THE INFLUENCE OF THE CHRONOBIOLOGICAL FACTORS ON THE NUMBER OF HOMICIDES COMMITTED IN THE PLOVDIV DISTRICT OF THE REPUBLIC OF BULGARIA IN THE PERIOD 2008 – 2017

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SUMMARY

Chronobiological factors affect the behavior of people, especially those who commit homicides.

Materials and methodology: The victims of 113 homicides committed in the Plovdiv District during the period 2008 – 2017 were studied. Their autopsies were carried out at the Forensic Medicine Department at Sveti Georgi University Multiprofile Hospital for Active Treatment – City of Plovdiv. The obtained results are processed statistically and are presented graphically.

Most homicides occurred in the winter – 40 (35.40% ± 4.50%), and the least in the summer – 18 (15.04% ± 3.36%). The month with the highest concentration of homicides was January, during which 22 (19.47% ± 3.72%) homicides were committed. The least number of homicides occurred in July, when only 5 people lost their lives (4.42%). In the days of the week, most homicides were committed on Monday – 26 (23.00% ± 3.96%), and the least on Wednesday, Saturday and Sunday – 13. The distribution of homicides during the month showed that most homicides were committed in the middle of the month – from 11th to 20th – 45 (39.82% ± 4.60%).

Key words: homicide, seasons, months, days, dates.

INTRODUCTION:

Rhythm is a characteristic property of life and dead nature. Nowadays it is known that many of the functions and processes in living organisms are repeated periodically. As an indispensable part of the biosphere, man is dependent on the changes occurring therein. Climate, temperature, atmospheric pressure, seasons, months, even the days of the week, influence the rhythm of this process (3). These chronobiological factors affect many diseases in psychiatry, the level of suicides, severe road traffic accidents, and so on. (4, 5, 6, 8, 9). The influence of these factors on homicides is poorly studied (1, 7).

The **AIM** of the present study is to investigate the influence of some of the chronobiological factors on the level and type of homicides in the Plovdiv District of the Republic of Bulgaria in the period 2008 – 2017.

MATERIAL AND METHODOLOGY:

The autopsies of the victims of homicide performed at the Forensic Medicine Department at the Sveti Georgi University Multiprofile Hospital for Active Treatment – City of Plovdiv for the mentioned period were studied. In all cases, forensic expertise was prepared, in which the cause of death was cited as homicide. Depending on the type of injury, we divided the causes of death into four groups: injuries from various types of firearms, injuries caused by objects with sharp tips and cutting edges, also called cold weapons, injuries from hard blunt objects, and death caused by asphyxia (strangulation).

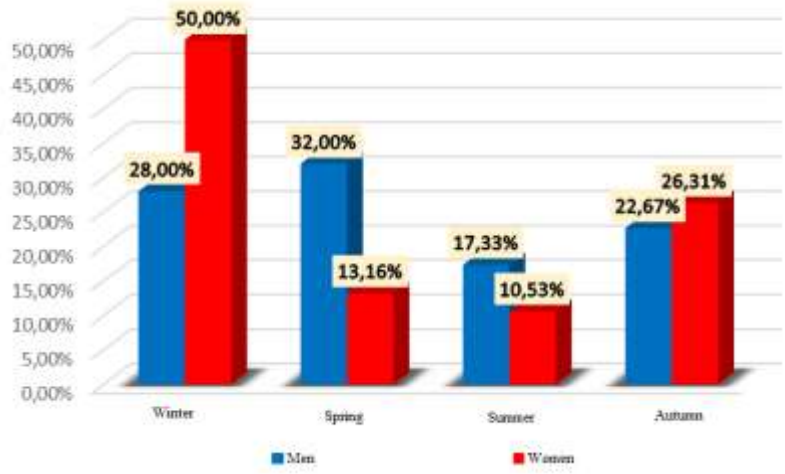
The number of homicides per seasons, months, days of the week and dates, as well as by gender, was tracked. The most commonly used method of killing during the separate seasons, months and days of the week was also determined.

The results were statistically processed and presented graphically (2).

RESULTS:

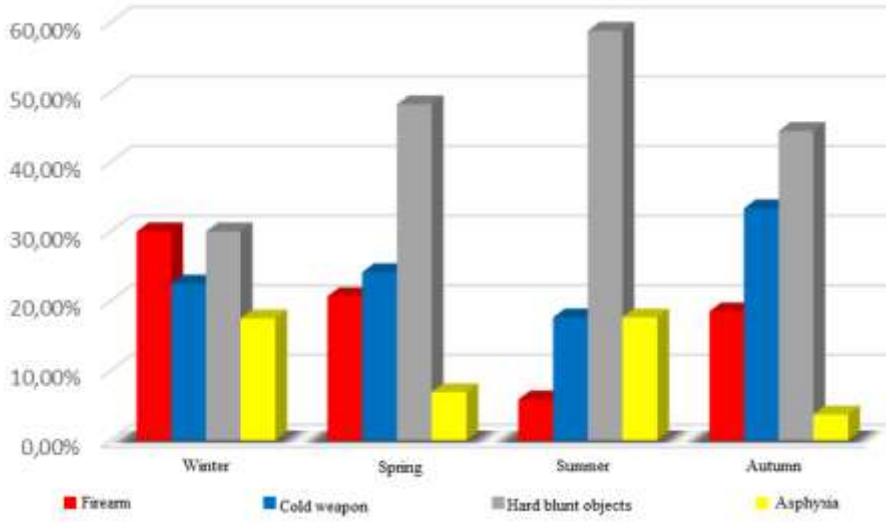
In the period 2008 – 2017 in the Plovdiv District, 113 people have died of homicide, of which 75 are men and 38 are women. A distribution of the total number of homicides committed during the seasons and their relative share by gender was made (Fig.1)

Fig. 1. DISTRIBUTION OF HOMICIDES BY GENDER THROUGHOUT THE SEASONS



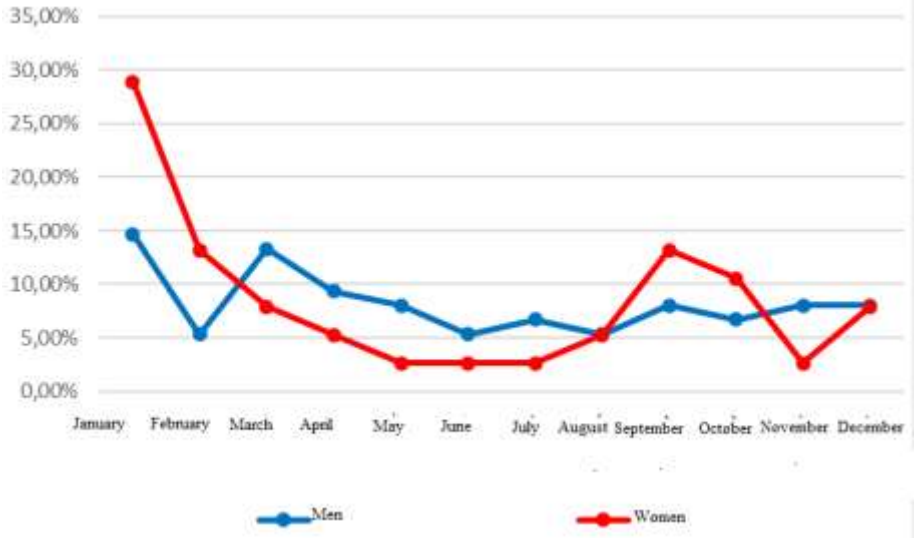
The distribution of the homicides carried out by different means during the seasons was also tracked (Figure 2).

Fig.2. MEANS FOR HOMICIDE THROUGHOUT THE SEASONS



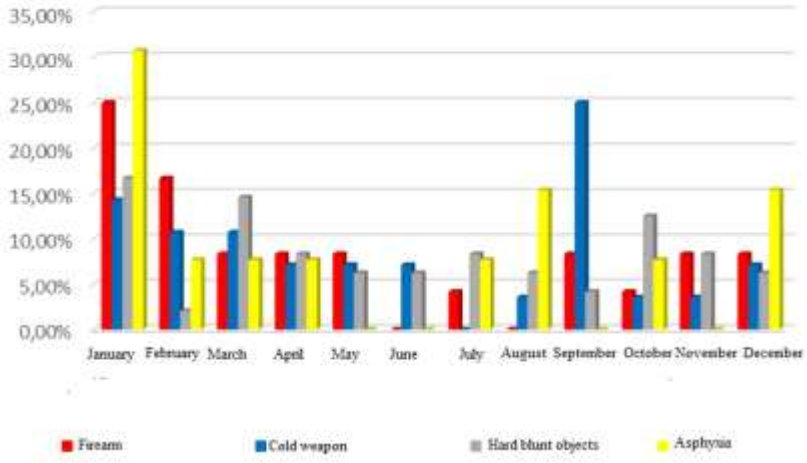
The dynamics of gender-based homicides during the months of the year were also studied (Figure 3).

Fig.3. DYNAMICS OF HOMICIDES DURING THE MONTHS OF THE YEAR



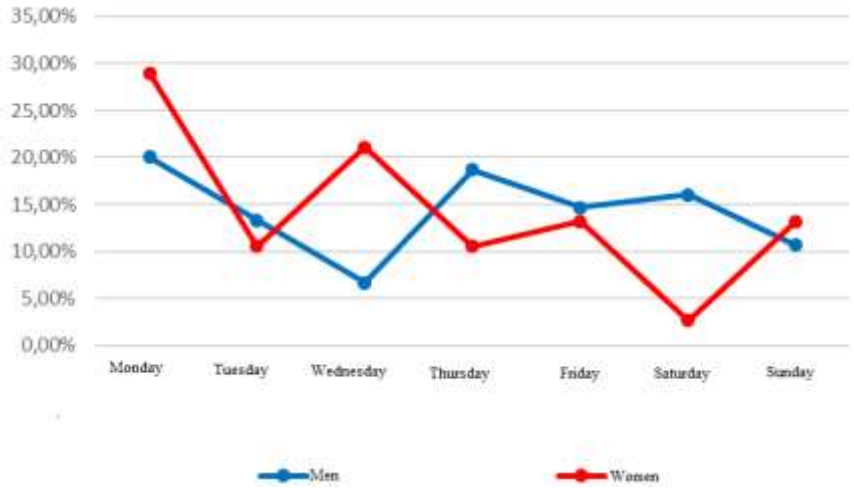
The distribution of the various means for homicide during the months of the year was also studied (Figure 4).

Fig.4. DISTRIBUTION OF THE MEANS FOR HOMICIDE DURING THE MONTHS OF THE YEAR



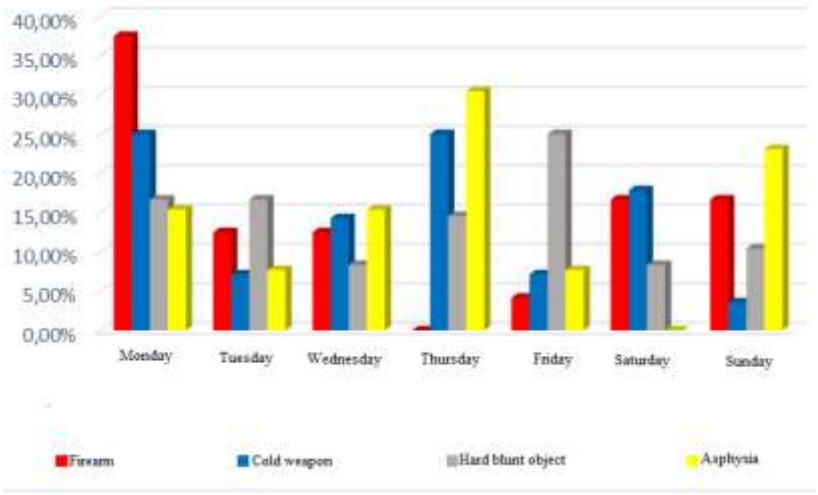
The total number of homicides, as well as the homicides of men and women, is not evenly distributed throughout the days of the week (Figure 5).

Fig.5. DISTRIBUTION OF HOMICIDES BY GENDER THROUGHOUT THE DAYS OF THE WEEK



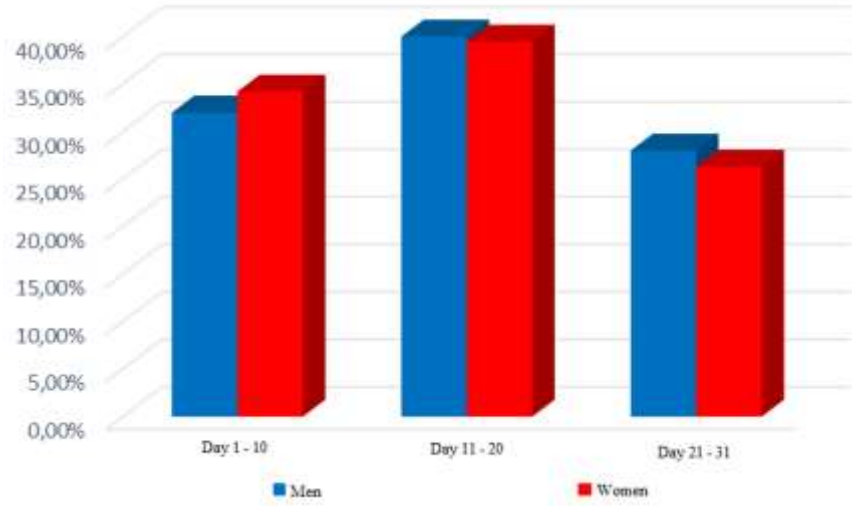
The risk days of the week for the various means for homicide were also determined (Figure 6).

Fig.6. DYNAMICS OF THE MEANS FOR HOMICIDE THROUGHOUT THE DAYS OF THE WEEK



The distribution of homicides by monthly dates grouped in ten days was tracked (Figure 7).

Fig.7. DISTRIBUTION OF HOMICIDES BY MONTHLY DATES



DISCUSSION:

From the data obtained, it is clear that most homicides occur in winter (35.40% ± 4.50%), and the least – during the summer (15.04% ± 3.36%). The peak of homicides of women occurs in the winter when 50% of all women are killed (50.00% ± 8.11%). A second lower peak in homicides of women occurs in the autumn (26.31% ± 7.14%). Homicides of men also show two peaks: lower in winter (28.00% ± 5.18%) and higher in spring (32.00% ± 5.39%).

In winter, the most used means for homicide are firearm and hard blunt objects, with which 30.00% ± 7.24% of the victims were killed during this season. In the rest of the seasons, the largest number is the number of victims killed by hard blunt objects followed by the victims killed by cold weapons. The distribution of homicides by months shows that the months with the highest number of homicides are January (19.47% ± 3.72%) and March (11.50% ± 3.00%). The least homicides are committed in June, July and August. The homicides of men peak in January (14.67% ± 4.08%) and March (13.33% ± 3.92%), while the homicides of women show a marked peak in January (28.94% ± 7, 36%) and three minimums in May, June and July.

The distribution of the number of homicides by months and seasons corresponds to the rhythm of life of the population in the area. The winter months in our calendar are filled with many holidays, and the field work is little. A typical Bulgarian characteristic is to celebrate many of these holidays and to consume large amounts of alcohol and drugs. Brawls arise and aggression occurs, which in some cases lead to death. The summer months include summer leaves, increased field work, fewer holidays, reduced alcohol consumption, and thus, less aggression and homicides.

The distribution of homicides by days of the week shows two peaks – Monday (23.00% ± 3.96%) and Thursday (15.93% ± 3.44%). The least homicides took place on Saturdays and Sundays. Here, we can also see a trend for fewer homicides on weekends. On Monday a maximum is reported, both for homicides of men (20.00% ± 4.62%) and of women (28.95% ± 7.35%). The smallest is the number of men killed on Wednesday and of women killed on Saturday. Monday is after the weekend during which many contacts are taking place, conflicts arise, and aggression occurs the next day.

Most homicides with firearms took place on Monday (37.50% ± 4.55%), with cold weapon – on Monday and Thursday (25.00% ± 4.07%), with hard blunt objects – on Friday (25.00% ± 4.07%) and by asphyxia – on Thursday (30.47% ± 4.47%).

Most homicides are committed with hard blunt objects, probably because they are the most accessible. Fists, kicks, stones, poles and iron are used most often.

Tracking the relationship between the dates and the number of homicides showed that their maximum is in the middle of the month – from 11th to 20th. Periodically, almost every year in the middle ten days of the month, the most homicides are committed.

CONCLUSIONS:

1. Higher risk of homicides is in the winter and, in particular, in January.
2. The largest proportion of homicides of women is committed in the winter, and the largest proportion of homicides of men – in the spring.
3. The highest risk for homicides is on Mondays and the middle ten days of the month.
4. Most homicides with firearms and cold weapons are carried out on January Mondays, with hard blunt objects – on Friday, and by asphyxia – on Thursday.

BIBLIOGRAPHY:

1. Безлов Т., Гунев Ф., Герганов А. 2011, Тенденции на престъпността в България 2000 – 2010 г.; ЦИД София, ISBN 978-954-477-176-8, www.csd.bg.csd@online.bg

2. Димитров И. 2007, Основи на научните проучвания в медицината. Методика и методология. ИК ВАП, Пловдив, ISBN 978-954-9806-71-7.

3. Маджирова Н. 1995, Хронобиологични аспекти на психиатрията, „Полиграфия“ Пловдив.

4. Маджирова Н., Димитров Б. Д., Семерджиева М., Стефанов Р., Петрова Н., 2000 „Хронобиологични и биометериологични проучвания за самоубийствата и опитите за самоубийство“. В „Хронобиология и биометериология в българската медицина“. Пловдив, Макрос, 87-98.

5. Baltov M**.** Seasonal And Monthly Distribution Of Suicides In The Region Of Plovdiv, Committed Over The Period 2000 – 2009; 2014г.
http://journal.sustz.com/VolumeIV/Number1/index.html ISSN:1314-4111

6. Cros J. Alarez J C, Sbidian E, Charlier P, Grandmaison G L; Homicidal Deaths in the Western Suburbs of Paris. A 15 – Year – Study. Am J Forensic Med. Pathol. V 33, №4, 404 – 409. 2012.

7. Global Study on Homicide 2013, Viena (Austria) 2014, ISBN 978-92-1-054205-0.

8. Paavola P. Tiihonen J. Seasonal Variation of seclusion incidents from violent and suicidal acts in forensic psychiatric patients. Int. J of Law and Psychiatric, №33, 27 – 34, 2010.

9. Vougiouklakis T, Tsiligianni C. Forensic and criminological aspects homicide murder means in North – West (Epirus) Greece. J Clin Forensic Med. Aug – Nov; 13 (6-8): 316-20. 2006.