, 201609, and the United States (Tardiff, 1985), in which age, marital status, drug or alcohol use during the crime, firearm use, and the family and social environment of the perpetrator were associated with committing intentional homicide. According to the biomedical literature, physiological, psychopathological, social and developmental factors interact with each other and increase the probability of committing homicide (Botelho & Gonçalves, 2016). The physiological factors are related to changes in the functioning of some areas of the brain structure (limbic system, and temporal and frontal lobes) that generate less emotional control and inability to assess the impact of their behavior, which are transformed into attitudes of aggression and violence (Botelho & Gonçalves, 2016).

Table 2. Characteristics of inmates during the crime, PCNPP 2016

Characteristics	Absolute frequency	Proportion
Use of weapons at the time of committing the crime (n = 57,886)		
Yes	11,713	20.23%
No	46,173	79.77%
Type of weapon used (n = 11,713)		
Firearm	9013	76.95%
Edged weapon	2424	20.69%
Others*	189	1.61%
Does not know	87	0.74%
Age at which firearms began to be used (n = 9013)		
Median (IQR)		18 (16–21)
Owned the firearm (n = 9013)		
Yes	4767	52.89%
No	4246	47.11%
Drug and alcohol use six hours before the crime (n = 57,886)		
Yes	18,859	32.58%
No	39,027	67.42%
Psychoactive substance used (n = 18,859)		
Alcohol	15,123	80.19%
Inhaled drugs	1801	9.55%
Marijuana	48	0.25%
Cocaine/crack	1768	9.37%
Pills	84	0.45%
Heroin	7	0.04%
Others**	11	0.06%
Does not know	17	0.09%
Place the crime was committed (n = 57,886)		
Home	15,789	27.28%
Public street	42,097	72.72%

In relation to developmental factors, it is postulated that exposure to dysfunctional family dynamics due to the use of psychoactive substances, child abuse and mental health problems are determinants for the perpetrator to commit homicide (Botelho & Gonçalves, 2016). In addition, perpetrators who commit homicide tend to commit crimes from an early age (adolescence) in a continuous or persistent manner, reflecting enhancement of the development of maladaptive behaviors at a relatively early age (Farrington et al., 2012). Psychopathological factors are related to the presence of serious mental disorders in the perpetrator. It is postulated that when a perpetrator with a serious mental disorder is in a crisis stage or is not adequately controlled, there is a higher risk of committing a violent crime, and individuals with psychotic and personality disorders, mental disability and psychoactive substance use can commit homicide (Flynn et al., 2014). Particularly, drug or alcohol consumption is associated with an increased risk of committing homicide due to the need to maintain a pattern of consumption, loss of self-control and drug trafficking (leading to violent situations; Graham & Wells, 2001). Finally, social or environmental factors are based on the existence of a low socioeconomic level, ethnic heterogeneity (racial problems) and immigration, which lead the individual to a perception of inequality and to commit criminal acts, including homicide (Bursik, 1988). Therefore, the construction of strategies and judicial decisions should consider the factors associated with the profile of

Table 3. Factors associated with the homicide profile in Peru, PCNPP 2016

Characteristics	Crude model		Adjusted model*	
	PR (95% CI)	p-value	aPR (95% CI)	p-value
Sex				
Female	Ref.		Ref.	
Male	0.96 (0.84-1.10)	0.536	–	
Age (in years)				
60 or more	Ref.		Ref.	
50-59	1.26 (1.03-1.54)	0.027	1.28 (1.04-1.57)	0.021
40-49	1.40 (1.16-1.69)	<0.001	1.37 (1.13-1.66)	0.002
30-39	1.50 (1.25-1.80)	<0.001	1.48 (1.22-1.79)	<0.001
18-29	1.28 (1.07-1.54)	0.008	1.23 (1.01-1.50)	0.042
Marital status				
Married/cohabiting	Ref.		Ref.	
Single	1.00 (0.94-1.06)	0.975	0.99 (0.93-1.07)	0.874
Separated/widowed/divorced	1.21 (1.07-1.37)	0.002	1.21 (1.06-1.38)	0.004
Educational level				
Higher	Ref.		Ref.	
Secondary	0.89 (0.81-0.99)	0.026	0.86 (0.78-0.96)	0.005
Primary	1.17 (1.05-1.29)	0.004	1.03 (0.92-1.15)	0.612
No education	1.13 (0.93-1.38)	0.218	1.07 (0.87-1.32)	0.536
Work before imprisonment				
No	Ref.		Ref.	
Yes	1.18 (1.01-1.39)	0.039	1.13 (0.96-1.34)	0.139
Previous imprisonment				
Yes	Ref.		Ref.	
No	1.60 (1.45-1.76)	<0.001	1.52 (1.37-1.68)	<0.001
Diagnosis of depression before imprisonment				
No	Ref.		Ref.	
Yes	1.04 (0.94-1.15)	0.449	–	
Diagnosis of anxiety before imprisonment				
No	Ref.		Ref.	
Yes	0.95 (0.85-1.06)	0.384	–	
Consumption of alcohol before imprisonment				
No	Ref.		Ref.	
Yes	1.01 (0.94-1.08)	0.813	–	
Drug use before imprisonment				
No	Ref.		Ref.	
Yes	1.46 (1.35-1.58)	<0.001	1.53 (1.40-1.67)	<0.001
Physical abuse in childhood				
No	Ref.		Ref.	
Yes	0.97 (0.91-1.03)	0.313	–	
Had best friends who committed crimes				
No	Ref.		Ref.	

(*Continued*)

Table 3. (*Continued*)

Characteristics	Crude model		Adjusted model*	
	PR (95% CI)	p-value	aPR (95% CI)	p-value
Yes	1.36 (1.27-1.45)	<0.001	1.58 (1.46-1.71)	<0.001
Possession of children				
No	Ref.		Ref.	
Yes	1.00 (0.93-1.07)	0.906	–	
Family history of imprisonment in a penitentiary center				
Yes	Ref.		Ref.	
No	1.14 (1.06-1.22)	<0.001	1.11 (1.03-1.19)	0.006
Use of weapons at the time of committing the crime				
No	Ref.		Ref.	
Yes	3.75 (3.54-3.99)	<0.001	4.56 (4.26-4.87)	<0.001
Drug and alcohol use six hours before the crime				
No	Ref.		Ref.	
Yes	1.97 (1.85-2.10)	<0.001	1.96 (1.83-2.09)	<0.001
Place the crime was committed				
Public street	Ref.		Ref.	
Home	1.67 (1.57-1.78)	<0.001	1.78 (1.66-1.90)	<0.001

PCNPP: Primer Censo Nacional de Población Penitenciaria, PR: prevalence ratio; aPR: adjusted prevalence ratio; CI: confidence Interval; Ref.: reference category.

* A generalized linear model with Poisson family with log link function was performed taking into account all variables with a value of $p < 0.05$ in the crude analysis.

the homicide offender in order to reduce exposure to traumatic events that generate persistent criminal behavior.

Likewise, the use of weapons and crimes committed in a home are related to domestic violence. In particular, the biomedical literature indicates that a history of domestic violence, especially against women, predisposes to homicide by a partner or spouse (Bailey et al., 1997). In addition, the presence and use of weapons in the home increases the risk of committing domestic homicide (Bailey et al., 1997). According to the study by Hanlon et al. (Hanlon et al., 2016) the majority of homicide perpetrators who commit homicide in the home have an interpersonal relationship with the victim, suffer from a psychiatric disorder (anxiety, personality disorder or schizophrenia), have a history of psychoactive substance and alcohol abuse, and use a firearm to commit the crime. Therefore, the main focus of the strategies that seek to reduce criminal acts should be aimed at reducing the availability of firearms to anyone in the informal or illegal market and that psychological therapies be carried out to help improve the behavior and attitudes of the homicide perpetrator in their social environment (family, partner, and friends). On the other hand, our study found that the probability of an inmate being sentenced or prosecuted for committing intentional homicide decreased according to the level of educational level (secondary education). This finding is consistent with that reported by a study conducted by Furgan et al. (Furqan & Mahmood, 2020) in an Asian population, which observed that a higher education reduces the probability of committing criminal acts (violent crimes) due to an increase in job opportunities, salaries and, consequently, the socioeconomic level of the person. In addition,

education may develop more responsible and serene attitudes in the individual, which further reduce the commission of criminal acts (Furqan & Mahmood, 2020). In this sense, Peruvian policies should prioritize adequate education in all social spheres, especially in people living in conditions of poverty and who are incarcerated, in order to reduce recidivism of homicide and decrease violent crime in the Peruvian territory.

The present study has some limitations. Causality between variables cannot be established due to the lack of temporality of a cross-sectional study. Also, since this is a secondary data study, there may be errors in the implementation of the census survey by the interviewer and recall or memory biases on the part of the respondent, since it deals with past events that occurred at specific times in the inmate's life, as well as a social desirability bias based on the questions about harmful habits and crime. In addition, some variables such as socioeconomic level, area of home residence before imprisonment, and crimes committed prior to the homicide, were not collected by the census and could contribute to the study of factors associated with the homicide profile. Finally, the definition of homicide did not include all crimes typified in the Peruvian Penal Code because the census only collected information on some crimes that correspond to intentional homicide. However, this study used the PCNPP as a secondary database that included all persons incarcerated in penitentiary centers at the national level and allowed determining the characteristics of this population in Peru. Thus, this study presents preliminary findings on the factors associated with the homicidal profile of the Peruvian prison population. These findings should be further explored in future longitudinal studies on this social problem.

In conclusion, approximately seven out of every one hundred inmates were sentenced or prosecuted for committing an intentional homicide in 2016. Likewise, several sociodemographic, mental health, social and family environments, and crime characteristics increase the probability of inmates committing intentional homicide. Although our findings are based on a prison population, they provide an approximation of the risk factors associated with the homicide profile and will allow the development of strategies focused on improving education and citizen security to help reduce the intentional homicide rate, and its negative consequences on economic and mortality indicators in Peru.

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Author details
Nadia Castillo-Caciano[1]
Fabriccio J. Visconti-Lopez[2]
Rodrigo Vargas-Fernández[1]
E-mail: jrodrigovf1803@gmail.com
ORCID ID: http://orcid.org/0000-0002-3310-8689
[1] Faculty of Health Sciences, Universidad Científica del Sur, Lima, Peru.
[2] Faculty of Health Sciences, Universidad Peruana de Ciencias Aplicadas, Lima, Peru.

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