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Worldwide crime map applications and usage tendency

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ABSTRACT

In the dynamic structure of the 21st century, the fight against crime is of increasing interest to the whole society. Law enforcement agencies use crime maps in order to analyze all components of the crime and see them in a single window to develop various scientific strategies. Crime maps that have been used actively for the last 70 years have been given different capabilities with the recent developments in geographic information systems (GIS). In this way, effective crime analyzes can be made, crime prevention tactics and strategies can be developed. Crime information systems, which make it easier to see the events at the desired scale and make quick decisions, are actively used by every law enforcement unit. In some developed countries, crime maps are available to citizens. In our country, a study based on the general framework of a web-based crime information system was carried out with the survey method, which included expectations from the crime map on an international scale. The survey conducted with military personnel of NATO members concluded that a significant majority of respondents were concerned with crime maps and believed that crime maps should be made available to all citizens.

1. INTRODUCTION

The phenomenon of crime is seen as a threat that continues its existence with the history of humanity throughout the world due to its universal feature. Even if it is not possible to reduce this threat to zero, reducing the number and effects of crimes can increase the sense of security, starting from small-scale law enforcement units and extending to large-scale countries (Kanlı and Kaplan, 2018).

In every country, there are organizations that are overseen by the states, that follow up and try to prevent crimes. These organizations want to be able to see the developing situations in a single window. They do this to the extent that their technology allows, and they do some analysis and develop a strategy. Computer technology plays an important role in determining appropriate strategies.

In recent years, with the rapid progress of smart technologies, the concept of smart city has gained a great reputation and a more holistic approach has been adopted for the improvement of urban services in many cities (Başkaya et al., 2020). For example, in the centers that control the tracking of the patrol, it can guide the patrol vehicles or personnel in a healthy way by following the vehicle tracking system and similar applications by using GPS and map location information (Arık, 2019).

The progress of law enforcement in this direction will enable both a more proactive approach and a more appropriate and efficient use of law enforcement agencies. This will mean using resources more efficiently, providing safer settlements and a more prosperous life for citizens (Alkan and Karamanoğlu, 2020).

Crime maps are generally used in the public security system. Although the local academic circles do not draw enough attention to the issue of making these maps public, the fact that the crime map can be studied includes the participation of the citizens in the criminal administration and the inclusion of the effects of the society on this administration in a wide range. Crime maps have been published in foreign countries for nearly two decades. Countries such as England and America have rich application areas. In the United States, the crime reports website collaborates with more than 1,800 law enforcement agencies. American citizens can directly check the

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number, location, time, type and other information of crimes in various regions and time zones, and can even view identification information, including photos of the suspect in sexual crimes (Yong, 2015).

2. USE OF WEB-BASED CRIME MAPS

It is possible to say that there are 3 main user classes of crime maps in western societies (Rich, 1995). In the first group, there are judicial units, and we can describe them as law enforcement, courts, prison and institutions within the correctional mechanism. Institutions within the prison and correctional mechanisms make analyzes by comparing the addresses of the parolees and the risk areas where they can commit crimes. Another study on this subject is to monitor these people with the GPS system, to determine where they are going on the map and to keep them under control. The second group is non-governmental organizations that take part in the community-supported security model approach. Non-governmental organizations use crime maps in order to be effective in the activities they carry out for the prevention of crime and to analyze the results of their work visually, and direct their work through the analyzes made in this direction. Crime maps and crime information have been made available to the public via the internet by many police agencies in the United States, and it is therefore desirable for the public to have information about crime in their area and to support law enforcement in their work (Wartell, 2001). The third group that uses crime maps is commissions and special task groups working on crime-related issues. These commissions and groups use crime maps to evaluate and direct their work on the map.

Today, with the advancement of technology, real-time reporting of crime incidents has now become possible using smartphones. Although different tools and techniques are used to examine and interpret crime issues, the use of Geographic Information System (GIS) via mobile application is not widespread enough yet (Maghanoy, 2017). In our country, crime information systems are actively used by all three law enforcement agencies. Police, Gendarmerie and Coast Guard agencies have GIS-supported information systems that show the crimes committed as well as preventive measures. In addition, the Security and Emergency Coordination Center (GAMER), a new formation aiming to direct law enforcement, and 112 emergency aid systems a3re GIS-based and work on notification management. As the response teams are integrated with these systems, more effective operations can be carried out. All these systems can only be used by law enforcement via the intranet network, and a web-based crime information system has not been implemented yet.

2.1. Web-Based Information Systems Application

It will be extremely important to obtain real-time updates on where crime is, as well as intelligence information showing where crime may occur in the future (Wartell, 2011). In addition to the use of crime maps by law enforcement, these maps have also been made available to citizens in several developed countries. It can be said that the number of projects benefiting from GIS in the USA for the prevention of crime is increasing. Web-based crime maps are presented with various crime statistics in order to increase public awareness of crime on the internet. It is seen that these applications, which attract the attention of citizens, have an impact on crime rates in terms of the advantages they provide and the results obtained (Kanlı and Kaplan, 2018). In 2014, IOS proposed the use of crime mapping system-based multisourcing in cloud architecture in the operating system. Consisting of a server and processor running in the cloud, users entering the website through the application are intended to interact with criminal content. With the mobile application, it has been made possible to meet the entered incident report and crime map on a single screen. In this way, users can view and interpret the crime that occurs on digital crime maps (Phiri and Lubobyai, 2020; Figure 1). By noticing the crimes near the users and developing measures against crime, it can be evaluated within the framework of preventive law enforcement activities.

Figure 1. Example of crime application (Url-1)

Application examples regarding the use of crime information systems supported by crime maps worldwide as of 2019 are presented below. In Greece, a Google Maps-based crime map for the city of Athens has been put into use (Figure 2). Maps, which contain limited information for the use of citizens, include date and address information as well as crimetypes.

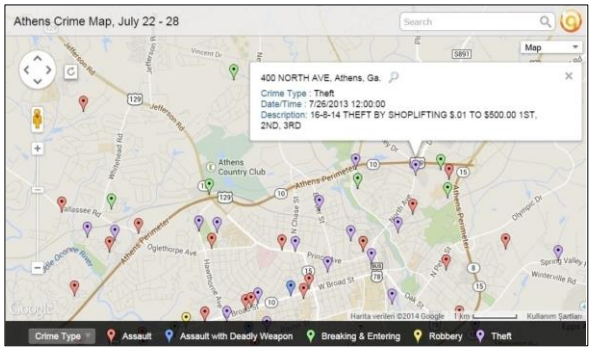

Figure 2. Athens City crime map application (Url-2)

The crime map of the city of Los Angeles was created with the Open Street map infrastructure. By publishing the crime types monthly, the increase and decrease rates of a certain period can be followed (Figure 3).

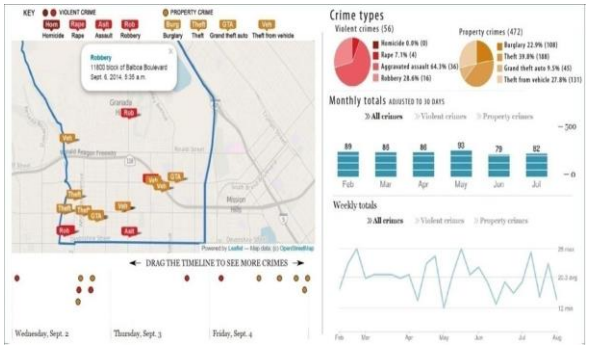

Figure 3. Application of the City of Los Angeles crime map (Url-3)

The Chicago crime map is built on the base map of the city. The crime map, which deals with all types of crimes in detail, also provides convenience to the user with address, zip code, region and known point search tools. The results are presented in the form of points and point clouds (Dalan, 2015; Figure 4).

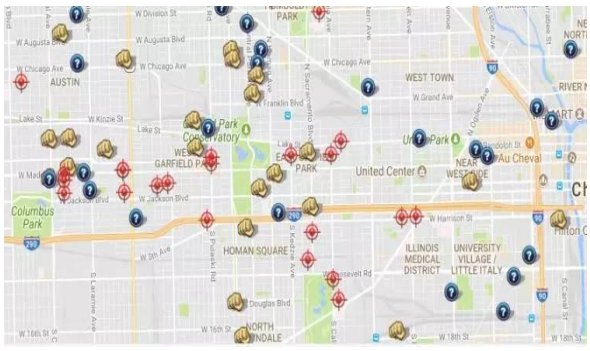

Figure 4. Chicago crime map application

On the San Francisco city crime map, the user can select the base map from different alternatives such as Bing, Google maps or ESRI. All crime types can be investigated at a known point or address, and can also be converted into reports in .csv, .json, .pdf, .rss, .xls, xlsx and .xml formats (Url-1;Figure 5).

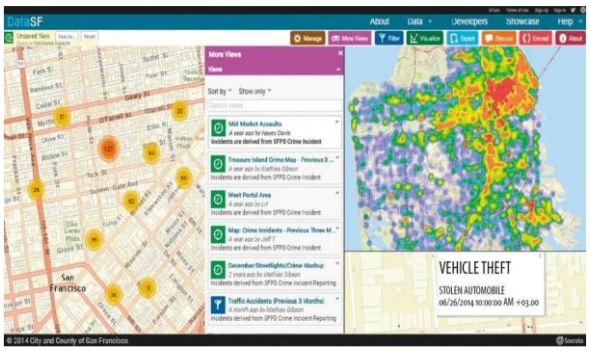

Figure 5. San Francisco City crime map application

The web-based crime information system called Crime Reports provides Google maps-based crime maps throughout the USA and Canada. Unlike the others, the site, which reports weekly and monthly periods, can also send updates to users (Dalan, 2015; Figure 6).

Figure 6. USA and Canada crime map application

In the UK, transport police have prepared crime maps to show crimes that occur on trains and stations. The crimes and crime rates at the selected stations can be seen graphically (Dalan, 2015; Figure 7).

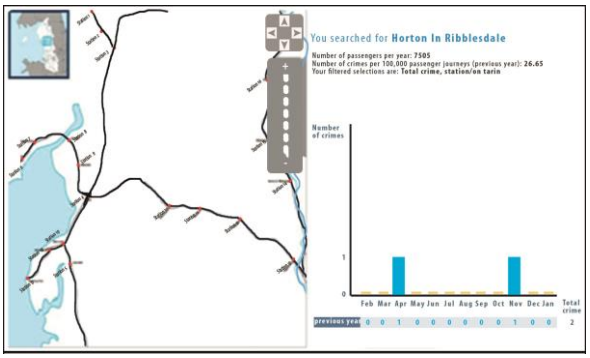

Figure 7. UK Transport police crime map application

The Crime Mapping site presents crimes and law enforcement agencies across the United States to users using ESRI-based maps. The events that occurred are listed by selecting the region or known law enforcement unit to be viewed. Users can get printouts of statistical information (Dalan, 2015; Figure 8).

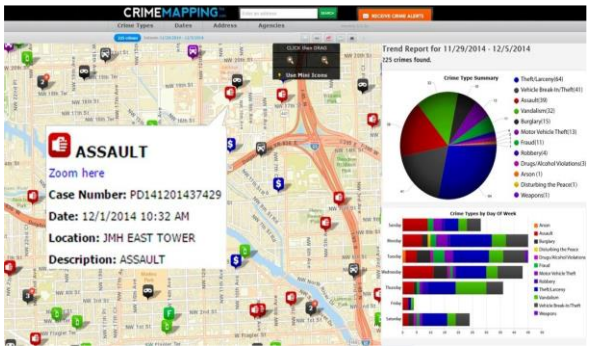

Figure 8. UK Transport police crime map application

London crime map presents crimes committed in the city center using maps based on Open Street maps. The amount of crime in a selected region or a marked area can be displayed. In addition, the crimes of the desired date are among the system outputs (Dalan, 2015; Figure 9).

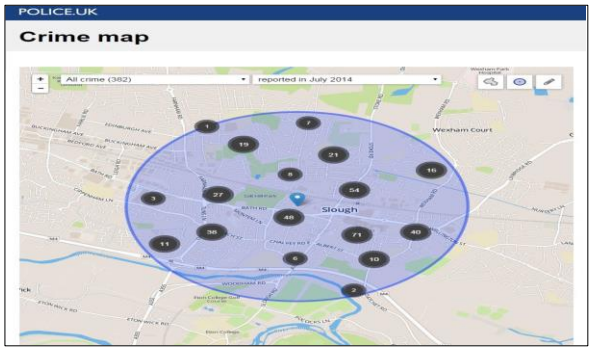

Figure 9. London crime map application

Oakland crime map offers maps based on Open Street map where all crime types can be viewed. In the system where information has been included since 2007, location, date, time and day information of each event is included (Dalan, 2015; Figure 10).

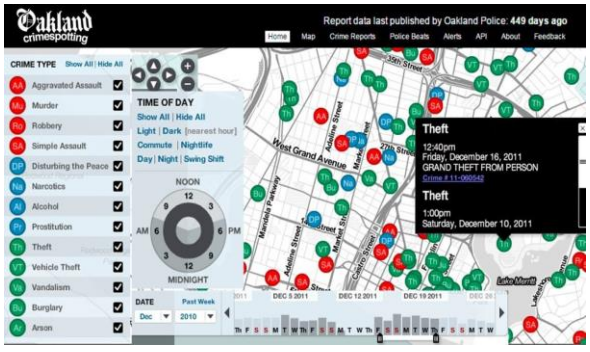

Figure 10. Oakland crime map application

With the security map application in Korea, risky areas are presented to users (Figure 11).

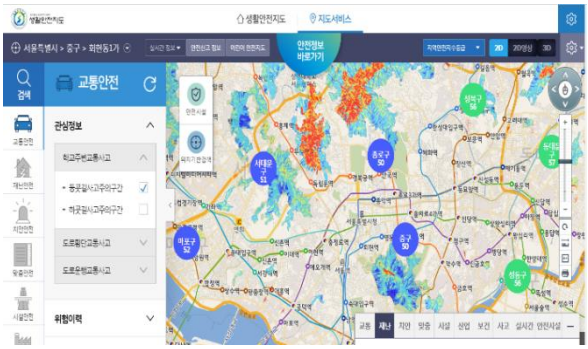

Figure 11. Korea security map application (Url-3).

Crime map for Tokyo city of Japan is published and image is provided for a limited area (Figure 12).

Figure 12. Tokyo city crime map application (Url-4)

With the refugee migrant crime map application, Germany publishes the crimes committed by refugees and immigrants in the country other than its own citizens through a web-based crime information system (Figure 13).

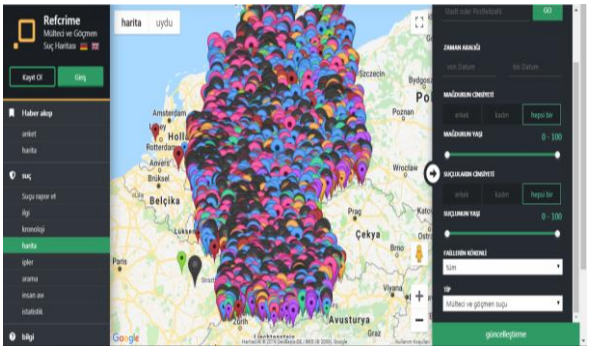

Figure 13. Crimes committed by refugees and immigrants (Url-5)

All necessary statistics about traffic accidents are published on official websites with maps (Url-6) in which the crimes committed throughout the country are shown thematically (Figure 14). The places where the accidents are concentrated on the roads are shown on the map with two-year data sets. (Alkan and Karamanoğlu, 2020).

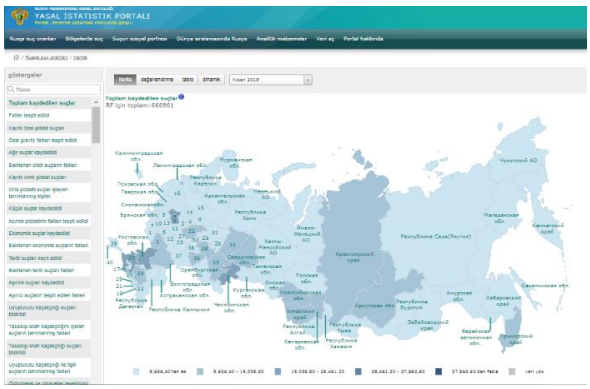

Figure 14. Russia crime map application

There is no web-based crime map application in our country yet. Closed-circuit crime information systems, which are used only for the purpose of facilitating the management of statistics and helping the law enforcement personnel in developing law enforcement strategies, contain crime maps (Url-6).

3. SURVEY STUDY ON THE USE OF CRIME MAP

Table 1. Descriptive feature

Groups	Frequency (n)	Percent (%)
Age Groups		
30 and below	30	23,1
31-40	52	40,0
41 and older	48	36,9
Countries		
USA	10	7,7
Germany	6	4,6
Denmark	7	5,4
Holland	8	6,2
England	22	16,9
Italy	7	5,4
Mongolia	2	1,5
Poland	13	10,0
Romania	8	6,2
Turkey	43	33,1
New Zeland	4	3,1
Country Groups		
Turkey	43	33,1
ABD & England	32	24,6
Other NATO Countries	55	42,3
Ranks		
NCO Sergeant	5	3,8
NCO Staff Sergeant	14	10,8
Sergeant Major	23	17,7
Lieutenant	8	6,2
First Lieutenant	11	8,5
Captain	16	12,3
Major	34	26,2
Lieutenant Colonel	12	9,2
Colonel	5	3,8
General	2	1,5
Rank Groups		
NCO	42	32,3
Officer	35	26,9
Senior Officer	53	40,8

In order to reflect the purpose and how the crime maps are used around the world, the table that emerged (Table 1) as a result of the survey that measures the tendency of using a comprehensive crime map with the members of the armed forces in NATO countries who are familiar with the crime issue has been presented as a report below. With this study, which includes countries from different geographical regions such as the USA, England, New Zealand and Mongolia, the majority of them are from European countries, it has been tried to measure the perception of crime map in various parts of the world.

3.1.1. Statistical Analysis of Data

The data obtained in the research were analyzed using the SPSS 22 (Statistical Package for Social Sciences) for Windows program. Number and percentage were used as descriptive statistical methods in the evaluation of the data. K-square analysis was used to compare grouped variables.

3.1.2. Findings and Comments

In order to solve the research problem, the findings and comments based on the findings obtained as a result of the analysis of the data collected through the questionnaire from the participants of the research are as follows;

Participants are evenly distributed according to age. It consists of countries in different geographies such as the USA, European countries and Mongolia and New Zealand, most of which are Turkey.

According to country groups, 43 (33.1%) are in Turkey, 32 (24.6%) are in the USA and England, who are already using the web-based crime information system, and 55 (42.3%) are in their country. disintegrates as other NATO countries that do not use the system. According to rank groups, 42 (32.3%) non-commissioned officers, 35 (26.9%) officers and 53 (40.8%) senior officers.

Table 2. Distribution of trends in crime map

Groups	Frequency (n)	Percent (%)
Usage of Crime Map in Your Country		
Yes, national law enforcement publishes	19	14,6
Yes, juidicial units publish	11	8,5
Yes, but not publicly available	38	29,2
No not used	9	6,9
I dont know	53	40,8
Which Regions to Examine When Examining the Crime Map*		
Near my house	81	62,3
Near my workspace	39	30,0
Near the schools	34	26,2
The whole city	73	56,2
The whole country	29	22,3
Which Crimes to Examine When Examining a Crime Map*		
Sexual crimes	59	45,4
Material crimes	86	66,2
Crimes to person	81	62,3
Drug crimes	65	50,0
Terror crimes	69	53,1
Crime Map Review Request		
Yes I am interested in	78	60,0
Yes, I'll take a look	40	30,8
No, I'm not interested in	12	9,2
For what purpose do we want to examine crime maps*		
For my family safety	92	70,8
Because I wonder what's happining around me	85	65,4
To buy property	42	32,3
To warn others	15	11,5
Should crime maps be made public		
Yes	81	62,3
Partly, not for every crime	37	28,5
Law enforcement should know	12	9,2
Reporting a Crime Status		
If I see, yes	91	70,0
Yes, if they don't get me involved with the formalities	14	10,8
I don't care	12	9,2
By type of crime	13	10,0
How Do You Feel When You See a Crime Nearby on the Crime Map		
I feel better because I have knowledge, I take precautions	88	67,7
I worry	26	20,0
Affects the value of the property	16	12,3
How Crime Maps Will Affect Crime Rate		
Will definitely fall	38	29,2
Makes it fall a little	48	36,9
It has no affect	40	30,8
It allows to increase	4	3,1

*Multiple selected items

It is understood that the participants have an awareness level of 60% regarding the use of crime maps in their country. While examining the Crime Map, 78 (60.0%) of them wanted to examine the crime map on a web-based platform, and they mostly wanted to see the crime map around their homes and then the crime distribution in the whole city. In order to maintain their security, it is seen that a significant part of them show interest in the crime map out of curiosity (Table 2).

The vast majority agree with the view that crime maps should be made available to citizens. Participants who understood the purpose of using crime maps stated that they were inclined to report a crime by 70% and would report the crime if they saw it while it was being committed.

When I see a nearby crime on the crime map, 88 (67.7%) feel better because I have knowledge, I take precautions, 26 (20.0%) worry, 16 (12.3%) where I live found negative effects on its value.

It is seen that the crime maps believe that 66% of them will decrease the crime rates, 30.8% will not have any effect, and 3.2% will increase it.

Table 3. Distribution of trends in crime map by age groups

		30 & below		31-40		41 & older		P
		n	%	n	%	N	%	
Status of using a crime map in your country	Yes, national law enforcement publishes	7	%23,3	5	%9,6	7	%14,6	X2=23,661 p=0,003
	Yes, juidicial units publish	2	%6,7	2	%3,8	7	%14,6	
	Yes, but not publicly available	1	%3,3	16	%30,8	21	%43,8	
	No not used	3	%10,0	4	%7,7	2	%4,2	
	I do not know	17	%56,7	25	%48,1	11	%22,9	
Crime map review request	Yes I am interested	16	%53,3	31	%59,6	31	%64,6	X2=4,016 p=0,404
	Yes, I'll take a look	13	%43,3	15	%28,8	12	%25,0	
	No, I'm not interested	1	%3,3	6	%11,5	5	%10,4	
Should crime maps be made public	Yes	22	%73,3	30	%57,7	29	%60,4	X2=2,329 p=0,675
	Partly, not for every crime	6	%20,0	16	%30,8	15	%31,2	
	Law enforcement should know	2	%6,7	6	%11,5	4	%8,3	
Crime reporting status	If I see, yes	19	%63,3	36	%69,2	36	%75,0	X2=1,821 p=0,935
	Yes, if they don't get me involved with the formalities	4	%13,3	6	%11,5	4	%8,3	
	I don't care	4	%13,3	4	%7,7	4	%8,3	
	By type of crime	3	%10,0	6	%11,5	4	%8,3	
How he feels when he sees a nearby crime on the crime map	I feel better because I have knowledge, I take precautions	18	%60,0	34	%65,4	36	%75,0	X2=14,535 p=0,006
	I worry	3	%10,0	15	%28,8	8	%16,7	
	Affects the value of the property	9	%30,0	3	%5,8	4	%8,3	
How crime maps will affect crime rate	Will definitely fall	5	%16,7	15	%28,8	18	%37,5	X2=15,468 p=0,017
	Makes it fall a little	10	%33,3	22	%42,3	16	%33,3	
	It has no affect	15	%50,0	15	%28,8	10	%20,8	X2=15,468 p=0,017
	It allows to increase	0	%0,0	0	%0,0	4	%8,3	

A significant relationship was found between the use of Crime Map in their country and age groups (X2=23,661; p=0.003<0.05; Table 3). There was no significant relationship between the Request for Crime Map Review and age groups (X2=4.016; p=0.404>0.05). There was no significant relationship between the Opinion of Making Crime Maps for Citizen Use and age groups (X2=2.329; p=0.675>0.05). There was no significant relationship between Reporting a Crime and age groups (X2=1.821; p=0.935>0.05).

A significant relationship was found between the age groups and how they felt when they saw a nearby crime on the crime map (X2=14.535; p=0.006<0.05). A significant relationship was found between How Crime Maps Affect the Crime Rate and age groups (X2=15.468; p=0.017<0.05).

Table 4. Distribution of trends in crime map by country groups

		Turkey		USA and UK		Other NATO Count.		p
		n	%	n	%	n	%	
Status of using a crime map in your country	Yes, national law publishes	0	%0	9	%28,1	10	%18,2	X^2=72,805 p=0,000
	Yes, forensic units publish	0	%0	10	%31,2	1	%1,8	
	Yes, but not publicly available	26	%60,5	1	%3,1	11	%20,0	
	No not used	0	%0,0	0	%0,0	9	%16,4	
	I do not know	17	%39,5	12	%37,5	24	%43,6	
Crime map review request	Yes I am interested in	34	%79,1	13	%40,6	31	%56,4	X^2=14,853 p=0,005
	Yes, I'll take a look	9	%20,9	15	%46,9	16	%29,1	
	No, I'm not interested in	0	%0,0	4	%12,5	8	%14,5	
Should crime maps be made public	Yes.	20	%46,5	25	%78,1	36	%65,5	X^2=13,338 p=0,010
	Partly, not for every crime	19	%44,2	7	%21,9	11	%20,0	
	It would be enough if only law knew	4	%9,3	0	%0,0	8	%14,5	
Crime reporting status	If I see, yes	30	%69,8	26	%81,2	35	%63,6	X^2=12,641 p=0,049
	Yes, if they don't get me involved with the formalities	8	%18,6	2	%6,2	4	%7,3	
	I don't care	3	%7	0	%0	9	%16,4	
	By type of crime	2	%4,7	4	%12,5	7	%12,7	
How he feels when he sees a nearby crime on the crime map	I feel better because I have knowledge, I take precautions	28	%65,1	25	%78,1	35	%63,6	X^2=12,372 p=0,015
	I worry	11	%25,6	0	%0	15	%27,3	
	Affects the value of the property	4	%9,3	7	%21,9	5	%9,1	
How crime maps will affect crime rate	Will definitely fall	24	%55,8	1	%3,1	13	%23,6	X^2=37,985 p=0,000
	Makes it fall a little	11	%25,6	10	%31,2	27	%49,1	
	It has no affect	6	%14,0	20	%62,5	14	%25,5	
	It allows to increase	2	%4,7	1	%3,1	1	%1,8	

A significant relationship was found between the use of a crime map in their country and country groups (X2=72.805; p=0.000<0.05; Table 4). In the USA and England group, the rate of national law enforcement publications is higher than the Turkey group. In the USA and UK group, the rate of publishing yes forensic units is higher than in the Turkey group. In the Turkey group, yes, but not available to the citizens, the rate is higher than the other NATO countries group. In the group of other NATO countries, the rate of no use is higher than in the group of Turkey. In the group of other NATO countries, ignorance is higher than in the US and UK group.

A significant relationship was found between Crime Map Review Request and country groups (X2=14.853; p=0.005<0.05). In the Turkey group, the rate of the desire to examine the crime map is higher than the USA and England groups. In the USA and England group, yes, I look at it from time to time, is higher than the Turkey group. In the group of other NATO countries, the rate of "no, I am not interested" is higher than the group of Turkey.

A significant relationship was found between the Opinion of Making Crime Maps for Citizen Use and country groups (X2=13.338; p=0.010<0.05). The opinion that crime maps should be made available to citizens in the USA and England group is higher than that of the Turkey group. In the Turkey group, the rate, in part, not for all crimes, is higher than the group of other NATO countries. In the Turkey group, the rate of opinion, if only the law enforcement knew, would be sufficient compared to the USA and England groups.

A significant relationship was found between Reporting Crime and country groups (X2=12.641; p=0.049<0.05). If the case of reporting a crime in the USA and England group is in front of my eyes, the rate of being yes is higher than the group of other NATO countries. In the group of other NATO countries, if they do not involve me in formalities, the yes rate is higher than the group of Turkey. The rate

of none of my concern is higher in the Turkey group than in the USA and UK groups. The rate of variation according to crime is higher in the Turkey group than in the USA and UK groups.

A significant correlation was found between the country groups and how they felt when they saw a nearby crime on the crime map (X2=12.372; p=0.015<0.05). The rate of being able to feel better and take precautions is higher in the USA and UK group, as I have information about how they feel when they see a crime close to them on the crime map, compared to the other NATO countries group. In the group of other NATO countries, the rate of worry is higher than in the USA and UK group. In the Turkey group, the rate of negative effects on the value of the place where I live is higher than in the USA and UK groups.

A significant relationship was found between How Crime Maps Affect the Crime Rate and country groups (X2=37,985; p=0.000<0.05). Regarding how the crime maps will affect the crime rate in the Turkey group, the rate of definitely lowering is higher than the other NATO countries group. In the group of other NATO countries, the rate that allows it to fall slightly is higher than the group of Turkey.

In the USA and England group, the rate of no effect is higher than the Turkey group. In the Turkey group, the rate of increase is higher than the other NATO countries group.

Table 5. Distribution of tendencies for crime map by rank groups

		NCO		Officer		Major&up		NCO
		n	%	n	%	n	%	
Status of using a crime map in your country	Yes, national law publishes	%7,1	9	3	%7,1	9	%18,2	X^2=21,951 p=0,005
	Yes, forensic units publish	%4,8	1	2	%4,8	1	%1,8	
	Yes, but not publicly available	%28,6	4	12	%28,6	4	%20,0	
	No not used	%7,1	3	3	%7,1	3	%16,4	
	I do not know	%52,4	18	22	%52,4	18	%43,6	
Crime map review request	Yes I am interested in	%57,1	15	24	%57,1	15	%56,4	X^2=12,695 p=0,013
	Yes, I'll take a look	%26,2	16	11	%26,2	16	%29,1	
	No, I'm not interested in	%16,7	4	7	%16,7	4	%14,5	
Should crime maps be made public	Yes.	%59,5	21	25	%59,5	21	%65,5	X^2=4,886 p=0,299
	Partly, not for every crime	%35,7	8	15	%35,7	8	%20,0	
	It would be enough if only law knew	%4,8	6	2	%4,8	6	%14,5	
Crime reporting status	If I see, yes	%59,5	27	25	%59,5	27	%63,6	X^2=7,988 p=0,239
	Yes, if they don't get me involved with the formalities	%11,9	3	5	%11,9	3	%7,3	
	I don't care	%19,0	1	8	%19,0	1	%16,4	
	By type of crime	%9,5	4	4	%9,5	4	%12,7	
How he feels when he sees a nearby crime on the crime map	I feel better because I have knowledge, I take precautions	%61,9	19	26	%61,9	19	%63,6	X^2=10,639 p=0,031
	I worry	%28,6	8	12	%28,6	8	%27,3	
	Affects the value of the property	%9,5	8	4	%9,5	8	%9,1	
How crime maps will affect crime rate	Will definitely fall	%33,3	5	14	%33,3	5	%23,6	X^2=10,314 p=0,112
	Makes it fall a little	%35,7	13	15	%35,7	13	%49,1	
	It has no affect	%26,2	17	11	%26,2	17	%25,5	
	It allows to increase	%4,8	0	2	%4,8	0	%1,8	

A significant relationship was found between the Crime Map Review Request and rank groups (X2=12.695; p=0.013<0.05; Table 5). In the senior officer group, the rate of wanting to examine the crime map is higher than the officer group. In the officer group, yes, I look at the rate is higher than the senior officer group. In the non-commissioned officer group, the rate of no interest is higher than that of the senior officer group.

There was no significant relationship between the Opinion of Making Crime Maps for Citizen Use and rank groups (X2=4.886; p=0.299>0.05). There was no significant relationship between Reporting a Crime and rank groups (X2=7,988; p=0.239>0.05).

A significant relationship was found between the rank groups and how they felt when they saw a nearby crime on the crime map (X2=10.639; p=0.031<0.05). The rate of being able to feel better and take precautions is higher in the senior officer group than in the officer group, because I have information about how they feel when they see a crime near them on the crime map. The rate of being worried is higher in the non-commissioned officer group than in the senior officer group. In the non-commissioned officer group, the rate of negative effects on the value of the place where I live is higher than the officer group.

There was no significant relationship between How Crime Maps Affect the Crime Rate and rank groups (X2=10.314; p=0.112>0.05).

4. RESULTS

Digital crime maps, which are very useful for law enforcement, serve especially for law enforcement chiefs in recognizing the region and developing precautions as a result of a quick analysis. Discussions on making it available to citizens continue. Despite the view that reporting every crime to the citizen will bring anxiety and insecurity rather than benefit, according to many opinions, transparent law enforcement, transparent justice system and citizens with increased awareness mean a safer society in the long run. After this study, it is seen that crime maps are not available to citizens in many NATO countries, and crime maps are actively used by law enforcement in many of them. However, almost all the participants who participated in the survey stated that they were interested in the crime map, that they wanted to examine it and that they thought it would be useful.

When the security need desired by the society is not met as desired, other needs will not emerge as needs. In order for people to continue their social life, they must first be sure that their own safety of life and property is ensured (Sarı and Özgür, 2019). It can be said that mapping the crimes that occur with GIS is important for the implementation of both "Social Crime Prevention" and "Spatial Crime Prevention" strategies (Kanlı and Kaplan, 2018).

In the twenty-first century, where the use of GIS-supported web-based crime maps is rapidly increasing, it is considered that internet users will show more interest in crime maps and thus contribute to the fight against crime, and that the individual awareness created will have a positive effect on the decrease in crime rates.

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Author Contributions

Musa Atar: Methodology, Software, Validation, Formal analysis, Writing-Original Draft, Visualization. **Hacı Murat Yılmaz:** Supervision, Writing-Original Draft.

Conflicts of Interest

The authors declare no conflict of interest.

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