

# Public Safety And Crime In A District Of Metropolitan Lima, 2021

Juan Manuel Alayo Romero<sup>1\*</sup>, Luis Alberto Núñez Lira<sup>2</sup>, Doris Fúster Guillén<sup>3</sup>, Yolanda Felicita Soria Perez<sup>4</sup>, Jesús Enrique Núñez Untiveros<sup>5</sup>

<sup>1</sup>Universidad César Vallejo, Perú. Email: jalayo@ucvvirtual.edu.pe ORCID: <https://orcid.org/0000-0001-9422-0466>

<sup>2</sup>Universidad Nacional Mayor de San Marcos, Perú. Email: lnunezl@unmsm.edu.pe ORCID: <https://orcid.org/0000-0003-3542-9117>

<sup>3</sup>Universidad Nacional Mayor de San Marcos, Perú. Email: dfusterg@unmsm.edu.pe ORCID: <https://orcid.org/0000-0002-7889-2243>

<sup>4</sup>Universidad César Vallejo, Perú. Email: ysoria@ucv.edu.pe ORCID: <https://orcid.org/0000-0002-1171-4768>

<sup>5</sup>Universidad César Vallejo, Perú. Email: jesus.nunez@upn.edu.pe ORCID: <https://orcid.org/0000-0001-9069-4496>

\*Corresponding Author:- Juan Manuel Alayo Romero

<sup>1</sup>Universidad César Vallejo, Perú. Email: jalayo@ucvvirtual.edu.pe ORCID: <https://orcid.org/0000-0001-9422-0466>

Doi: 10.47750/pnr.2022.13.S05.13

## Abstract

The objective of the research was to establish the relationship between the management of community security and crime. For this, an investigation was carried out at a fundamental and correlational level; the quantitative approach was used, with a non-experimental design, with a transverse temporal scope; The study population was made up of all the residents of the district of San Martín de Porres (Lima), which has a total of 759,561 inhabitants. The sample was chosen by random sampling, the instruments were implemented mainly through the Google Form application. Since the responses were on an ordinal scale, Spearman's correlation statistic was used to perform statistical inference from the collected data. Through descriptive analysis, it was determined that high levels of crime are perceived to be associated with low levels of community safety management; Through inferential analysis, it was determined that there is an inverse correlation between community safety management and crime, which implies that the better the community safety management, the lower the crime rates.

**Keywords:** Criminality, social problem, human development, citizenship, civil rights

## INTRODUCTION

Globally, the crime rate by country as of 2021 points to Venezuela in first place with 83.76% as the most dangerous, followed by countries such as South Africa 76.86%, Afghanistan 76.31%, Honduras with 74.54%, among others; As for Peru, it appears in 12th place with an index of 66.72%, Chile in 41st place with 53.42%, the United States in 56th place with 47.81% and, at the bottom of the table, Qatar in 137th place with 12.13%. Regarding the security index, it is pointed out that Qatar is the country where greater security is perceived with 87.87%; on the other hand, Venezuela is the most insecure country with a security index of 16.24% (Numbeo, 2021).

At the same level, referring to intentional homicides, the World Bank indicates that, as of 2018, Venezuela had 37 homicides per 100,000 inhabitants; South Africa, 36; Peru, 8; United States, 5, among others; at the other extreme, the United Arab Emirates and Qatar with 0 homicides (World Bank, 2020); however, there are regions such as Guanajuato in Mexico with 73 homicides per 100,000 inhabitants, double that of Venezuela (México Social, 2021).

Likewise, in the global peace index that measures the level of peace and absence of violence in a country, Iceland appears in the first place with an index of 1,078, followed by New Zealand in second place with an index of 1,198; In this ranking, Venezuela is in 149th place with an index of 2,936, Peru in 84th place with an index of 2,066, among others (Datamacro, 2021). In the European Union, in 2018, 3,993 homicides were committed, a reduction of 30% in the last 10 years, Belgium and France lead the statistics of violent robberies with more than 150 robberies per 100,000 inhabitants, likewise, 583,000 assaults were reported and 528,000 cars were stolen (Eurostat, 2020).

In Peru, although it is true that investment in citizen security increased by more than 50%, the perception of insecurity persists, since this last indicator went from 35% in 2013 to 22% in 2020; a report by the Inter-American Development Bank (IDB) indicates that, if the use of public resources were more efficient, with those same resources crime could be reduced by 30%. According to the National Institute of Statistics, in its latest report on citizen security for 2020, 80% of people think that they may be the victim of some type of crime in the next 12 months, which is aggravated by the large amount of news that they repeatedly spread the media about crimes and crimes (Comex Peru, 2021). In the same sense, the investment in security and internal order for the month of October 2020 at the national level was on average S/. 390 per inhabitant; being Lima the most favored with S/ 663 per person and Callao the least favored with S/ 161 per inhabitant; As for private companies, they invest between 2% and 6% of their sales in security (Comex Perú, 2021). (S.V.N Sreenivasu, 2022, Mukesh Soni, 2022, Mehraj 2022, Abhishek Madduri 2021, Sharma D.K, 2023)

The district of San Martín de Porres -SMP-, which has a population of 759,561 inhabitants, has reported 5,877 events of violence against women during 2020, and the victimization rate is 32.7%, higher than the average of the country

that is in 22%, the firearm victimization rate stands at 15.20% for the district and the perception of insecurity reaches 93.7, likewise, 23,529 complaints of crimes committed were reported (Municipalidad de San Martín de Porres, 2021). Although it is true that the perception of crime and the same criminal events have decreased at the beginning of 2021, this has been mainly due to social distancing and the emergency measures taken by the Government on the occasion of SarCov2 (Madrid and Palomino, 2020 ); In this sense, it is crucial to develop an updated study that relates the management of citizen security and the perception of crime in their jurisdictions. In this context, the general problem is formulated: is there a relationship between citizen security management and crime in SMP, 2021?

The present investigation is justified, theoretically, by explaining the relationship between the management of citizen security in charge of the municipal authority and the perception of the neighbors about crime, opening the possibility of reflecting on the causes and effects that the crime provokes. presence in the neighborhood. Regarding the methodological justification, the method that is being used, as well as the instruments, will be useful for other institutions to replicate them in their jurisdictions. In practice, the research allows a current vision of the characteristics and behavior of both the management of citizen security and crime for purposes not only of analysis and knowledge, but also for decision-making purposes in the improvement of its indicators. . The general objective is formulated as: determine the level of relationship between the management of citizen security and crime in SMP, 2021.

In reference to previous works, Bolaños (2020) set himself the objective of improving the citizen security service in Majes, province of Caylloma (Arequipa); For this purpose, it develops an applied research, with a quantitative approach, whose hypothesis is the reduction of crime rates. The author concludes that the perception of citizen insecurity is reduced from 79.2% to 55.2%, with three complementary citizen security procedures to those already in existence: a larger budget for the execution of the citizen security plan, creating a training center for training of watchmen with capacity for 200 students and that there be two promotions a year. The present investigation showed that citizen security has an inverse relationship with crime, since the higher the investment, the lower the perception of insecurity.

For his part, Vílchez (2019) set himself the objective of establishing the relationship between ICTs and the fulfillment of citizen security goals; for this purpose, it develops a quantitative approach research in the city of Puno. The researcher concludes that, although it is true that the descriptive results indicate that 73% of the population does not agree with the use of information technologies for the fulfillment of citizen security goals regarding the prevention of criminal activity , In the inferential analysis, the correlation between ICT and the goals of citizen security regarding the prevention of criminal activity was demonstrated ( $r= 0.533$ ). The present investigation demonstrated the relationship that exists between the different strategies that can be used in the management of citizen security and the fulfillment of crime prevention goals.

Burga (2018) set out to demonstrate the impact of citizen security on crime; for this purpose, it develops an investigation, in the city of Trujillo, of an explanatory type and quantitative approach; In the inferential analysis, it is shown that there is a relationship between citizen security and criminality; Likewise, it is observed that 95% consider that crime and insecurity are affected by progress and development, which has to do with investments. The present investigation verified the relationship that exists between the variables.

As for Sánchez (2017), the researcher considered generating an integrated crime and citizen security statistics system as an instrument to fight crime and citizen security. The author develops a quantitative approach research, concluding that, if society is well informed through the precise identification of the determinants of crime that allow an accurate knowledge of its characteristics and frequency, it will make good use of the information to protect itself, avoiding confrontation with risks. The author's results prove that the strategies to lead citizen security are diverse, and they always have the expected results; that is, reduce crime rates.

Rodríguez (2019) established the influence of the crime of aggravated robbery on citizen security; For this purpose, the author elaborates, in the district of Los Olivos (Lima), an explanatory type research with a quantitative approach, where the sample consisted of 68 people, to whom a survey was applied; The researcher concludes that there is a relationship between the crime of aggravated robbery and citizen insecurity, confirming that, if citizen security policies were applied, crime would decrease. This study provided support for the existence of an inverse relationship between citizen security and crime.

Similarly, Vásquez (2017) established the influence of citizen security on crime prevention strategies; To this end, he develops his research in the neighborhood of San Juan, one of the most dangerous areas of Quito, in Ecuador. Among the results, it is pointed out that the perception of victimization from 2004 to 2008 decreased from 22.9% to 18.3%, then it increased to 23.35% in 2011; the level of thefts remained almost constant, passing from 367 to 369 in the evaluated period; in order to improve security, 48.3% of the population indicates that coordination with the police should be done; 30.1% would set alarms; 15.3% would carry out neighborhood watch rounds; 4% would hire private security. The researcher also concludes that, although it is true that there has been a decrease in crime indicators as a result of security actions, the perception of insecurity is still latent.

Van Steden (2017) analyzed the effects of citizen security management on crime; To this end, he conducts his study in Cardiff (England), where a fairly orthodox method has been developed to improve citizen security, especially at night: a group of 80 Christian pastors have gone out to voluntarily patrol the streets of the city in order to preserve the tranquility of its inhabitants and, although there is no empirical evidence that its strategy has worked, that is, crime statistics that show a decrease, there is a perception of greater tranquility in the streets of Cardiff. The present work showed that the strategies to manage citizen security are varied and of all kinds, and the results will be the same: greater tranquility in the population.

For their part, Cui et al. (2018) analyzed the context of smart cities from the perspective of security and privacy; point out that cities are expected to promote a better quality of life for their citizens; however, security and privacy issues

have become a major challenge that requires designing mechanisms and systems as effective measures against insecurity. The authors conclude that multiple intelligent security applications and methods can be applied as a strategy to combat citizen insecurity; however, in the same sense, while new methods and technologies are being developed to combat insecurity, the needs of the population regarding the same issue are also increasing. This research shows that any effort made to increase the safety of the population will be well accepted, since the perception of safety will increase.

In order to conceptualize citizen security, a subject of study, Muggarh (2017) is taken as a reference, who refers that citizen security is all those activities that are developed in a community to achieve the prevention and reduction of crime, the violence, establish public security and the right to justice, strengthen social ties and support the rights and responsibilities between the State and citizens. Quintero (2020) defines citizen security as a strategy undertaken by governments in order to strengthen the State, entrusting its institutions with the security of the city; For this reason, they develop a series of integrated activities with a single objective: the prevention of violence and crime. In the same sense, for Vásquez (2017), it is an articulating concept of policies and strategies that seek to align security from a comprehensive approach through prevention and persuasion.

In turn, Muggah and Aguirre (2018) pointed out that citizen security is a concept usually regulated and used in the policies of Latin America and the Caribbean; but little theorized. Citizen security forces the State to be responsible with the population.

Law No. 27933, Law of the National Citizen Security System (2003) defines, in its article 2, citizen security as the integrated action developed by the State with the collaboration of citizens; in this way, guarantee coexistence, eradication of violence and the peaceful use of public spaces; as well as the prevention of the commission of crimes.

Pérez and Nuñovero (2020) highlighted that the ideal of citizen security is stable and pleasant coexistence between various cultural, social and political groups with tolerance and peaceful relations; They point out that the main objectives of the Citizen Security System (Sinasec) are the following: ensure compliance with public policies on Citizen Security; promote the articulation of State programs to address the country's territories to violence and crime; motivate the community to support the multisectoral effort to improve local security; coordinate activities to ensure the standardization and interoperability of ICTs at the national level for security; prioritize and develop multisectoral policies to prevent crime.

Law 27933, in its articles 4 and 6, indicates the components of Sinasec such as the National Council for Citizen Security (Conasec), the Regional Committee for Citizen Security (Coresec), the Provincial Committee for Citizen Security (Coprosec) and the District Committee of Citizen Security ( Codisecc ), which, according to their competence, present their action plans proposed by each Technical Secretariat to the National, Regional, Provincial and Municipal Governments, respectively. To date, in Legislative Decree 1454, the Ministry of the Interior was assigned the stewardship of Sinasec, assuming its functions.

Regarding criminality, Andrade (2020) referred that crime is that conduct that, due to excess of power, is carried out against the fundamental rights and customs of people; likewise, it recognizes individual crime and collective crime, the latter being able to also be organized crime. For Rodríguez et al. (2018), the social contexts show that, in countries where crime rates are low, fear tends to affect the well-being of citizens less; on the other hand, in countries where crime rates are high, there may be a more acute perception of danger.

The National Institute of Statistics and Informatics -INEI- (2018), in its Statistical Yearbook of Crime and Citizen Security, mentions that the crimes typified against citizen security are against property, against public security, against life, the body and health, against liberty and against public tranquility.

Likewise, Dudley and Rodríguez (2013) indicated that one of the reasons for crime is, precisely, the existence of legal businesses and, in order to adopt security for their premises and their homes, they adopt the concept of smart homes, providing the ability to maintain 24-hour surveillance of their premises and homes. Kesavan et al. (2016), Escobar and Salinas (2016) and Al-Ali et al. (2017) coincided in pointing out that, in smart homes, the smart city emerges, through information technologies, interconnection, material security, basic social conditions, physical health, functional condition, among others (Peñaška et al., 2020).

## METHOD

The present work was basic, because it sought to understand and contribute to existing theories updated and contextualized concepts to a reality of the variables citizen security and crime, the purpose is a better understanding of the variables and that the findings serve as theoretical bases for new research; Arias (2020) points out that basic investigations are those that provide theoretical bases for new investigations.

It was of a correlational level, since it seeks to establish the correlation between citizen security and crime in a given context; for Cabezas et al. (2018) and Seeram (2019), correlational research seeks to establish the relationship between two variables.

Regarding the research approach, it was quantitative, the data on both citizen security and crime were collected through surveys on an ordinal scale, the results of which were treated statistically and subjected to an inferential analysis using statistical software in order to test the hypothesis that between both variables there is statistical correlation; Apuke (2017), Bryman (2017), and Cabezas et al. (2018) refer that quantitative studies are those that collect data to test hypotheses, based on a numerical measurement and statistical analysis.

Its design was non-experimental, since the research on citizen security and criminality was carried out in the reality of each one, in its own environment in which there is no intervention, it is only measured as they are, without altering or modifying them; for Hernandez et al. (2014) and Leatherdale (2019), non-experimental studies are those that

are carried out without altering the variable as it occurs in reality. Its scope was transversal, since both citizen security and criminality will be measured only once during the investigation; cross-sectional studies are those that are measured at one time ( Valderrama and Jaimés , 2019; and Zangirolami et al., 2018 ) .

Arias (2020) indicated that the operationalization of the variable is the process that allows the variable to go from the general to the specific; it is the decomposition of the variable in dimensions and indicators with the purpose of a better understanding and measurement.

Citizen security, whose conceptual definition is the articulation of policies and strategies that align security from persuasion and prevention (Vásquez, 2017). As indicated, there are three dimensions of citizen security: operation, which includes the planning, organization and control of its activities; the articulation, which it develops with the Government, the National Police and the Neighborhood Councils; and, the results, which are achieved through peaceful coexistence, the eradication of violence and the use of public spaces.

Criminality is defined as the phenomenon that measures the behaviors that, due to excess power, are carried out against the fundamental rights and customs of people (Andrade, 2020). As indicated, there are five dimensions of criminality: crimes against property, which refer to all those crimes typified as theft, robbery, cattle rustling, illegal appropriation, reception, fraud, fraud, extortion, usurpation, damage, crimes IT, common provision (Title V, Legislative Decree 635); crimes against public security, which refer to crimes committed and typified as common danger, against means of transportation, communication, and other public services, against public health and the migratory order (Title XII, Legislative Decree 635 ); crimes against life, body and health, which refer to the commission of the crimes of homicide, abortion, injuries and the exposure of people to danger (Title I, Legislative Decree 635); crimes against freedom, which refer to the commission of crimes against personal freedom, violation of privacy, violation of domicile, violation of the secrecy of communications, violation of professional secrecy, against freedom of assembly, against freedom of work, against freedom of expression, against sexual freedom, pimping and public modesty (Title IV, Legislative Decree 635); crimes against public tranquility, which refer to the commission of crimes typified as against public peace and terrorism ( Title XIV. D. Leg - 635).

For Etikan and Babtope (2019) and Valderrama (2014), the population is the set of subjects or objects of study that must share a common characteristic; In the present study, the population is finite or known and was made up of all the inhabitants or neighbors of the San Martín de Porres district, which, in quantity, are 759,561 inhabitants. Likewise, Arias (2020) refers that the inclusion and exclusion criteria are those characteristics of the population that are related to the achievement of the population's objectives. As inclusion criteria, all neighbors who have reached 15 years of age or older, residents of the area, without distinction of gender or other type and who, in quantity, are 618,738 inhabitants were considered; Regarding the exclusion criteria, all the inhabitants who are under 15 years of age and who, in quantity, are 140,823, were considered. As for the sample, this is a representative subset of the population ( Quezada, 2010)

From the calculation made, it follows that the number of residents of San Martín de Porres to whom the survey should be applied is 379 people. Regarding sampling, this turns out to be the technique by which the sample of the study population is extracted or chosen, and this sampling can be probabilistic and non-probabilistic ( Quezada, 2010); For the present study, the sampling to extract the 379 of the 618,738 inhabitants was simple random probabilistic; that is, all the inhabitants had the same opportunity to participate in the study.

Regarding the unit of analysis , these were the residents, residents of the district of San Martín de Porres; Arias (2020) indicates that the unit of analysis is that object of study from which the information for the analysis of the study is produced.

The techniques for data collection are the procedures that allow collecting information and measuring the study variables, Valderrama (2014); In the present case, the technique used was the survey. Following Valderrama (2014), the instrument is the resource or means used by the researcher in order to collect the information that allows the variable to be measured; In order to collect information to measure citizen security and crime, the questionnaire was used. For Hernández et al. (2014), a validated instrument is one that has the ability to really measure the variable of interest according to the judgment of experts on the subject; The instruments of this research work have been validated by expert methodologists with a doctorate degree .

On the reliability of the measurement instruments, Hernández et al. (2014) indicate that it is the ability of an instrument to produce consistent and coherent results; in the present work, and given that the answers are on an ordinal scale, it is appropriate that it be determined through the Cronbach, Chan and Idris (2017) Alpha statistician ; the reliability levels being the following: .878, for instrument 1 and .839 for instrument 2.

In order to carry out the analysis of the data, these were first worked descriptively, determining the distribution of frequencies, whose results were presented in statistical tables and graphs. In order to contrast the research hypotheses, which seek to confirm the relationship between the variables and these being measured on an ordinal scale, an inferential analysis was carried out using the Spearman test, because it is a statistician that measures the correlation between ordinal categorical variables.

During the conduct of this research, national and international ethical standards have been followed with autonomy and respecting the people who participated in the sample, to whom the objectives pursued and the benefits of a responsible and real response were explained; Likewise, during the application of the measurement instruments, good customs have been respected, without interfering or influencing their opinions, or the results obtained from them, always from the perspective of the search for truth and justice. . On the other hand, the analysis of the information collected has been worked objectively without allowing any bias, without interfering in the process, since these were worked automatically through the statistical software. Likewise, in the preparation of the document, the intellectual authorship of

the authors of whom reference has been made to support the investigation has been respected, which is evidenced by the result of the similarity analysis using the Turnitin software .

## RESULTS AND DISCUSSION

Table 1 shows the frequencies of people's perception of citizen security management and its dimensions; Regarding this variable, the majority of people (91.8%) do not consider that good management is being carried out and, although it is true that 77.6% consider it as regular, this implies that there are still issues to improve; This perspective is reaffirmed when functionality is appreciated, where 56.6% of those surveyed openly state that it is bad; that is, it does not meet the objectives for which it was implemented; on the other hand, in terms of articulation, a majority of those surveyed (38.7%) perceive that there is good articulation or that the necessary efforts are made for the system to work; but these are not reflected in the results, since 21.3% perceive that the results are bad and if we consider the regular results, 89.4% consider that the results of the system are not good, which says that there is much to improve.

**Table 1** Frequency of citizen security management and its dimensions

	Citizen Security Management	functionality	Joint	Result
Bad	13.2%	56.6%	10.8%	21.3%
Regular	77.6%	38.2%	50.5%	67.1%
Okay	9.2%	5.3%	38.7%	11.6%
Total	100.0%	100.0%	100.0%	100.0%

From table 2, it can be seen that there are high levels of crime, the perception of the population indicates high levels of its presence, 49.7% confirms this; Among its dimensions, it can be seen that the perception of those surveyed about the presence of crimes in their environment is high, 66.8% consider that at any time they can be victims or witnesses of violent events caused by gangs or groups of socially maladjusted elements; 66.1% indicate that they have been or may be witnesses to the sale of drugs; 62.6% consider that they may be victims of robbery or robbery; on the other hand, 50% state that they may be victims or witnesses of crimes or violent acts that threaten people's lives; and 32.4% consider that they can threaten their freedom; As can be seen, it is perceived that crime levels are high in SMP, there is fear that at any time people may be victims or witnesses of some type of crime. There is only 5% who perceive crime levels as low, which does not imply that it does not exist.

**Table 2** Frequency of crime and its dimensions

	Criminality	Crimes against property	Crimes against public safety	Crimes against life, body and health	crimes against freedom	Crimes against public tranquility
Short	5.0%	5.5%	7.6%	10.8%	26.1%	5.8%
Regular	45.3%	31.8%	26.3%	39.2%	41.6%	27.4%
high	49.7%	62.6%	66.1%	50.0%	32.4%	66.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The purpose of the research is to establish relationships between the variables and their dimensions and that the data come from responses on an ordinal scale, the inferential analysis must be carried out with a relational statistical model, the statistician used being Spearman, which measures the associativity between the variables when these come from an ordinal scale (Hernández and Mendoza, 2018; Akoglu , 2018 and Schober et al., 2018).

From table 3, with a reliability of 95%, it is established that the value of  $\alpha$  is 0.000, so according to the decision rule  $H_0$  is rejected and it is confirmed that there is a relationship between citizen security management and crime in SMP, 2021 ; Likewise, it can be seen that the value of Spearman's Rho is  $-.296$ , which according to the table of values in Annex 7, is considered as a low negative correlation; verifies that, as citizen security management improves in the SMP district, crime levels will decrease.

**Table 3** Correlation analysis between citizen security management and crime

		Citizen Security Management	Criminality
<b>Spearman's rho</b>	Citizen security management	Correlation coefficient	1,000
		Next (2-sided)	<b>0.000</b>
	Criminality	Correlation coefficient	$-.296^{**}$
		Next (2-sided)	0.000
		N	380
		N	380

\*\*The correlation is significant at the 0.01 level (two-sided).

From table 4, it is confirmed that there is a relationship between the management of citizen security and crimes against property in SMP, 2021 ; likewise, it can be seen that the Spearman's Rho value is  $-.320$ , which is considered as a low negative correlation; verifies that, as citizen security management improves in the SMP district, crime levels regarding crimes against property will decrease. Likewise, it is confirmed that there is a relationship between the management of citizen security and crimes against public security in SMP, 2021 ; where the Spearman's Rho value is -

.347, it is considered as a low negative correlation; which proves that as citizen security management improves in the SMP district, crime levels regarding crimes against public security will decrease. In addition, it is confirmed that there is a relationship between the management of citizen security and crimes against life, body and health in SMP, 2021 ; where the value of Spearman's Rho is  $-.213$ , it is considered as a low negative correlation; which proves that as citizen security management improves in the SMP district, crime levels regarding crimes against life, body and health will decrease. It is also confirmed that there is a relationship between the management of citizen security and crimes against freedom in SMP, 2021 ; and that the Spearman's Rho value is  $-.142$ , it is considered as a very low negative correlation; which proves that as citizen security management improves in the SMP district, crime levels regarding crimes against freedom will decrease. Finally, it is confirmed that there is a relationship between the management of citizen security and crimes against public tranquility in SMP, 2021 ; considering as a low negative correlation; which proves to us that as citizen security management improves in the SMP district, crime levels regarding crimes against public tranquility will decrease.

**Table 4** Correlation analysis between citizen security management and dimensions of the crime variable (dimensions)

Specific hypothesis	variables	Spearman's rho	Bilateral significance	n
HE1	Citizen security * commission of crimes against property	$-.320^{**}$	0.000	380
HE2	Citizen security * commission of crimes against public security	$-.347^{**}$	0.000	380
HE3	Citizen security * commission of crimes against life, body and health	$-.213^{**}$	0.000	380
HE4	Citizen security * commission of crimes against freedom	$-.142^{**}$	0.006	380
HE5	Citizen security * the commission of crimes against public tranquility	$-.305^{**}$	0.000	380

\*\* . The correlation is significant at the 0.01 level (bilateral).

## DISCUSSION

The present investigation is relevant in the current circumstances where the public information media refer to overflowing crime, where every day the front pages of the main newspapers and the audiovisual communication media have their complete summaries on hired assassins, assaults, robberies, etc.; Therefore, through the results of this work, it is expected to understand the behavior of criminality and the weak points of the citizen security management system with a view to proposing actions aimed at improving their strategies and actions.

Regarding the relationship between the citizen security management system and crime, it is evident that the inhabitants of the district of San Martín de Porres have a majority perception (90.8%) that the system does not work well, from regulating down, only 9.2 % have a good perception of the system and, in terms of crime, it can be seen from the descriptive analysis that the majority (95%) consider that their presence is from regular to high, only 5% consider that crime is low; Likewise, from the analysis carried out with Spearman at a reliability of 95%, it has been established that there is a low negative correlation ( $-0.296$ ) between the two variables, which means that as the positive perception of citizen security management increases, the perception of the crime must decrease or vice versa. It is evident from the results that the objective of citizen security management is to reduce crime levels, the more resources are invested in citizen security, the crime levels will be reduced, although it is evident that the problem of crime is broader, not only depends on good management, the problem is comprehensive, as there are factors that determine it, such as lack of opportunities, lack of employment, dysfunctional families, social disorganization, among others, and these issues are no longer part of the management of citizen security, but rather they are in the field of public policies in favor of society and especially in the less favored.

Among the antecedents that coincide with the findings, Rodríguez et al. (2018) who found that, in the Colombian environment, there is a correlation between citizen security and crime; Bolaños (2020) shows that greater investment in citizen security management decreases crime in Majes, Arequipa, which implies a negative correlation; Vásquez (2017) finds that the crime rate decreased as a result of a series of actions to improve citizen security in Ecuador, which demonstrates the negative relationship between citizen security management systems and crime; Cui et al. (2018) conclude that the use of multiple applications and intelligent methods of managing security help reduce the perception of crime; In the same sense, for Vélchez (2019), the correlation between the use of strategies in citizen security management with information technologies and the prevention of criminal activity; Likewise, Burga (2018) shows that there is a relationship between citizen security and crime in the city of Trujillo (Peru) and Sánchez (2017) confirms that the strategies to lead citizen security are diverse and they always reduce crime rates.

On the other hand, of the theories that support the results, there is Muggath (2017), who refers that citizen security aims to prevent and reduce crime; Along the same lines, Muggath and Szabo (2014) point out that citizen security management systems are typical of responsible states that guarantee the rights of citizens and at the same time reduce crime levels. Both authors reaffirm the results of the investigation, given that the objectives of citizen security are to prevent, reduce crime, guarantee the rights of citizens; that is to say, the management of citizen security and criminality have an inverse relationship; If crime levels are to be reduced, citizen security management must be improved.

Taking into account the relationship between the citizen security management system and crimes against property, it is evident that the inhabitants of San Martín de Porres have a majority perception of regular for discharge

(94.5%) of the presence of this type of crime in the district, only 5.5% have a low perception; Likewise, from the analysis carried out with Spearman at a reliability of 95%, it has been established that there is a low negative correlation (- 0.320), between the citizen security management system and crimes against property, which means that as the perception of positive aspect of citizen security management, the perception of crimes against property decreases.

It should be borne in mind that this result is the third crime that is most widely perceived among the residents of SMP and, due to its characteristics, it affects people's property, so the residents invest in their safety through security cameras in their homes, houses, bars in their houses and on their blocks, private guards, guard dogs, so the perception is that, with greater investment in security, the rates of crimes against property are reduced.

Among the previous works or antecedents that coincide with the result found, Rodríguez (2019) is mentioned, who confirms that there is an inverse relationship between the crime of theft (patrimony) and citizen security management in Los Olivos.

Regarding the theories that support the result, the INEI (2018) reinforces the idea that crime against property is one of the highest incidence, reporting 23,783 events in 2018, almost 44.6% of total crimes .

Taking into account the relationship between the citizen security management system and crimes against public security, it is evident that the inhabitants of San Martín de Porres have a majority perception of regular for high (98.4%); of the presence of this type of crime in the district, only 7.6% have a low perception; Likewise, from the analysis carried out with Spearman at a reliability of 95%, it has been established that there is a low negative correlation (- 0.347), between the citizen security management system and crimes against public security, which means that as the positive perception of citizen security management the perception of crimes against public security decreases.

It should be noted that, in 2018, the INEI reported this type of crime as the one with the second largest presence in the city, since due to their characteristics they tend to generate fear, since they are crimes such as illegal possession of weapons, driving in drunk or recklessly, ganging, among others.

Among the antecedents that coincide with the result, Van Steden (2017) is mentioned, who, in his research carried out in England, showed that the perception of public safety improved through the night neighborhood patrol strategy, evidencing an inverse relationship between citizen security management and crimes against public security.

Theories that agree with the result are mentioned Muggarh (2017) who refers that the strategies used to manage citizen security reduce crime and establish public security; Likewise, Law 27933, in 2003, contemplates that the management of citizen security seeks to guarantee coexistence, eradication of violence and the peaceful use of public spaces; as well as the prevention of the commission of crimes; Muggah and Aguirre (2018) point out that citizen security management includes a series of practices that aim to prevent and reduce violence, promoting public security; likewise, Rodríguez et al. (2018) point out that, in places where there are high crime rates, the perception of danger is greater; that is, the greater the crime, the greater the sensation of danger and, according to the results found, efforts should be made to improve citizen security in order to reduce the insecurity rates.

It should be borne in mind that , for the INE (2018), this type of crime represented 18.9% of the total reported and, due to its characteristics, it is the one that most affects the integrity and health of people, since it has to do with with injuries and homicides.

Bearing in mind the relationship between the citizen security management system and crimes against life, body and health, it is evident that the inhabitants of San Martín de Porres have a majority perception of regular for discharge (89.2%) of the presence of this type of crime in the district, only 10.8% have a low perception; Likewise, from the analysis carried out with Spearman of a reliability of 95%, it has been established that there is a low negative correlation (- 0.213) between the citizen security management system and crimes against life, body and health, which means that as the positive perception of citizen security management increases, the perception of crimes against life, body and health decreases.

The theories that support the result mention Quintero (2020) indicating that citizen security aims to strengthen the presence of the State in the prevention of violence and crime; Pérez and Nuño (2020) who point out that, among the objectives of citizen security, is prioritizing and developing multisectoral policies to prevent crime.

Taking into account the relationship between the citizen security management system and crimes against freedom, it is evident that the inhabitants of San Martín de Porres have a majority perception of regular for high (73.9%); of the presence of this type of crime in the district, only 26.1% have a low perception; Likewise, from the analysis carried out with Spearman at a reliability of 95%, it has been established that there is a very low negative correlation (- 0.142), between the citizen security management system and crimes against freedom, which means that as the positive perception of citizen security management the perception of crimes against freedom decreases.

Among the theories that support the result, Law 27933 (2003) is mentioned, which contemplates that the management of citizen security seeks to guarantee the prevention of the commission of crimes; Taking into account the relationship between the citizen security management system and crimes against public tranquility, it is evident that the inhabitants of San Martín de Porres have a majority perception of regular for high (94.2%); of the presence of this type of crime in the district, only 5.8% have a low perception; Likewise, from the analysis carried out with Spearman at a reliability of 95%, it has been established that there is a low negative correlation (- 0.305), between the citizen security management system and crimes against public tranquility, which means that as the positive perception of citizen security management the perception of crimes against public tranquility decreases. Rawal et. al ( 2021), Poongodi M et. al( 2022), Poongodi M et. al (2021), Dhiman P et.al (2022), Sahoo SK et.al (2022 ), KA et. al( 2022), Dhanraj RK et. al (2020), Yan Zhang et.al (2020), Md Hossain et . al (2021), Md Nazirul Islam Sarker et. al (2021 ), Y. Shi et. al (2020), Guobin Chen et. al (2020), Poongodi M et. al (2019), Poongodi M et. to (2020)

Among the antecedents that coincide with the results found, Suárez et al. (2019) who demonstrate that the strategy of installing surveillance cameras improves the response time to criminal events, evidencing the negative

relationship between citizen security management and crimes that alter security and public tranquility in the Colombian country.

Among the theories that coincide with the result, Pérez and Nuño (2020) are mentioned, who highlight the stable and pleasant coexistence between various social and political cultural groups, as a consequence of citizen security; Rodríguez et al. (2018) report that in countries where crime rates are low, fear tends to affect the well-being of citizens less, and in countries where crime rates are high, there may be a more acute perception of danger.

## CONCLUSIONS

Regarding the general research objective, the relationship between citizen security management and criminality was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.000 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.296, which is defined as a low negative correlation. Likewise, from the descriptive analysis, 90.8% of those surveyed perceive that the citizen security management system is fair to poor; and in terms of crime, 95% of those surveyed consider it to be regular to high. This reaffirms its inverse relationship, and if you want to lower crime rates, you have to carry out better management of citizen security.

Regarding the first specific objective, the relationship between citizen security management and crimes against property was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.000 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.320, which is defined as a low negative correlation. Likewise, from the descriptive analysis, it is found that 94.5% of the respondents perceive that crimes against property have a presence of regular to high.

Regarding the second specific objective, the relationship between citizen security management and crimes against public security was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.000 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.347, which is defined as a low negative correlation. Likewise, from the descriptive analysis, it is found that 96.4% of the respondents perceive that crimes against public security have a presence of regular to high.

Regarding the third specific objective, the relationship between citizen security management and crimes against life, body and health was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.000 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.213, which is defined as a low negative correlation. Likewise, from the descriptive analysis, it is found that 89.2% of the respondents perceive that crimes against life, the body and health have a presence of regular to high.

Regarding the fourth specific objective, the relationship between citizen security management and crimes against freedom was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.006 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.142, which is defined as a low negative correlation. Likewise, from the descriptive analysis, it is found that 74% of the respondents perceive that crimes against freedom have a presence of regular to high.

Regarding the fifth specific objective, the relationship between citizen security management and crimes against public tranquility was established, as determined by the Spearman test at a reliability of 95%, where the significance was 0.000 ( $\alpha < 0.05$ ); likewise, the Rho coefficient resulted in -0.305, which is defined as a low negative correlation. Likewise, from the descriptive analysis, it is found that 94.2% of the respondents perceive that crimes against public tranquility have a presence of regular to high.

## REFERENCES

1. Akoglu, H. (2018). User's guide to correlation coefficients. Turkish journal of emergency medicine, 18(3), 91-93. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6107969/>
2. Al-Ali, Z., Rashid, G. & Alikarar, C. (2017). A smart home energy management system using IoT and big data analytics approach, IEEE Trans. *Consume \_ Electron.*, vol. 63, no. 4, p. 426-434.
- a. <https://www.semanticscholar.org/paper/A-smart-home-energy-management-system-using-IoT-and-Al-Ali-Zuolkernan/a607e0c6a0d5d1321eca383939dbcb2b638613a2>
3. Andrade, X. (2020). *General Guide on Corruption and Organized Crime*. Ed. Program the pact. Madrid. ISBN. 978-84-09-12666-8.
- a. <https://www.elpacto.eu/wp-content/uploads/2019/07/Guia-general-sobre-corrupcion-y-delincuencia-organizada.pdf>
4. Apuke, O. (2017). Quantitative research methods: A synopsis approach. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 33(5471), 1-8.
- a. [https://www.researchgate.net/publication/320346875\\_Quantitative\\_Research\\_Methods\\_A\\_Synopsis\\_Approach](https://www.researchgate.net/publication/320346875_Quantitative_Research_Methods_A_Synopsis_Approach)
5. Arias, J. (2020). *Thesis project: Guide for the elaboration*. Publisher Arias, Arequipa, Peru. ISBN: 978-612-00-5416-1
6. World Bank, (2020). *Intentional homicides (per 100,000 inhabitants)*. <https://data.bankworld.org/indicator/VC.IHR.PRC.P5?end=2018&start=2018&view=bar>
7. Bolaños, R. (2020). Improvement of the citizen security service in the Majes district of the Arequipa region with complementary procedures to the existing norms [Master's Thesis in Public Management, Continental University]. [https://repositorio.continental.edu.pe/bitstream/20,500.12394/7909/1/IV\\_PG\\_MGP\\_TI\\_Bola%20c%20s\\_Tacuri\\_2020.pdf](https://repositorio.continental.edu.pe/bitstream/20,500.12394/7909/1/IV_PG_MGP_TI_Bola%20c%20s_Tacuri_2020.pdf)
8. Bryman, A. (2017). Quantitative and qualitative research: further reflections on their integration. In *Mixing methods: Qualitative and quantitative research* (pp. 57-78). Routledge.
- a. <https://www.taylorfrancis.com/chapters/edit/10.4324/9781315248813-3/quantitative-qualitative-research-reflections-integration-alan-bryman>
9. Burga, O. (2018). *Citizen security and its impact on crime in the city of Trujillo, 2017* [Master's Thesis, National University of Trujillo]. <https://dspace.untruu.edu.pe/bitstream/handle/UNITRU/11589/Burga%20Benguer%20Omar%20Antonio.pdf?sequence=1&isAllowed=y>
10. Heads, E.; Andrade, D. and Torres, J. (2018). *Introduction to the Methodology of Scientific Research*. University of the Armed Forces. WAIT. Ecuador. ISSN. 978-9942-765-44-4.
11. Comex Peru, (2021). *Public spending for citizen security grew by more than 50%, but the perception of insecurity remains high. Weekly 1050*. <https://www.comexperu.org.pe/articulo/el-expenditure-public-for-security-citizen-grew-more-than-50-but-the-perception-of-insecurity-se-maintains-high>

12. Cui, L., Xie, G., Qu, Y., Gao, L., & Yang, Y. (2018). Security and Privacy in Smart Cities: Challenges and Opportunities. *Lee Access*. See 6. DOI: 10.1109/ACCESS.2018.2853985. <https://dro.deakin.edu.au/eserv/DU:30114656/cui-securityandprivacy-2018.pdf>
13. Escobar, L. y Salinas, S. (2016). *E-Health prototype system for cardiac telemonitoring*, in Proc. Annu. Int. Conf. IEEE Eng. Med. Biol. Soc. EMBS, vol. 2016-October, pp. 4399–4402, 2016.
14. Chan, L. e Idris, N. (2017). Validity and reliability of the instrument using exploratory factor analysis and Cronbach's Alpha. *International Journal of Academic Research in Business and Social Sciences*, 7(10), 400-410. <https://ideas.repec.org/a/hur/ijarbs/v7y2017i10p400-410.html>
15. Dudley, S. and Rodriguez, S. (2013). *Civil Society, the Government and the Development of Citizen Security*. Washington, DC & San Diego: Woodrow Wilson International Center for Scholars & University of San Diego, Working Paper Series on Civil Engagement and Public Security in Mexico.
16. Datamacro, M. (2021). *Global Peace Index. 2020 Global Peace Index Ranking*. <https://datosmacro.expansion.com/demography/global-peace-index>
17. Legislative Decree 635 (1991). Penal Code. The Peruvian, April 3, 1991.
18. Etikan, I. & Babetope, O. (2019). *A basic approach in sampling methodology and sample size calculation*. Med Life Clinic, 1(2), 1006.
19. Eurostat. (2020). *Archive: Crime Statistics*. [https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Crime\\_statistics/es&oldid=506895](https://ec.europa.eu/eurostat/statisticsexplained/index.php?title=Crime_statistics/es&oldid=506895)
20. Hernández, R., Fernández, C. and Baptista, P. (2014). *Research methodology*. 6th Ed. Mac Graw Hill. Mexico. ISBN 9781456223960
21. INEI. (2018). *Peru: Statistical Yearbook of Crime and Citizen Security 2011 – 2017*. Departmental, Provincial and District Vision. [https://www.inei.gov.pe/media/MenuRecursivo/publicaciones\\_digitales/Est/Lib1534/libro.pdf](https://www.inei.gov.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1534/libro.pdf)
22. Kesavan, G. & Viswanathan, P. (2016). A 24 hour IoT framework for monitoring and managing home automation. in Proc. *Int. Conf. Inv. Comput. Technol. ICCT 2016*, vol. 1. <https://iopscience.iop.org/article/10.1088/1757-899X/899/1/012011>
23. Leatherdale, S. (2019). *Natural experiment methodology for research: a review of how different methods can support real-world research*. International Journal of Social Research Methodology, 22(1), 19-35.
24. Law 27933 (2003). *Law of the National Citizen Security System*. The Peruvian, February 11, 2003
25. Madrid, C. and Palomino, W. (2020). *Opportunities for corruption and pandemic: government compliance as an effective protector within public organizations*. *From the South*, 12 (1), 213-239. <https://dx.doi.org/10.21142/des-1201-2020-0014>
26. MSP. (2021). *District action plan for citizen security District of San Martin de Porres*.
27. Social Mexico. (2021). *If it were a country, Guanajuato would be one of the most violent in the world*. <https://www.mexicosocial.org/guanajuato-de-los-most-violent-in-the-world/>
28. Martinez, A. and Campos, W. (2015). Correlation between Registered Social Interaction Activities with New Technologies and the degree of Social Isolation in Older Adults. *Mexican Journal of Biomedical Engineering*, 36(3), 181-191. <https://doi.org/10.17488/RMIB.36.3.4>
29. Martinez, J. (2018). The paradigm of security and tensions with human rights. *Utopia and Latin American Praxis*, (23), 1. <https://doi.org/10.5281/zenodo.1462116>
30. Muggah, R. and Szabo, I. (2014) *Changes in the Neighborhood: Reviewing Citizen Security in Latin America*, Strategic Paper 7, retrieved from Igarapé Institute website: [https://igarape.org.br/wpcontent/uploads/2014/03/AE-07-Changes-in-the-Neighborhood\\_10th\\_march.pdf](https://igarape.org.br/wpcontent/uploads/2014/03/AE-07-Changes-in-the-Neighborhood_10th_march.pdf)
31. Muggah, R. (2017). The Rise of Citizen Security in Latin America and the Caribbean. *International Development Policy Review internationale de politique de développement*, (9), 291-322. <https://doi.org/10.4000/poldev.2377>
32. Muggah, R. & Aguirre, K. (2018). *Citizen Security in Latin America: Facts and Figures*. Igarape Institute (33), 22.
33. Numbing. (2021). *Crime Index by Country 2021 Mid-year*. <https://es.numbeo.com/criminality/classifications-by-pa%C3%ADs>
34. Peñaška, M., Soltés, V., & Vefas, A. (2020). *Smart Cities And Modern Views On Citizen Security*. procedures of CBU in Social Sciences, 1, 179-185.
35. Quezada, N. (2010). *Investigation methodology. Applied Statistics in Research*. Ed Macro. Lime. ISBN 9786124034503
36. Quintero, S. (2020). Citizen security and community participation in Latin America. *General Scientific Journal José María Córdova*, 18(29), 5-24. <http://dx.doi.org/10.21830/19006586.561>
37. Rodríguez, J., Duarte, Y., Gómez, C., and Cadavid, J. (2018). Citizen security, violence and crime: a holistic and criminological view of the 2018 statistical figures. *Revista Criminalidad*, (61), 3. ISSN 1794-3108. [http://www.scielo.org.co/scielo.php?script=sci\\_arttext&pid=S1794-31082019000300009](http://www.scielo.org.co/scielo.php?script=sci_arttext&pid=S1794-31082019000300009)
38. Rodríguez, S. (2019). *Crime of aggravated robbery and its impact on citizen insecurity, in the district of Los Olivos* [Master's Thesis, Federico Villarreal National University]. <http://repositorio.unfv.edu.pe/handle/UNFV/3837>
39. Sandoval, L. and Martínez, D. (2008). A review of the study of delinquency and criminality. *Journal of the Faculty of Economic Sciences: Research and Reflection*, 16(1), 105-117. <https://www.redalyc.org/articulo.oa?id=90916108>. Numbeo, (2021). *Crime Index by Country 2021 Mid-year*. <https://es.numbeo.com/criminality/classifications-by-pa%C3%ADs>
40. Sanchez, M. (2017). *Gender as a conditioning factor of female victimization and criminality*. Papers: Journal of Sociology. 102(2), 6. DOI: 10.5565/rev/papers.2337.
41. Sanchez, V. (2017). *Crime and citizen security in the Peru of the 21st century*. Thesis (Master's Degree in Public Management) Universidad del Pacífico. [https://repositorio.up.edu.pe/bitstream/handle/11354/1604/Victor\\_Tesis\\_maestria\\_2016.pdf?sequence=1&isAllowed=y](https://repositorio.up.edu.pe/bitstream/handle/11354/1604/Victor_Tesis_maestria_2016.pdf?sequence=1&isAllowed=y)
42. Schober, P., Boer, C., & Schwarte, L. (2018). *Correlation coefficients: appropriate use and interpretation*. *Anesthesia & Analgesia*, 126(5), 1763-1768.
43. Seeram, E. (2019). *An overview of correlational research. radiologic technology*, 91 (2), 176-179.
44. Suarez, J. (2019). *A novel low processing time system for criminal activity4s detection applied to command and control citizen security centers*. Information, Information 2019, 10, 365; doi:10.3390/info10120365
45. Valderrama, S. and Jaime, C. (2019). *The development of the thesis. Descriptive, comparative, correlational, and quasi-experimental*. Ed. San Marcos. Lima Peru. ISBN 9786123155926
46. Vasquez, M. (2017). *Citizen Security and the influence of citizen participation in crime prevention strategies. The case of the neighborhood of San Juan, Quito, Ecuador, 2009-2014*. Thesis (Master's Degree in Urban Studies). Latin American Faculty of Social Sciences. Flasco, Ecuador. Retrieved from: <https://repositorio.flascoandes.edu.ec/bitstream/10469/12023/14/TFLACSO-2017MFVC.pdf>
47. Van Steden, R. (2017). *Street pastors: On security, care and faith in the British night-time economy*. *European Journal of Criminology*. Vol. 15(4) 403-420. DOI: 10.1177/1477370817747499.
48. Vilchez, Y. (2019). *Management of information technologies and compliance with the goals of citizen security of the Provincial Municipality of Puno, 2018* [Master's Thesis, Universidad Nacional del Altiplano]. [http://repositorio.unap.edu.pe/bitstream/handle/UNAP/12634/Yban\\_Vilchez\\_Navarro.pdf?sequence=1&isAllowed=y](http://repositorio.unap.edu.pe/bitstream/handle/UNAP/12634/Yban_Vilchez_Navarro.pdf?sequence=1&isAllowed=y)
49. Zangirolami, J., Echeimberg, J., & Leone, C. (2018). *Research methodology topics: Cross-sectional studies*. *Journal of Human Growth and Development*, 28(3), 356-360. [http://pepsic.bvsalud.org/scielo.php?pid=S010412822018000300017&script=sci\\_abstr](http://pepsic.bvsalud.org/scielo.php?pid=S010412822018000300017&script=sci_abstr)
50. M. M. Kamruzzaman, "New Opportunities, Challenges, and Applications of Edge-AI for Connected Healthcare in Smart Cities," 2021 IEEE Globecom Workshops (GC Wkshps), 2021, pp. 1-6, doi: 10.1109/GCWkshps52748.2021.9682055."

51. Md Selim Hossain, MM Kamruzzaman, Shuvo Sen, Mir Mohammad Azad, Mohammad Sarwar Hossain Mollah, Hexahedron core with sensor based photonic crystal fiber: An approach of design and performance analysis," *Sensing and Bio-Sensing Research*, 32, 100426
52. Mingju Chen, Xiaofeng Han, Hua Zhang, Guojun Lin, M.M. Kamruzzaman, Quality-guided key frames selection from video stream based on object detection, *Journal of Visual Communication and Image Representation*, Volume 65, 2019, 102678, ISSN 1047-3203
53. M. M. Kamruzzaman: Performance of Decode and Forward MIMO Relaying using STBC for Wireless Uplink. *JNW* 9(12): 3200-3206 (2014)
54. M. M. Kamruzzaman, "Performance of Turbo Coded Vertical Bell Laboratories Layered Space Time Multiple Input Multiple Output system," *Computer and Information Technology (ICCIIT)*, 2013 16th International Conference on, Khulna, 2014, pp. 455-459.
55. Yan Zhang, M. M. Kamruzzaman, and Lu Feng "Complex System of Vertical Badanjin Lifting Motion Sensing Recognition under the Background of Big Data," *Complexity*, vol. 2021, Article ID 6690606, 10 pages, 2021. <https://doi.org/10.1155/2021/6690606>
56. Md Hossain, MM Kamruzzaman, Shuvo Sen, Mir Mohammad Azad, Mohammad Sarwar Hossain Mollah, Hexahedron Core with Sensor Based Photonic Crystal Fiber, 2021
57. Md Nazirul Islam Sarker, Md Lamiur Raihan, Yang Peng, Tahmina Chumky, MM Kamruzzaman, Roger C Shouse, Huh Chang Deog, "COVID-19: Access to Information, Health Service, Daily Life Facility and Risk Perception of Foreigners during Coronavirus pandemic in South Korea," *Archives of Medical Science*, 2021, <https://doi.org/10.5114/aoms/141164>
58. Y. Shi, S. Wang, S. Zhou and M. M. Kamruzzaman. (2020). Study on Modeling Method of Forest Tree Image Recognition Based on CCD and Theodolite. *IEEE Access*, vol. 8, pp. 159067-159076, 2020, doi: 10.1109/ACCESS.2020.3018180
59. Guobin Chen, Zhiyong Jiang, M.M. Kamruzzaman. (2020). Radar remote sensing image retrieval algorithm based on improved Sobel operator, *Journal of Visual Communication and Image Representation*, Volume 71, 2020, 102720, ISSN 1047-3203 <https://doi.org/10.1016/j.jvcir.2019.102720>.
60. Yuanjin Xu, Ming Wei, M.M. Kamruzzaman, Inter/intra-category discriminative features for aerial image classification: A quality-aware selection model, *Future Generation Computer Systems*, Volume 119, 2021, Pages 77-83, ISSN 0167-739X, <https://doi.org/10.1016/j.future.2020.11.015>.
61. Xing Li, Junpei Zhong, M.M. Kamruzzaman, "Complicated robot activity recognition by quality-aware deep reinforcement learning", *Future Generation Computer Systems*, Volume 117, 2021, Pages 480-485.
62. Bin Yuan, M. M. Kamruzzaman, Shaonan Shan, "Application of Motion Sensor Based on Neural Network in Basketball Technology and Physical Fitness Evaluation System", *Wireless Communications and Mobile Computing*, vol. 2021, Article ID 5562954, 11 pages, 2021. <https://doi.org/10.1155/2021/5562954>
63. Chi, Z., Jiang, Z., Kamruzzaman, M.M. et al. Adaptive momentum-based optimization to train deep neural network for simulating the static stability of the composite structure. *Engineering with Computers* (2021). <https://doi.org/10.1007/s00366-021-01335-5>
64. Poongodi, M., Hamdi, M., Vijayakumar, V., Rawal, B. S., & Maode, M. (2020, September). An effective electronic waste management solution based on blockchain smart contract in 5G communities. In *2020 IEEE 3rd 5G World Forum (5GWF)* (pp. 1-6). IEEE.
65. Poongodi, M., Hamdi, M., Varadarajan, V., Rawal, B. S., & Maode, M. (2020, July). Building an authentic and ethical keyword search by applying decentralised (Blockchain) verification. In *IEEE INFOCOM 2020-IEEE Conference on Computer Communications Workshops (INFOCOM WKSHPS)* (pp. 746-753). IEEE.
66. Poongodi, M., Hamdi, M., Sharma, A., Ma, M., & Singh, P. K. (2019). DDoS detection mechanism using trust-based evaluation system in VANET. *IEEE Access*, 7, 183532-183544.
67. Poongodi, M., Vijayakumar, V., Al-Turjman, F., Hamdi, M., & Ma, M. (2019). Intrusion prevention system for DDoS attack on VANET with reCAPTCHA controller using information based metrics. *IEEE Access*, 7, 158481-158491.
68. Poongodi, M., Nguyen, T. N., Hamdi, M., & Cengiz, K. (2021). Global cryptocurrency trend prediction using social media. *Information Processing & Management*, 58(6), 102708.
69. K, A.; J, S.; Maurya, S.; Joseph, S.; Asokan, A.; M, P.; Algethami, A.A.; Hamdi, M.; Rauf, H.T. Federated Transfer Learning for Authentication and Privacy Preservation Using Novel Supportive Twin Delayed DDPG (S-TD3) Algorithm for IIoT. *Sensors* 2021, 21, 7793. <https://doi.org/10.3390/s21237793>
70. Sahoo, S. K., Mudligeriyappa, N., Algethami, A. A., Manoharan, P., Hamdi, M., & Raahemifar, K. (2022). Intelligent Trust-Based Utility and Reusability Model: Enhanced Security Using Unmanned Aerial Vehicles on Sensor Nodes. *Applied Sciences*, 12(3), 1317.
71. Poongodi, M., Nguyen, T. N., Hamdi, M., & Cengiz, K. (2021). Global cryptocurrency trend prediction using social media. *Information Processing & Management*, 58(6), 102708.
72. Poongodi, M., Hamdi, M., Gao, J., & Rauf, H. T. (2021, December). A Novel Security Mechanism of 6G for IMD using Authentication and Key Agreement Scheme. In *2021 IEEE Globecom Workshops (GC Wkshps)* (pp. 1-6). IEEE.
73. Dhiman, P., Kukreja, V., Manoharan, P., Kaur, A., Kamruzzaman, MM, Dhaou, IB, & Iwendi, C. (2022). A Novel Deep Learning Model for Detection of Severity Level of the Disease in Citrus Fruits. *Electronics*, 11 (3), 495.
74. Dhanaraj, RK, Ramakrishnan, V., Poongodi, M., Krishnasamy, L., Hamdi, M., Kotecha, K., & Vijayakumar, V. (2021). Random Forest Bagging and X-Means Clustered Antipattern Detection from SQL Query Log for Accessing Secure Mobile Data. *Wireless Communications and Mobile Computing*, 2021.
75. Rawal, B. S., Manogaran, G., Poongodi M & Hamdi, M. (2021). Multi-Tier Stack of Block Chain with Proxy Re-Encryption Method Scheme on the Internet of Things Platform. *ACM Transactions on Internet Technology (TOIT)*, 22(2), 1-20.
76. S. V. N. Sreenivasu, S. Gomathi, M. Jogendra Kumar, Lavanya Prathap, Abhishek Madduri, Khalid M. A. Almutairi, Wadi B. Alonazi, D. Kali, S. Arockia Jayadhas, "Dense Convolutional Neural Network for Detection of Cancer from CT Images", *BioMed Research International*, vol. 2022, Article ID 1293548, 8 pages, 2022.
77. Mukesh Soni, Ihtiram Raza Khan, K. Suresh Babu, Syed Nasrullah, Abhishek Madduri, Saima Ahmed Rahin, "Light Weighted Healthcare CNN Model to Detect Prostate Cancer on Multiparametric MRI", *Computational Intelligence and Neuroscience*, vol. 2022, Article ID 5497120, 11 pages, 2022.
78. Mehraj, Haider, D. Jayadevappa, Sulaima Lebbe Abdul Haleem, Rehana Parveen, Abhishek Madduri, Maruthi Rohit Ayyagari, and Dharmesh Dhabliya. "Protection motivation theory using multi-factor authentication for providing security over social networking sites." *Pattern Recognition Letters* 152 (2021): 218-224.
79. Abhishek Madduri. "Human Gait Recognition using Discrete Wavelet and Discrete Cosine and Transformation Based Features." *International Journal of Computer Trends and Technology*, vol. 69, no. 6, June. 2021, pp.22-27.
80. Abhishek Madduri. Content based Image Retrieval System using Local Feature Extraction Techniques. *International Journal of Computer Applications* 183(20):16-20, August 2021.
81. Sharma, D. K., Chakravarthi, D. S., Boddu, R. S. K., Madduri, A., Ayyagari, M. R., & Khaja Mohiddin, M. (2023). Effectiveness of Machine Learning Technology in Detecting Patterns of Certain Diseases Within Patient Electronic Healthcare Records. In *Proceedings of Second International Conference in Mechanical and Energy Technology* (pp. 73-81). Springer, Singapore
82. Chinoy Danesh Dinyar (2013), "Latest Improvements and Treatment Implications of Serious Musculoskeletal Pain", *Journal of Advances in Science and Technology*, ISSN 2230-9659, Vol. V, No. IX, May-2013.
83. Chinoy Danesh Dinyar (2017), "Ideal work Rest Scheduler for Computers Users", *International Journal of Current Research*, ISSN: 0975-833X, Vol. 9, Issue, 06, pp.53055-53059, June, 2017.
84. Chinoy Danesh Dinyar (2017), "Comparing the effectiveness of motor control exercises versus Mckenzie exercises for work related back pain in Wolaitasodo University staff", *International Journal of Current Research*, ISSN: 0975-833X, Vol. 9, Issue, 07, pp.55177-55180, July, 2017
85. Chinoy Danesh Dinyar (2013), "Musculoskeletal Pain: A Study on Various Contributory and Alternative Remedy Methods", *Journal of Advances in Science and Technology*, ISSN 2230-9659, Vol. V, No. X, August-2013.

86. Mehraj, Haider, D. Jayadevappa, Sulaima Lebbe Abdul Haleem, Rehana Parveen, Abhishek Madduri, Maruthi Rohit Ayyagari, and Dharmesh Dhablya. "Protection motivation theory using multi-factor authentication for providing security over social networking sites." *Pattern Recognition Letters* 152 (2021): 218-224
87. Everingham, M., Van Gool, L., Williams, C.K.I. et al. The PASCAL Visual Object Classes (VOC) Challenge. *Int J Comput Vis* 88, 303–338 (2010)
88. C. Farabet, C. Couprie, L. Najman and Y. LeCun, "Learning Hierarchical Features for Scene Labeling," in *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 35, no. 8, pp. 1915-1929, Aug. 2013
89. Geoffrey E. Hinton, Simon Osindero, Yee-Whye Teh; A Fast Learning Algorithm for Deep Belief Nets. *Neural Comput* 2006; 18 (7): 1527–1554
90. G. Ameta, D. B. (2017, February 1). An efficient algorithm for mining frequent itemsets from compressed transactions using matrix approach. A UGC Approved and Indexed with ICI, DOI, Research Gate, Google Scholar, DPI Digital Library, Scopus (under review), Thomson Reuters (under review) ). Retrieved September 17, 2022, from [https://www.ijcseonline.org/pdf\\_paper\\_view.php?paper\\_id=1177&10-IJCSE-01969.pdf](https://www.ijcseonline.org/pdf_paper_view.php?paper_id=1177&10-IJCSE-01969.pdf)
91. Ameta, G., & Bhatnagar, D. (1970, January 1). [PDF] an efficient model for secure data publishing: Semantic scholar. undefined. Retrieved September 17, 2022, from <https://www.semanticscholar.org/paper/An-efficient-model-for-secure-data-publishing-Ameta-Bhatnagar/069d6012f3da70eb37696007b4ff12d4136c6b0c>
92. Ameta, G. K., & Bhatnagar, D. (2019). Development of an Association Rule Hiding Algorithm for Privacy Preserving in Market Basket Databases. *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, 8(6S), 525–530. Retrieved September 17, 2022, from <https://www.ijitee.org/wp-content/uploads/papers/v8i6s/F61080486S19.pdf>.
93. Arya, A. D., & Ameta, G. K. (2017). Substitution Based Encryption Model for Cloud Data Storage. *International Journal of Research and Scientific Innovation (IJRSI)*, 4(12), 23–27. Retrieved September 17, 2022, from <https://www.rsisinternational.org/journals/ijrsi/digital-library/volume-4-issue-12/23-27.pdf>.
94. Arya, A. D., & Ameta, G. K. (2018). 2-Key Based Substitution Encryption Model for Cloud Data Storage. *International Journal of Research and Scientific Innovation (IJRSI)*, 5(3), 142–147. Retrieved September 17, 2022, from <https://www.rsisinternational.org/journals/ijrsi/digital-library/volume-5-issue-3/142-147.pdf>.
95. Herbert, J.X. and Frederick, Suresh (2022). Love and Charity: A Biblical Humanistic Study of Kurt Vonnegut’s God Bless You Mr. Rosewater. *World Journal of English Language (ISSN 1925-0703 E-ISSN 1925-0711)* Vol. 12, No. 5. 83-89. DOI:10.5430/wjel.v12n5p83 URL: <https://doi.org/10.5430/wjel.v12n5p83> <https://www.sciedupress.com/journal/index.php/wjel/article/view/21923/13608>
96. Herbert, J.X. and Frederick, Suresh (2021). The Emerging Science and Space Technologies in Kurt Vonnegut’s The Sirens of Titan Originating and Deteriorating a Posthuman Culture. *Multicultural Education (ISSN:1068-3844)* Vol 5, Issue11. 199-204. DOI: 10.5295/zenodo.5644270
97. Olives G, Silvia and Frederick, Suresh (2021). A Post-Colonial View on David Malouf’s Remembering Babylon. *Multicultural Education. (ISSN:1068-3844)* Vol 5, Issue 11. 195-198. DOI: 10.5294/zenodo.5644269
98. Herbert, J.X. and Frederick, Suresh (2021). Kurt Vonnegut’s Cat’s Cradle, a Fictional Framework of Posthumanism: The Interdependent Similarities between Novel and the Theory. *Dogo Rangsang Research Journal (ISSN : 2347-7180)* Vol-08 Issue-14 No. 03. 213-220. DOI : 36893.DRSR.
99. Olives G, Silvia and Frederick, Suresh (2021). Land as “Terrain of the Conscious” in David Malouf’s Fly Away Peter”. *Dogo Rangsang Research Journal ISSN : 2347-7180 Vol-08 Issue-5 No. 03. 221-226. DOI : 10.36893.DRSR.*
100. Frederick and Suresh and Herbert, J. X. (2021). A Posthuman Gestation of Cyborg War Machines in Kurt Vonnegut’s The Sirens of Titan”. *Journal of Language and Linguistic Studies (ISSN 1305-578X)* Vol 17, No 4. 2494-2502
101. Frederick, Suresh and Herbert, J. X. (2021). Speculating the Posthuman Scenario of Man vs Machines in Kurt Vonnegut’s Player Piano. *Journal of Language and Linguistic Studies (ISSN 1305-578X)* Vol 17, No 4. 2503-2511.
102. Frederick, Suresh and Olives G, Silvia. (2021). Effect of Colonial Power on Hybridization in David Malouf’s Remembering Babylon”. *Journal of Language and Linguistic Studies (ISSN 1305-578X)*. 2512- 2518.
103. Frederick, Suresh and Olives G, Silvia. (2021). A Study on the Intrinsic Value of Beings in Amitav Gosh’s The Hungry Tide. *Journal of Language and Linguistic Studies (ISSN 1305-578X)* Vol 17, No 4 (pages 2519 - 2528)
104. Frederick, Suresh and Herbert, J. X. (2021). Posthumanist Ambiguous Identities in Kurt Vonnegut’s Mother Night. *English Forum (ISSN 2279-0446)* Vol.8 & 9. 144-155.
105. Miyolaa SRK, Shiny and Frederick, Suresh. (2022). An Overview of Arthurian Literature. *BODHI: International Journal of Research in Humanities, Arts and Science. (E-ISSN: 2456-5571)*Vol: 6 Issue 2. 07-09.
106. Frederick, Suresh and Olives G, Silvia. (2022). A Postcolonial Reading of David Malouf’s Jacko’s Reach. *Third Concept (ISSN 0970-7247)* Vol. 36 No. 423. 31-32.
107. Moses J, Edwin and Frederick, Suresh. (2021). Violation of Land Ethic in Henry Lawson’s “The Loaded Dog”. *Sambodhi (ISSN: 2249-6661)* Vol-44 No.-01 J. 37-38.
108. Joe, F. Frazer Frank and Frederick, Suresh. (2020). Song as a Means of Enhancing Vocabulary: A Strategy in English as a Second Language Acquisition Among Fifth Standard Students. *Our Heritage (ISSN - 0474-9030)*. Volume 68 Issue 30. 12394 –12400.
109. Joe, F. Frazer Frank and Frederick, Suresh. (2020). A Strategy to Develop Vocabulary in English through Songs for Second Language Acquisition. *INFOKARA RESEARCH (ISSN:1021-9056)*. Volume 9 Issue 3. 321 – 329.
110. Samuel A. Jeba Issac and Frederick, Suresh. (2019). Reading Supplement to Enhance Call Programme. *INFOKARA RESEARCH (ISSN:1021-9056)*. Volume 8 Issue 8. 560-565.
111. Frederick, Suresh. (2019) A Passionate and Competent Teacher: The Role of Avocation and Vocation in Robert Frost’s “Two Tramps in Mud Time”. *International Journal of Research in Social Sciences (ISSN: 2249-2496)*. Vol.9 Issue 5. 105-107.
112. Syed Omar and Ch. Mallikarjuna (2016), “Analysis of the Macroscopic Relations for No-Lane Based Heterogeneous Traffic Stream”, *International Conference: Sustainable Development of Civil Urban and Transportation Engineering (CUTE’2016)*, Ho Chi Minh City, Vietnam, April 11 – 14.
113. Syed Omar and Ch. Mallikarjuna (2016), “Analysis of the Macroscopic Relations for No-Lane Based Heterogeneous Traffic Stream”, *Procedia Engineering*, Vol.142, Pages 244–251.
114. Syed Omar B., Pranab K., and Mallikarjuna, C (2018), “Determination of the PCEs for multilane divided rural highways under heterogeneous traffic conditions”. *TRB Paper No. 18-02596*, Transportation Research Board (TRB), 97th Annual meeting. Washington, DC. USA, January, 2018.
115. Syed Omar B., Pranab K., and Mallikarjuna, C., (2018), “Passenger Car Equivalents for the Heterogeneous Traffic on Divided Rural Highways based on Simulation Model”. *Transportation in Developing Economies (TIDE)*, Vol 4 (14).
116. Dr. Syed Omar Ballari., (2019), “Estimation of Passenger Car Equivalents for Heterogeneous Traffic Stream”, *International Journal of Innovative Technology and Exploring Engineering (IJITEE)*, April 2019, Vol.8 (6), Pages 1026-1031.
117. Syed Omar B., Pranab K., and Mallikarjuna, C., (2019), “Passenger Car Equivalent Estimation for Rural Highways: Methodological Review, 15th World Conference on Transport Research
118. Dr. Syed Omar Ballari., (2019), “Area Occupancy characteristics in Traffic flow on Urban Highway: A case Study”, *Journal of Advanced Research in Dynamical and Control Systems (JARDCS)*, November 2019, Vol.11 (10), Pages 18-26.
119. Dr. Syed Omar Ballari., (2020), “Passenger-car equivalent estimation methods of trucks in traffic stream”, *International Journal of Recent Technology and Engineering (IJRTE)*. January 2020, Vol.8 (5), Pages 710-716.
120. Syed Omar Ballari (2022), “An Empirical Approach for Evaluation and Improvement of Roundabouts in Hyderabad”, *Yantu Gongcheng Xuebao/Chinese Journal of Geotechnical Engineering*, February 2022, Vol 44 (02), pp. 6– 13.

121. Skanda M G, V Ramesh, "Industrial Accidents and Individual Differences: A Review on Personality Traits and Accident Proneness in Manufacturing Sectors", *Journal of Advanced Research in Dynamical & Control Systems*, Vol. 10, 05-Special Issue, 2018, ISSN 1943-023X.
122. Skanda M G, V Ramesh, D Arunkumar, "Human Machine Interaction and Safety: Identification of Human Errors through Task Analysis", *Journal of Material Science and Mechanical Engineering (JMSME)*, p-ISSN: 2393-9095; e-ISSN: 2393-9109; Volume 3, Issue 6; July-September 2016 pp. 433-437.
123. Skanda M G, V Ramesh, D Arunkumar "Human error analysis: A case study in a Tyre Tube Polymer Processing Industry", *International Journal of Latest Trends in Engineering and Technology (IJLTET)*, ISSN: 2278-621X, Volume 7 Issue 2 - July 2016, 1-7.
124. Kashid, A. A., Patil, D. J., Mali, R. D., Patil, V. P., Neethu, T. V., Meroliya, H. K., ... & Iyer, S. (2021). Bimetallic Ni–Pd Synergism—Mixed Metal Catalysis of the Mizoroki–Heck Reaction and the Suzuki–Miyaura Coupling of Aryl Bromides. *Catalysis Letters*, 151(2), 353-358.
125. Bangar, P. G., Nahide, P. D., Meroliya, H. K., Waghmode, S. A., & Iyer, S. (2021). Oxime ligands for Pd catalysis of the Mizoroki–Heck reaction, Suzuki–Miyaura coupling & annulation reactions. *Synthetic Communications*, 51(2), 308-316.
126. Deshmukh, J. M., Mahind, L. H., Waghmode, S. A., & Dagade, S. P. (2017). Study of catalytic activity of silica supported Schiff base complexes. *Asian Journal of Chemistry*, 29(7), 1455-1458.
127. Pawar, S., Kalyankar, V., Dhamangaonkar, B., Dagade, S., Waghmode, S., & Cukkemane, A. (2017). Biochemical profiling of antifungal activity of betel leaf (*Piper betle* L.) extract and its significance in traditional medicine. *J Adv Res Biotech*, 2(1), 1-4.
128. Gauri, B., Vidya, K., Sharada, D., & Shobha, W. (2016). Synthesis and characterization of Ag/AgO nanoparticles as alcohol sensor. *Res J Chem Environ*, 20(10), 1-5.
129. Joshi, P. N., & Waghmode, S. (2016). Graphene quantum dot-based on-chip electrochemical DNA hybridization sensor for pancreatic cancer. *Reports in Electrochemistry*, 6, 31.
130. Kalyankar, V. K., Gadale-Dagade, S., & Waghmode, S. (2015). Biosynthesis of Silver nanoparticles using isolated superoxide dismutase enzyme from novel source *Papaverum somniferum* L. *Res. J. Chem. Environ*, 19(3), 44-48.