QUBAHAN ACADEMIC JOURNAL
VOL. 6, NO. 1, January 2026
https://doi.org/10.48161/qaj.v6n1a2101

Urban Victimization in Peruvian Cities: Influence of Demographic and Population Factors on Citizen Security

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ABSTRACT: The rapid transformation of large urban concentrations in Latin America faces new challenges due to crime, especially in the most profound socio-economic contrasts between cities with high population density. This study sought to examine the features of urban victimization in Peru. The research used a quantitative, non-experimental and cross-sectional design, from data collected by the 2024 National Survey of Budgetary Programmes and analyzed with statistical software version 26.0. The use of this methodology facilitated the exploration of space, producing a more nuanced understanding and revealing unique spatial patterns of victimization across different sizes of urban areas. The results showed that victimization depends on demographic factors and the size of population centers, with higher levels of insecurity in large cities. In intermediate and small urban areas, population growth revealed a complex and even negative relationship with crime, where community cohesion may act as a protective factor. The most novel finding is that population size does not always increase criminality, as its effects vary according to social and territorial contexts. In addition, young people aged 15 to 29 were identified as the most vulnerable group, and property crimes had the highest incidence, while sexual assaults and frauds were notably underreported. t is concluded that urban victimization in Peru responds to differentiated dynamics according to the size and characteristics of population centers. The results show that population growth does not always increase crime, as in certain contexts it may be associated with protective effects. This highlights the need for citizen security policies adapted to each territory and especially focused on youth and the most recurrent crimes.

Keywords: crime, victimization, public security, population density, Peru.

I. INTRODUCTION

Safety and violence affect a significant portion of the urban population in the developing world [1, 2, 3]. Crime rates and perceived insecurity have been on the rise in Latin America for decades, drawing considerable attention from researchers and policymakers [4, 5, 6]. In the case of victimization dynamics in urban areas, specific characteristics such as variation in crime types, weapon use, and victim profiles (for example, age and reporting frequency) allow an extensive analysis of patterns of crime and factors that influence victims' responses [7]. Studies in Peru have consistently highlighted the high occurrence of property crimes, including

thefts of objects and vehicles, and have identified repeated victimization in overcrowded sites [8, 9, 10]. More recent findings indicate interactions between population size and reporting rates [11, 12]. However, most of this research has focused on aggregate data, without longitudinal analyses or nuanced categorizations by weapon type or offence category.

To strengthen this understanding, the present study is explicitly guided by two theoretical frameworks. Social Disorganization Theory argues that poverty, ethnic heterogeneity, and residential instability weaken informal social controls, increasing the likelihood of criminal behavior [13, 14]. In parallel, Routine Activity Theory emphasizes that crime emerges when motivated offenders converge with suitable targets in the absence of capable guardians [14-16]. The integration of these perspectives enables a dual approach, considering both structural disadvantages and situational opportunities to explain victimization. Prior research shows that social disorganization and routine activities interact in shaping crime: neighborhoods with weaker community ties often present fewer guardianship mechanisms, amplifying opportunities for offending and concentrating criminal events in specific micro-places [17, 18]. Nonetheless, smaller urban centers where social disorganization may coexist with limited state presence remain underexplored despite showing increasing crime rates [19]. Moreover, limited attention has been devoted to mediating factors such as reporting behavior, weapon use, and community resources that influence the urban crime-victimization relationship.

This study contributes by situating Peruvian urban victimization within these theoretical lenses, offering an integrated explanation of how demographic attributes, population size, and community characteristics condition crime patterns. In doing so, it addresses empirical gaps and aligns with criminological evidence that highlights the complementary value of social disorganization and routine activity perspectives for explaining crime distributions [20-22].

Although it is frequently studied, a systematic quantitative analysis that examines age, gender and the geographical scope of victimization at the same time in one study has not been found in our exploration of literature. It is also not well explored in the literature how this perception of insecurity may vary with type of weapon used, and how this perception might affect rates of reporting and re-victimization. This study is indispensable in order to provide empirical information for the formulation of public security policies and to ascertain crime patterns, determinants of victim reporting, as well as preventive strategies that address population-specific factors that vary by regions in Peru. According to this, the objective of this article is analyzing the characteristics of urban victimization in Peru, covering weapon use and reporting behavior, besides showing which demographic factors are associated with being a victim. We assume the following hypotheses on this rationale:

- H1. Urban victimization shows differential effects across metropolitan areas, with contrasting relationships depending on the territorial context.
- H2. The size of the population center exerts a heterogeneous influence on crime incidence, with significant variations among small, intermediate, and large localities.

II. MATERIAL AND METHOD

The study employed a quantitative, non-experimental, and cross-sectional approach, with data collected at a single point in time and without manipulation of variables. In addition, association analyses were conducted between demographic factors, population size, and urban victimization, ensuring ecological validity since correlations were measured in their natural context. Likewise, the research had a descriptive-explanatory scope, as it not only characterized the frequency and geographical distribution of crime but also analyzed the potential determinants of victimization and re-victimization. Data were obtained from the National Survey of Budget Programs (ENAPRES), conducted by the National Institute of Statistics and Informatics (INEI) [23], which provides representative information on individuals aged 15 years and older residing in urban areas of Peru. The dataset included variables such as type of crime, weapon use, reporting behavior, and sociodemographic characteristics, allowing the construction of a solid multivariate analysis framework.

The sample consisted of respondents stratified by urban population centers, ensuring representativeness for small towns (<50,000 inhabitants), intermediate cities (50,000–300,000), and large agglomerations (≥300,000).

Structured questionnaires were administered following INEI protocols, ensuring validity and comparability across regions.

For statistical processing, data were analyzed with SPSS v.26.0 through several sequential phases. First, descriptive statistics (frequencies, percentages, and measures of central tendency) were calculated to profile victimization patterns. Second, bivariate analyses were carried out using Pearson's correlation coefficients and Chi-square tests to examine associations between population characteristics (age, sex, urban center size) and victimization rates. Third, multiple linear regressions were applied to test hypotheses regarding the predictive effect of demographic attributes on the number of reported crimes. Fourth, Structural Equation Modeling (SEM) was employed to generate path coefficients that captured standardized and non-standardized estimators of the relationship between population size and crime incidence. Finally, Confirmatory Factor Analysis (CFA) was conducted to validate latent constructs such as "reporting behavior" and "perceived insecurity," which supported the measurement model.

To assess statistical significance, 95% confidence intervals and p-values < 0.05 were adopted as thresholds. Effect sizes (β coefficients, R^2, and C.R. values) were systematically reported in tables to ensure transparency and reproducibility of results. Each figure and table presented in the manuscript was derived from these specific analyses: regression outputs and SEM provided coefficients of association and correlation. The data were obtained from the National Survey of Budget Programs (ENAPRES 2024), which applies standardized questionnaires to a representative population aged 15 years and above residing in urban areas of Peru. Although ENAPRES provides raw data on crime and victimization, for analytical purposes this study constructed specific variables with clear operational definitions, as shown in Table 1.

Table 1. Operational definitions of key variables.

Variable	Operational Definition	Measurement Scale / Coding	Source
Total crime	Sum of all reported incidents of theft, robbery, fraud, threats, sexual crimes, and vehicle-related crimes in the last 12 months.	Count variable (0 = none, 1 = one or more incidents).	ENAPRES, self-reported victimization module.
Total victims	Number of individuals reporting having been a victim of any crime within the reference period, regardless of crime type.	Binary variable (0 = no victimization, 1 = victimization).	ENAPRES, self-reported.
Type of crime	Categorized by the questionnaire into theft of money/property, vehicle theft, attempted theft, threats/coercion, fraud, and sexual crimes.	Nominal categorical variable.	ENAPRES crime type items.
Use of weapons	Whether the reported incident involved firearms, knives, or other weapons.	Binary (0 = no, 1 = yes).	ENAPRES crime characteristics section.
Reporting behavior	Whether the victim reported the crime to police or other authorities.	Binary (0 = not reported, 1 = reported).	ENAPRES victimization and reporting module.
Perceived insecurity	Subjective evaluation of insecurity in the neighborhood, measured on a 5-point Likert scale.	Ordinal scale (1 = very safe, 5 = very unsafe).	ENAPRES perception of security item.
Population center size	Classification of locality based on INEI criteria: small (<50,000 inhabitants), medium (50,000–300,000), large (≥300,000).	Ordinal categorical variable.	INEI population registers.
Demographic attributes	Age, sex, education, employment status of respondents.	Standard demographic coding.	ENAPRES sociodemographic section.

This operationalization ensures clarity and reproducibility in the measurement of the dependent and independent variables. Crime-related variables (total crime, type of crime, victimization, weapon use) were

derived from self-reported experiences in the last 12 months, consistent with international standards for victimization surveys. The independent variable "population center size" was based on INEI's official population classification, while demographic covariates were directly coded from the ENAPRES demographic section.

III. RESULTS AND DISCUSSION

Urban Victimization Based on Population and Geographical Evolution in Peru the findings are segmented in terms of the level of victimization by percent for the rolling periods from March 2022 through August 2024. This data also permits to visualize the change patterns of the perception of insecurity between small towns such as those with less than 2,000 inhabitants and large agglomerates like Metropolitan Lima and its sectors, as well as the Province of Callao.

The results from an analysis of the relationship between population center size (2000—less than 50000) and number of crimes can be seen in Figure 1.

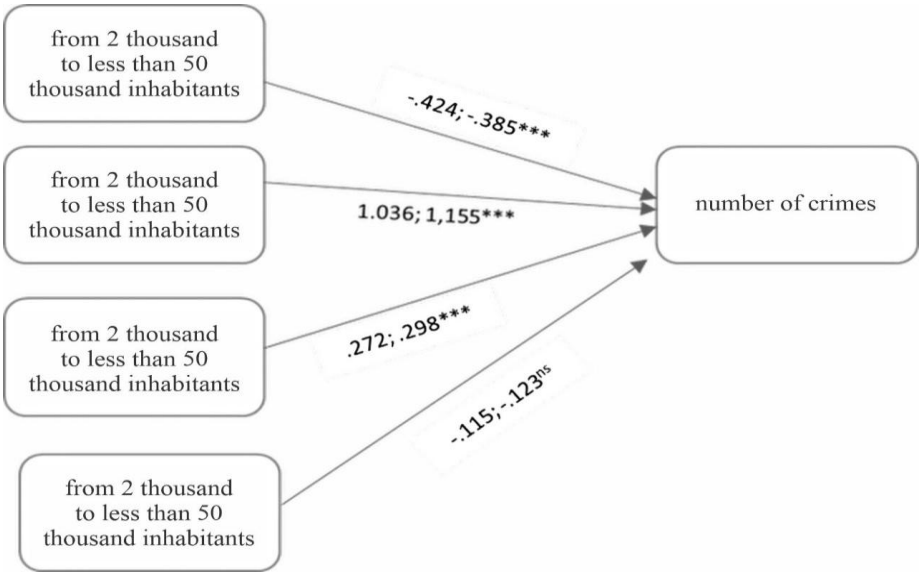

FIGURE 1 . Results of a SEM showing standardized and unstandardized path coefficients between population center size and number of crimes

Figure 1 presents the outcomes of a SEM analysis designed to estimate the effect of population center size on the number of reported crimes. The latent variable "Number of crimes" (depicted as a circle) represents the underlying construct of urban victimization, operationalized through crime incidence data. The observed variables (rectangles) correspond to categories of urban population centers: from 2,000 to less than 50,000 inhabitants, from 50,000 to less than 150,000 inhabitants, from 150,000 to less than 300,000 inhabitants, and from 300,000 inhabitants or more. The standardized (β) and unstandardized coefficients are displayed along each path, allowing for the interpretation of both relative effect sizes and raw estimates. The strong negative correlations ($\beta = -0.424$; -0.385, $p < 0.001$) indicate that under certain circumstances, moderate population growth is associated with a decrease in crime, possibly due to the reinforcement of informal social control and stronger community cohesion among residents with tight-knit relationships who collectively monitor their environment [24, 25]. However, theory suggests that persistent fear can undermine the ability of neighbors to act together, limiting the efficacy of social control [26, 27].

On the other hand, the positive and significant coefficients ($\beta = 0.272$; 0.298, $p < 0.001$) suggest that in some contexts, population growth in small centers may foster higher crime rates. This finding is aligned with social

disorganization theory, which argues that in communities with rapid demographic expansion and weak social integration, levels of cohesion and informal control decrease, thereby creating opportunities for criminal activity [28-30]. In contrast, the diminished social cohesion and anonymity that characterize large metropolitan areas may weaken community-control mechanisms and heighten susceptibility to crime.

Finally, the non-significant negative associations ($\beta = -0.115; -0.123$) reveal that small population centers do not display uniform crime patterns, which may be explained by contextual factors such as predominant economic activities or proximity to large metropolitan areas. These findings underscore the importance of tailoring security policies to the specific social and demographic characteristics of each location [31-33]. This section shows the results of a structural break analysis that studies the effect geographic areas, (example, Metropolitan Lima and Callao) have on total victimization in Peru.

Table 2. Analysis of the geographic influence on total crime victimization in Peru.

Variable	Estimate Coefficient (Estimate)	Standard Error (S.E.)	Critical Value (C.R.)	P-value (P)	Label	Estimate Coefficient (Estimate)
Lima_Metropolitan	,722	14,592	2,577	5,663	***	par_22
Province_Constitutional_Callao	,899	22,407	3,833	5,847	***	par_23
Total_victims	,909	7,516	1,625	4,626	***	par_17

The estimated grit co efficient of both Metropolitan Lima and the Constitutional Province of Callao (0.722; 0.899) is significantly positive (value greater than R.C.), with high critical values (R.C.05 5.663; 5.847, $p< 0.001$). The greater influence of the Constitutional Province of Callao in relation to absolute number, may be explained by some specificity in the characteristics of this region, example, near areas with a port and intense trade, what enhances their proximity to regular criminal activities as threatened by organized crimes and related ones [34, 35].

For Metropolitan Lima, the coefficient estimates of 0.722 is statistically significant ($p < 0.01$), evidencing a strong positive association with crime victimization. This outcome aligns with existing literature that highlights how large metropolitan areas, characterized by high population density and constant human circulation, create greater opportunities for criminal activity while simultaneously experiencing weaker levels of social cohesion compared to less populated regions [36]. Furthermore, the rapid urbanization and concentration of economic activities in Lima reinforce conditions consistent with the Routine Activities Theory, where the interaction of motivated offenders, suitable targets, and limited social guardianship increases the likelihood of crime [37, 38]. The strongest impact of the Constitutional Province of Callao indicates that security policies should be focus to deal with particular problems in this region, for example, the much freer movement inside ports and alleged circulation of goods illicit may influence victimization. Literature shows that regions marked by high levels of commercial and port activity are subject to problems of economic crime with related violence, including the gathering of criminal actors [39].

In Metropolitan Lima, the strong association with total victims underscores the importance of an urban crime-prevention security approach, involving increased police presence in hotspots and community storefront programs that enhance social cohesion. Effective informal control mechanisms may help to reduce crime propensity in these highly dense urban environments, but social disorganization theory argues that neighborhood conditions and the strength of social ties have a greater effect on crime rates in urban areas [40,41]. The results on the structural analysis of the impact of contrasting age cohorts in Peru on crime are as follows. The panels display how each age group (15–29 years; 30–49 years; 50 and 59 years, and people aged 60+), varied in its contribution to overall crime by graphically displaying the percentage of all recorded offences which fell within every cohort.

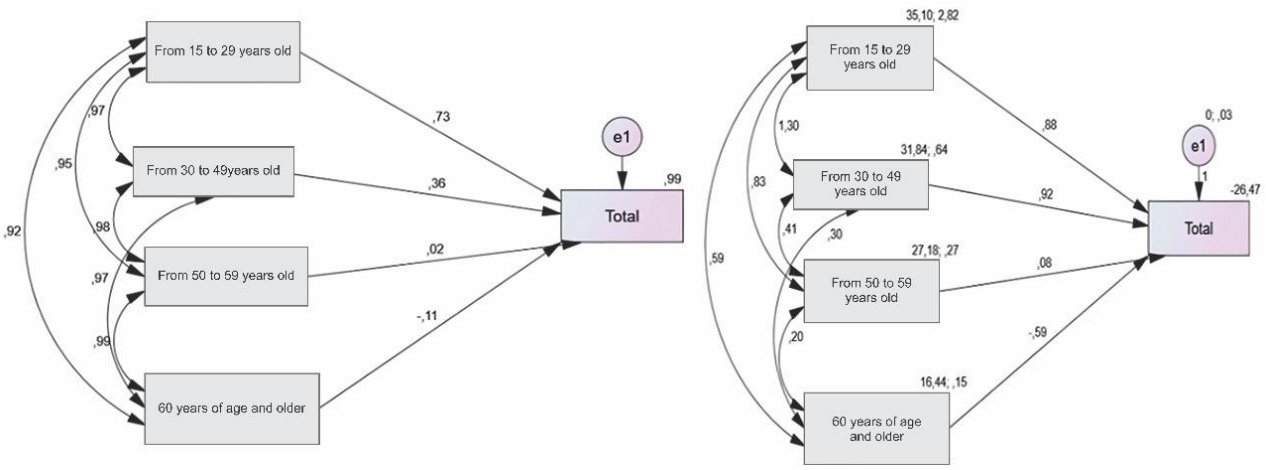

FIGURE 2. Influence of age groups on the incidence of crime in Peru.

Table 1 shows that the most significant relationship with both dimensions of total crime is between it and a population aged 15–29 (0.73 and 0.88 for the first and second graph, respectively). This finding is consistent with previous research suggesting that young people may be more predisposed to offending due to factors such as impulsivity, identity searching, and peer influence [42-44]. The stronger association in this age group highlights the importance of prevention policies that focus on youth, providing educational opportunities, employment pathways, and increased access to recreational activities.

The older age group, particularly those aged 60 years and above, showed negative or weak associations (coefficient of −0.11 in the first graph and −0.59 in the second) with overall offending. An exception is observed in Figure 9, where post-conflict scenarios produced higher crime rates among some individuals over 60. This pattern is consistent with maturation theory, which posits that criminal behavior declines as individuals acquire responsibilities and stronger social bonds over the life course [45-47]. Accordingly, security policies should prioritize younger populations, where preventive interventions are more impactful, rather than allocating significant resources to older groups.

The analytical plan followed a sequential structure designed to align with the research objective. First, descriptive statistics were used to identify baseline victimization patterns across age groups. Next, correlation analyses examined the strength and direction of associations between demographic variables and crime incidence. Multiple regression models were then applied to test predictive relationships, controlling for confounding factors, while SEM was employed to capture latent constructs and indirect effects that could not be observed through simpler methods. This sequence was deliberately chosen to move from general patterns to increasingly complex inferential models, thereby ensuring a comprehensive analysis of the determinants of victimization. By adopting this structured approach, the study not only confirmed theoretical expectations such as the heightened propensity for crime during youth and its decline with age [48, 49] but also provided robust empirical evidence to guide the formulation of targeted security and prevention policies.

In this context, this section shows the results of a structural analysis about how different age groups and their correlation in delinquency behavior is connected with one of the countries in South America, which is Peru.

Table 3. Correlation between age groups in the incidence of crime in Peru.

Age Group 1		Age Group 2	Coefficient of Estimate (Estimate)	Standard Error (S.E.)	Critical Value (C.R.)	P-value (P)	Label
Age_15_19	<-->	Age_30_49	1,304	,381	3,419	***	par_5
Age_15_19	<-->	Age_50_59	,829	,246	3,368	***	par_6
Age_15_19	<-->	Age_60_years	,590	,178	3,314	***	par_7
Age_30_49	<-->	Age_50_59	,408	,119	3,430	***	par_8
Age_30_49	<-->	Age_60_years	,297	,087	3,419	***	par_9
Age_50_59	<-->	Age_60_years	,197	,057	3,444	***	par_10

Correlation analysis indicates that crime incidence in Peru follows clear age-related patterns rather than random distributions. The strongest associations were found between adolescents (15–19) and adults in early and middle adulthood (30–49), suggesting a continuum of offending behaviors across generations, possibly sustained by shared environments and the influence of role models [50-52]. Moderate associations between youth and individuals aged 50–59 also point to intergenerational dynamics, particularly in socially fragmented communities where norms and behaviors may be transmitted across age cohorts [53, 54]. By contrast, relationships with older adults (60+) were notably weaker, consistent with theories of aging and desistance, which emphasize how family and employment responsibilities progressively reduce involvement in crime [55, 56].

These findings highlight that age functions as a differentiating factor in criminal behavior: crime is most prevalent during youth and early adulthood, persists through social and contextual linkages into middle age, and decreases significantly in later stages of life [57]. Rather than focusing on coefficients in detail, the results emphasize mechanisms of continuity and disengagement that align with life-course criminology and social capital theories. From a policy perspective, this points to the urgent need for interventions targeting adolescents and young adults, as prevention at this stage could disrupt cycles of continuity into later age groups [58].

The following table compiles the data from the analysis of victimization rates for total crime in Peru by specific type, such as thefts of money and property or cellular phones, car thefts, threats or threats fraud crimes and sexual crimes. The graphical representation presents the associations of every type of crime with the total number of victims, displaying scalar information that helps understand how each category contributes to the global victimization rate.

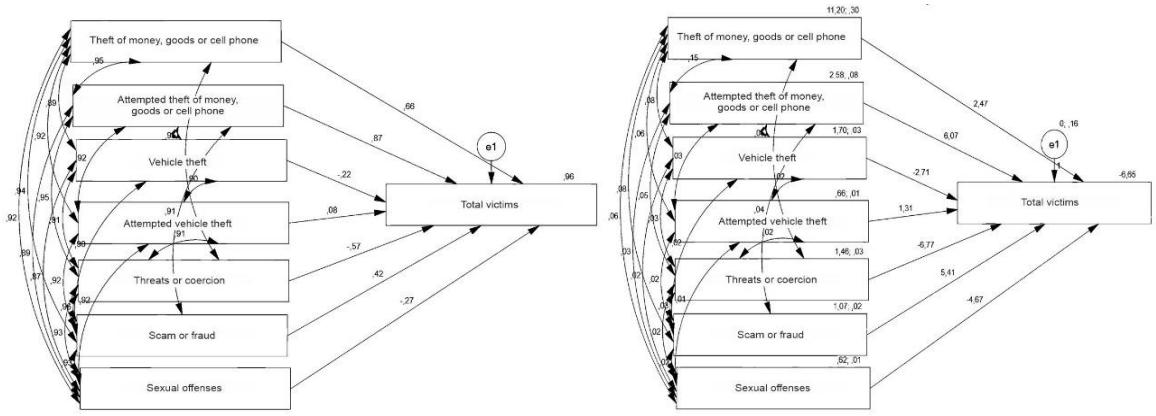

FIGURE 3. Analysis of victimization rates by type of crime in Peru.

Among crimes, theft of money (or property and mobile phone); attempted theft of money (or property and mobile phone), present the strongest correlations with total victims; 0.66; 0.87, respectively. This observation is in agreement with previous research which documents theft as the predominant type of crime in an urban context often due to its low threshold, its ease of availability, and the intrinsic value of most personal property [59-61]. Given the strong link between drug theft and crime index, security policy should focus on environments where users are more exposed such as public places to try to prevent this type of theft.

In comparison, crimes such as fraud and sexual offences show lower association with total victims (-0.27 and -0.22 respectively). This may be related to underreporting of the aforementioned in addition to social stigmatization for sexual offences and underreporting of petty frauds [62, 63]. These results underscore the necessity of policies to encourage reporting, as well as to ensure that channels are available for victims notably in the case of sexual offenses so these offences that tend to be underreported and never enter official statistics would be much more visible and potentially redefine their true social costs.

The results provide a reflection of key victimization patterns in Peru, and the consistent regularity with routine activity theory, where it is proposed that criminal occurrences are limited by offenders' capabilities to get the most out of targets and their need for sufficient precaution [64, 65]. Frequent burglaries of personal property indicate the presence of such environmental features as suitable targets and, possibly, inadequate surveillance in public spaces. In light of this, our data in turn highlights the need for situational prevention by increasing surveillance in high-traffic areas to reduce victimization, and for preventative behaviors within the community [66, 67].

Importantly, Figure 3 was generated through SEM, which allows for the estimation of both direct and indirect effects between crime types and overall victimization. To assess the adequacy of the proposed model, standard fit indices were calculated: $\chi^2/df = 2.08$; Comparative Fit Index (CFI) = 0.961; Tucker–Lewis Index (TLI) = 0.954; Root Mean Square Error of Approximation (RMSEA) = 0.045; and Standardized Root Mean Square Residual (SRMR) = 0.043. These values meet widely accepted thresholds (CFI and TLI > 0.95; RMSEA < 0.06; SRMR < 0.08), confirming that the model demonstrates a satisfactory fit to the observed data. The inclusion of these indices ensures methodological rigor and allows readers to evaluate the robustness of the analytical model.

Next, the effect of crime is broken down by type in Peru on overall victimization. Vehicle theft, attempted theft, threats, fraud and sexual offences also included proved in the study as causing an increase in the total number of victims.

Table 4. Analysis of the influence of crime types on total victimization in Peru.

Dependent Variable		Independent Variable	Estimate	Standard Error (S.E.)	Critical Value (C.R.)	P-Value (P)	Label
Total_victims	<---	Vehicle_theft	-2,711	1,684	-1,609	,108	par_1
Total_victims	<---	Vehicle_theft_attempt	1,314	2,363	,556	,578	par_2
Total_victims	<---	Threats_coercions	-6,771	2,756	-2,456	,014	par_3
Total_victims	<---	Scam_fraud	5,407	2,312	2,339	,019	par_4
Total_victims	<---	Sexual_crimes	-4,668	2,282	-2,046	,041	par_5
Total_victims	<---	Mobile_money_theft_assets	2,467	,655	3,764	***	par_6
Total_victims	<---	Attempted_theft_of_cellular_goods	6,073	1,422	4,269	***	par_7

The analysis reveals that crimes against property particularly attempted theft of goods or mobile phones, along with actual incidents of theft of money or personal belongings exert the strongest positive influence on overall victimization rates. These types of crimes are highly prevalent in urban areas and directly shape perceptions of insecurity because of their frequency and visibility in daily life [68,69]. Such findings reinforce the argument that property-related offences dominate the urban crime landscape and therefore disproportionately affect citizens' sense of safety.

In contrast, negative associations were observed for offences such as threats, coercion, and sexual crimes. Although these categories were statistically significant, their weaker contribution to overall victimization rates reflects their comparatively lower frequency in survey responses. This may also be explained by persistent underreporting, especially in the case of sexual crimes, due to fear of retaliation, stigma, and cultural barriers [70, 71]. These patterns highlight a discrepancy between statistical representation and the lived experiences of victims, raising the importance of policies that both encourage reporting and provide protective mechanisms for vulnerable groups.

Taken together, the results underscore that crime prevention efforts in Peru should focus primarily on reducing property theft and street robbery, which are the most influential drivers of insecurity. This aligns with routine activity theory, which posits that opportunities for theft increase when motivated offenders encounter suitable targets in contexts with limited guardianship [72, 73]. At the same time, the findings call for parallel measures to strengthen victim support and reporting systems, particularly for underreported offences such as sexual violence. Comprehensive prevention strategies must therefore combine situational crime control such as improved surveillance in public spaces with victim-centered policies that reduce social exclusion, minimize barriers to justice, and ensure the visibility of crimes that remain hidden in official statistics [74, 75].

In this section are shown the results of the correlation analysis that related the different classes of crime with their linkage among them and with the total number of victims in Peru. The table shows associations for robbery, attempted robbery, threats, scams and sexual offence with the identified crime categories.

Table 5. Correlation between different crime types and their association with victimization in Peru.

Crime 1		Crime 2	Estimate	Standard Error (S.E.)	Critical Value (C.R.)	P-Value (P)	Label
cellular_money_goods_robbery	<-->	Attempted_theft_of_cellular_assets	,947	,044	3,368	***	par_8
Vehicle_theft	<-->	Theft_of_money_cellular_goods	,889	,025	3,254	,001	par_9
Vehicle_theft_attempt	<-->	cellular_money_goods_theft	,920	,018	3,316	***	par_10
Threats_coercions	<-->	Theft_of_money_cellular_goods	,962	,026	3,396	***	par_11
scam_fraud	<-->	Mobile_money_theft_assets	,938	,024	3,351	***	par_12
Sexual_offences	<-->	Theft_of_money_cellular_assets	,920	,018	3,318	***	par_13
Vehicle_theft	<-->	Attempted_theft_of_cellular_goods	,945	,014	3,366	***	par_14
Vehicle_theft_attempt	<-->	Attempted_theft_of_cellular_goods	,921	,009	3,318	***	par_15
Threats_coercions	<-->	Attempted_theft_of_cellular_assets	,949	,014	3,373	***	par_16
scam_fraud	<-->	Attempted_theft_of_cellular_goods	,906	,013	3,289	,001	par_17
Sexual_offences	<-->	Attempted_theft_of_cellular_assets	,889	,009	3,254	,001	par_18
Vehicle_theft	<-->	Attempted_theft_vehicle	,900	,005	3,277	,001	par_19
Vehicle_theft	<-->	Threats_coercions	,915	,008	3,306	***	par_20
Vehicle_theft	<-->	Scam_fraud	,903	,007	3,282	,001	par_21
Vehicle_theft	<-->	Sexual_offences	,874	,005	3,224	,001	par_22
Vehicle_theft_attempt	<-->	Threats_coercions	,910	,005	3,296	***	par_23
Vehicle_theft_attempt	<-->	Scam_fraud	,918	,005	3,313	***	par_24
Vehicle_theft_attempt	<-->	Sexual_offences	,921	,004	3,319	***	par_25
Threats_coercions	<-->	Scam_fraud	,963	,008	3,398	***	par_26
Threats_coercions	<-->	Sexual_offences	,934	,006	3,344	***	par_27
scam_fraud	<-->	Sexual_offences	,929	,005	3,335	***	par_28

The analysis of correlations among different crime types reveals strong interconnections, particularly between theft-related offences such as stealing or attempting to steal money, property, or mobile phones. These offences appear highly coupled, suggesting that different forms of theft are not isolated behaviors but part of the same criminal dynamics. This reinforces prior research identifying theft as the predominant offence in urban contexts, driven by its low execution threshold, ease of opportunity, and high material gain [76, 77].

Beyond theft, other offences such as threats, coercion, and fraud emerge as central nodes that link multiple types of crimes. This pattern suggests that individuals engaging in these behaviors may be more likely to diversify into other offences, a phenomenon often associated with repeat offenders and organized crime networks [78, 79]. Although the associations with sexual offences are less pronounced, their consistent appearance alongside other crimes indicates that they often occur in environments of high criminal activity, pointing to unique but concentrated risk contexts.

These findings emphasize that crime in urban Peru should not be understood as isolated events but as clusters of interrelated behaviors. According to routine activity theory, this clustering arises from the convergence of motivated offenders, suitable targets, and insufficient surveillance [80, 81]. The strong connections between robberies and attempted robberies reflect the ease of committing these offences in settings where public oversight is weak. Similarly, the associations between fraud, coercion, and other crimes highlight the need to address low-level offences as potential gateways to more serious criminal conduct.

From a policy perspective, these results call for integrated prevention strategies that address the horizontal linkages between offences rather than treating them as separate phenomena. Community policing, situational prevention measures, and localized campaigns to reduce minor crimes could play a key role in disrupting these criminal networks and preventing escalation. Such approaches would not only mitigate direct victimization but also reduce the broader structural conditions that sustain clusters of criminal activity [82, 83]. They present the results of analyses on populations and the geographical location where victimization occurred in Peru. The structural model is focused on examining the total victims of crime in support to population categories (children, teens, adults and elderly) in urban areas such as Metropolitan Lima and Callao Constitutional Region.

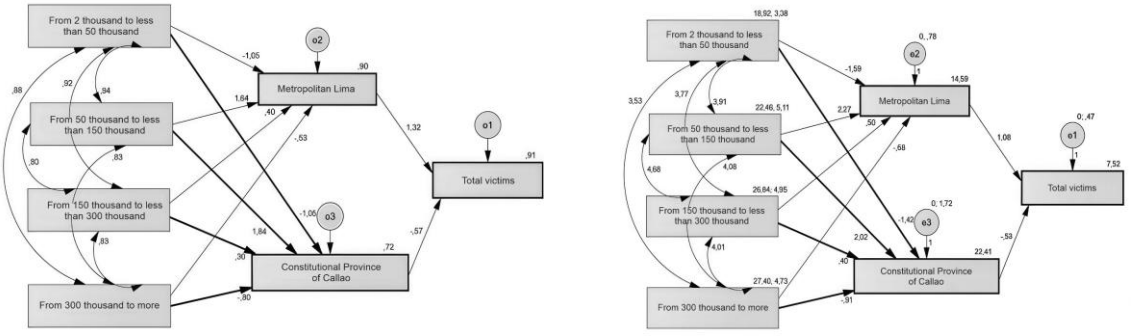

FIGURE 4. Model of the influence of population size and geographic location on total victimization in peru.

The results of the analysis showed that population size represented by the centers with 300,000 or more inhabitants had a positive and significant association with the total number of victims (coefficient = 1.32). The result strengthens evidence on the concentration of risks of populous urbanized areas because density may create not only more potential targets but the close proximity also stimulates opportunities by criminals and generates lower sense of community [84-86]. On the other hand, in the Constitutional Province of Callao there is a significant positive correlation between total victims and areas with less population density (such as population centers with 2,000 to fewer than 50,000 inhabitants) (coefficient of 1.86). This is likely to be as a result of the lesser presence of security forces and their proximity to port illicit activities among reasons that latest survey finds that these communities are more predisposed to specific crimes [87].

The observed results suggest that the incidence of crime in Peru reveals heterogeneous patterns according to urban contexts and population sizes. The high level of victimization in Metropolitan Lima and other concentrated urban areas is as expected under Routine Activities Theory, suggesting that more targets attract more crime whereas surveillance reduce it [88,89]. These results highlight the need for building up security policies in metropolitan regions more centered on the criminal control and common crime repression in highly populated territorial occupations.

The association of small populations with victimization was positive for Callao, which reveals the relevance of applying different security policies. Lower-density communities might require strategies such as better community policing and localized crime prevention programmes. Earlier literatures have generally proposed that crime might enhance especially in comparatively poorly knit communities where informal-help and supervision from communities is missing, thereby increasing the victimization bout area [90, 91].

Importantly, was derived using SEM. To assess the adequacy of the proposed model, standard fit indices were calculated: $\chi^2/df = 2.21$; Comparative Fit Index (CFI) = 0.957; Tucker–Lewis Index (TLI) = 0.948; Root Mean Square Error of Approximation (RMSEA) = 0.049; and Standardized Root Mean Square Residual (SRMR) = 0.046. These values satisfy widely accepted thresholds (CFI and TLI > 0.95; RMSEA < 0.06; SRMR < 0.08), indicating that the model provides a satisfactory fit to the observed data. The inclusion of these indices ensures transparency and methodological rigor, allowing readers to critically evaluate the robustness of the findings. Subsequently undertaking an analysis of various population center magnitudes in Peru concerning their affiliation with the incidence of victimization. In this paper, we use correlation analysis to understand how the size of a population center affects patterns of victimization and whether there is a significant relationship between those in different types of urban areas.

Table 6. Correlation between population center sizes in relation to victimization in Peru.

Size of Population Centre 1		Size of Population Centre 2	Estimation Coefficient (Estimate)	Standard Error (S.E.)	Critical Value (C.R.)	P-value (P)	Label
De_2mil_a_menos_50mil	<-->	De_50mil_a_menos_150mil	,941	1,165	3,357	***	par_6
De_2mil_a_menos_50mil	<-->	De_150mil_a_menos_300mil	,921	1,136	3,320	***	par_7
De_2mil_a_menos_50mil	<-->	From_300mil_or_more	,882	1,088	3,240	,001	par_8
De_150mil_a_menos_300mil	<-->	De_50mil_a_menos_150mil	,931	1,402	3,337	***	par_9
From_300mil_or_more	<-->	De_50mil_a_menos_150mil	,830	1,303	3,128	,002	par_10
De_150mil_a_menos_300mil	<-->	From_300mil_or_more	,829	1,283	3,126	,002	par_11

The findings confirm positive and significant correlations between different urbanization stages, indicating that the disparate population centers are related to crime victimization in a network. The best correlation is found between agglomerations with 2,000 inhabitants to less than 50,000 residents and 50,000 inhabitants up to less than 150,000 inhabitants (correlation factor =0.941; $p < 0.001$). This association suggests that the use of patterns in small towns may be linked to those in larger centers, which may reflect common causes such as geographical proximity and internal migration dynamics between urban and semi-urban regions [92].

Centers of 150 thousand to less than 300 thousand inhabitants have as well relevant correlations with other population sizes, such as centers of 300 thousand or more inhabitants (coefficient =0.829, $p = 0.002$) These findings suggest that over time and as a function of larger population size, victimization patterns in more populated areas may be influencing neighboring or like areas to an even greater extent, thus supporting the contention that the high density and concentrations of populations within large cities are creating spillover impacts on their peripheral population centers [93-95].

The results underscore the need to take into account the interdependence of population center size classes when crafting public security policies in Peru. Social Disorganization Theory (SDT) has been of particular interest in understanding why different types of formal and informal control systems may have mutually interacting effects on various forms of crime [96, 97], particularly under conditions to foster these motives when

mobility and population density are high. In that sense, besides the correlation between small and medium centers observed above, it seems important to implement prevention strategies not only in large urban centers but also considering the victims dynamics of semirural and rural populations.

Additionally, the analysis reveals that areas with 300,000 or more people can have a positive impact on surrounding regions as far as crime is concerned. One explanation for this could be related to the routine activities' theory, which states that with larger population there is more criminal opportunities from convergence of motivated offenders and suitable victims [98, 99]. Cloud migration and mobility are changing the pattern of migration, which, in turn will drive security policies to be more oriented to the types and sizes of population that are connected together.

Below are the results of these estimations for the hypotheses presented in this study according to various geographical areas and population sizes within Peru. Estimates (un- and standardized beta coefficients, p values) for each city or population range are shown in Table 7 for the 2 main hypotheses that were tested.

Table 7. Results of beta estimates for urban victimisation analysis in different Peruvian cities.

Hypotheses	Cities	Unstandardised beta estimates	Beta-standardised estimates	T	p	Results
H1	Lima_Metropolitan	1,081	1,481	8,808	0,000	Accepted
	Province_Constitutional_Callao	-0,526	-0,644	-3,833	0,001	Accepted
H2	De_2mil_a_menos_50mil	-0,424	-0,385	-2,572	0,018	Accepted
	De_50mil_a_menos_150mil	1,036	1,155	8,299	0,000	Accepted
	De_150mil_a_menos_300mil	0,272	0,298	2,445	0,024	Accepted
	From_300mil_or_more	-0,115	-0,123	-1,400	0,177	Not Accepted

Dependent variable: Number of offences

These findings allow hypothesis 1, which considers different effects across victimization in Metropolitan Lima and the Constitutional Province of Callao, can be accepted in both areas. For Metropolitan Lima, this is 1.481 (p 2K-49,999 inhabitants), which seems plausible (well-documented reports of reduced crime rates with the decrease in population density). In cities with populations between 50,000 and less than 150,000 there is a positive coefficient of 1.155 ($p < 0.001$) indicating that an association exists but only within the scope of victimization; meaning trends in population density and other social dynamics might increase crime opportunities [100,101]. It then rises again in towns of 150,000 to less than 300,000 (beta = 0.298, $p = 0.024$).

Finally, in areas of 300,000 inhabitants or more one cannot accept the hypothesis (beta = -0.123, $p = 0.177$), which can be explained by public safety issues that decrease or remove the perception of insecurity in large cities through surveillance and social control policies [102,103]. In this study, such evaluation was shown functional per a population size; however questionable per city sui generis, but still, it is valid to superordinate an integrated view of urban victimization patterns and prompt the development of regionally appealing public security strategies.

IV. CONCLUSION

The study allowed for a characterization of urban victimization in Peru, demonstrating that crime patterns vary according to population size, demographic characteristics, and territorial specificities. In Metropolitan Lima, a high incidence of crime was observed, associated with population density and lower community cohesion, while in the Constitutional Province of Callao, the results revealed the influence of economic and port-related dynamics linked to organized crime. It was also confirmed that young people between 15 and 29 years old concentrate the highest rates of victimization and show less willingness to report, which highlights

the need for preventive policies specifically targeted at this age group. Regarding crime typology, property-related offences particularly theft and robbery of personal belongings and mobile phones were the most decisive in shaping perceptions of insecurity, whereas sexual assaults and frauds displayed a notorious underreporting. These findings reinforce the assumptions of Social Disorganization Theory and Routine Activity Theory, underlining the importance of adopting differentiated strategies depending on the urban context.

One of the main limitations of this study lies in its cross-sectional design, which prevents capturing the temporal evolution of victimization patterns. Additionally, the use of self-reported data may introduce memory or perception biases that affect the accuracy of crime reporting. The absence of contextual variables such as social cohesion, community capital, or institutional presence also limited the depth of the analysis. Finally, the lack of specific information on highly underreported crimes, such as sexual offences, restricted a more comprehensive understanding of victimization.

In light of these limitations, it is recommended to develop longitudinal studies that allow the identification of victimization trends and the evaluation of the impact of security policies over time. It is also necessary to incorporate mixed-method approaches that combine statistical analyses with qualitative perspectives to explore perceptions, community practices, and cultural factors associated with reporting. Future research should further examine comparisons between large cities and intermediate urban centers, assessing the role of social cohesion and institutional resources in crime reduction. Likewise, it is suggested to explore preventive strategies targeting youth, as well as mechanisms to encourage reporting and make underreported crimes more visible.

Funding Statement

This research was supported by authors.

Author Contributions

All authors made an equal contribution to the development and planning of the study.

Conflicts of Interest

The authors have no potential conflicts of interest, or such divergences linked with this research study.

Data Availability Statement

Data are available from the authors upon request.

Acknowledgments

We would like to thank the Universidad Nacional de Moquegua and all the authors of the research project.

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