

ASEJ

Scientific Journal

Bielsko-Biala School of Finance and Law

Volume 26 | Number 4 | December 2022

ISSN2543-9103
eISSN2543-411X
www.asej.eu

4.0



Bielsko-Biala

Bielsko-Biala School of Finance and Law
Wyższa Szkoła Finansów i Prawa w Bielsku-Białej

Scientific Journal
Zeszyty Naukowe

Academic Quarterly Publication
Vol 26, No 4 (2022)

Bielsko-Biala 2022

Scientific Journal of Bielsko-Biala School of Finance and Law

The Journal is published by Bielsko-Biala School of Finance and Law; ISSN 2543-9103, eISSN 2543-411X.

The Journal is a quarterly publication with the scoring of 70 assigned by the Polish Ministry of Education and Science, prompting quality scientific work with local and global impacts, conducting a peer-review evaluation process and providing immediate open access to its content. The publication features original research papers as well as review articles in all areas of science, with particular emphasis on social sciences (including Finance, Economics, Business, Law, Internal Security) and technical sciences (especially IT).

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Bielsko-Biala School of Finance and Law University Press
ul. Tańskiego 5, 43-382 Bielsko-Biała;
tel. +48 33 829 72 42, fax. +48 33 829 72 21; <http://www.wsfip.edu.pl>; <http://asej.eu>

ISSN 2543 – 9103 eISSN 2543-411X

December – 2022

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Editorial Words

Dear esteemed readers,

It is my great pleasure to welcome you to the latest edition of ASEJ, the academic journal that brings you the latest research in the fields of law, economics, logistics, finance, psychology, criminology, computer science, and security. This issue features a diverse range of articles from leading experts in these fields, showcasing their latest research and insights into current trends and challenges.

As we continue to face unprecedented challenges and rapidly evolving technological advancements, it is more important than ever to stay up-to-date with the latest research and trends in these fields. This issue of ASEJ offers valuable insights and perspectives that are essential for anyone seeking to stay at the forefront of their respective disciplines.

We would like to take this opportunity to express our sincere gratitude to the authors for their hard work and contributions to the advancement of knowledge. We would also like to acknowledge the invaluable support of the Bielsko-Biala School of Finance and Law for their continued commitment to publishing this journal, which serves as a platform for the exchange of the latest knowledge and insights.

Virtual reality (VR) technology has been advancing at a rapid pace, and with its growth come a range of challenges in various fields, including economics, law, security, and computer science. In the realm of economics, one challenge is determining how to integrate VR technology into existing business models. VR has the potential to revolutionize the way companies conduct business, but it also requires significant investment and infrastructure to do so. Additionally, there are concerns about how VR will impact the job market, as it could potentially eliminate the need for certain types of jobs while creating new ones in the VR industry.

In this issue, we also explore the growing significance of virtual reality in law, economics, finance, and security. As VR technology continues to evolve, it presents both opportunities and challenges in these fields. For example, in economics, VR has the potential to revolutionize the way businesses operate, but it also requires significant investment and infrastructure. In law, the use of VR raises important questions around data protection, privacy, and intellectual property rights. In finance, VR can be used to enhance customer experiences and provide new insights into investment opportunities. In security, VR presents new risks and challenges, such as ensuring the safety of users and protecting sensitive data from cyber threats.

We hope that this issue of ASEJ will prove insightful and informative for our readers, and we look forward to your feedback and contributions in future editions.

Sincerely,

Dr Muhammad Jammal
Editor of the ASEJ, Issue 4, Volume 26, 2022

Criminological aspect of suicide in Poland in the period 2014-2019

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Abstract— The paper discusses and analyses the criminological aspect of suicide in Poland in the period of 2014-2019. The first part of the paper introduces classification of suicidal behaviour and terminology related to auto-aggression and self-harm acts. On the basis of statistical data provided by the Polish Police Headquarters, the authors present and analyse the structure and dynamics of completed and attempted suicides in the studied period and show the scale of the phenomenon and its development tendencies. In the second part of the paper, the authors provide a criminological classification of violent death due to its cause. Based on the literature of the subject, the authors then make an analysis of selected deadly methods which by definition are the consequence of the suicidal decision or the consequence of a murder disguised as suicide or simply, consequences of an unfortunate accident. The paper culminates with the analysis of the phenomenon of suicide in Poland based on the Police statistics with respect to the effectiveness of methods used in order to take one's own life. In the ratio of suicidal deaths to suicide attempts the authors determine the methods which trigger the highest percentage of deaths i.e. the methods with higher level of aggression or higher determination of the suicidal individual. It is also observed that the Police list of suicide methods features new additions.

Keywords— suicide, criminology, death, statistics introduction.

I. INTRODUCTION

The statistical data obtained from the Police show the number of suicides and point to the scale of the phenomenon. It is hard to resist the temptation that the suicide rate, although subject to fluctuation, is a constant phenomenon which is very complex and impossible to eliminate from the society. In order to arrive at a reliable understanding of the phenomenon of suicide and its current developmental tendencies, it is necessary to conduct detailed analysis of the structure and dynamics of auto-aggression acts and to include the criminological aspect in the whole study. The law enforcement who carries out preparatory proceedings in cases of violent deaths plays a vital part in gathering available methods and means in order to

recreate what really happened – a suicide, a homicide or maybe just an unfortunate accident. Each suicide or suspected suicide incident requires the application of different detection methods and means but most of all requires extensive knowledge from the field of criminology and forensics. Statistics show that people are coming up with more and more new ideas how to kill themselves and are improving the existing methods. This in turn means that the law enforcement must keep up with the new trends and develop up to date techniques for detection of crime be it suicide itself, simulated suicide or masked suicide.

II. STRUCTURE AND DYNAMICS OF AUTO-AGGRESSION IN POLAND IN THE PERIOD 2014-2019

Relevant literature quotes a number of equivalent terms for the notion of auto-aggression: auto-destruction, auto-destructivity, self-harm (Makara-Studzińska, 2015, p.1). Auto-aggression according to A. Suchańska is 'a type of behaviour which directly or indirectly threatens the health or life of a person who undertakes the behaviour voluntarily and intentionally'. It is an intended procedure which does not rule out the certainty of survival (Boćwińska-Kiluk, 2017, p.119). In psychology, the act aimed at inflicting pain and injury upon oneself but deprived of a genuine suicidal intentions is called non suicidal self-injury (NSSI) (Michalska, Michalski, 2020, p.62). A self-injury act is frequently triggered by the willingness to release the tension and alleviate mental suffering (Makara-Studzińska, 2015, p.4) but is usually accompanied by self-preservation instinct and active protective mechanisms hence, the risk of life loss due to self-harm attempts is very low. This is what differentiates a self-injury act as a phenomenon motivated by positive intentions from totally negative suicidal behaviours (Kubacka-Jasiecka, 2006, p.154).

The most extreme form of auto-aggressive behaviour is the act of suicide which is classified together with suicide attempts or self-harm as a direct auto-destructive activity taken



intentionally to visibly and instantaneously cause damage to the body. In the same classification, but at the opposite pole, one may find indirect acts which are not aimed at harming oneself, even more, which bring specific benefits to the individual, but which in the longer term bring considerable damage to the health of this person. These are acts like taking psychoactive substances and undertaking risky activities (Boćwińska-Kiluk, 2017, p.121). Nevertheless, the present paper focuses solely on the direct auto-aggressive types of behavior and their analysis with respect to their structure and dynamics in the period of 2014-2019.

Polish researcher B. Hołyst sees the suicide phenomenon as a process which sometimes lasts years. The process starts as an idea in the mind of an individual and develops into a desired destination. B. Hołyst calls the process 'suicidal behaviour' (Hołyst, 2001, p.619) and makes a division of all suicide incidents with respect to the final effect into attempted and completed. Attempted suicide is when the attack on one's own life does not result in death. When the attack terminates one's life then it is a completed suicide. Another division B. Hołyst makes is into imagined suicide and desired suicide. These two types precede the attempted or completed suicide and by creating a chain of events give sense to the whole idea of suicide. Imagined suicide is when an individual starts to perceive death (not necessarily suicidal death) as the only possible solution to their problems, while the desired suicide is the next level in which the individual imagines own self-annihilation as the much welcome goal (Bąbik, Olejniczak, 2014, p.101).

The basic classification criterion used in studies on suicide is the end result of the undertaken suicide because thanks to this criterion it is possible to determine the volume of suicides which ended with death of the individual i.e., completed suicides, and attempted suicides which did not lead to the loss of life (Hołyst, 1983, p.130). From the examination of the scale of the phenomenon based on statistical data provided by the Police Headquarters, one may infer that the information on the number of attempted suicides is unreliable since it is not possible to register and file each and every suicide attempt. For sure, the data obtained do not reflect the actual scale of the problem (Zajac, 2012, p.243).

Table 1 features the numbers of registered incidents of suicide in the period 2014–2019 according to the criterion of completed and attempted suicides. The statistical data of the Police show that in the examined period 31,337 individuals attempted but failed to take their own life, while 32,971 individuals successfully took their own life. Between 2014 and 2019, the highest number of completed suicides was recorded in 2014 (6,165 deaths), and the smallest number in 2018 (5,182 deaths). Statistical registration made it possible to isolate the numbers of attempted suicides in the period under examination with the highest number of failed suicides in 2019 (6,706 attempts) and the smallest number in 2014 (4,042 attempts). In 2019, which is the final year of the study, the number of completed suicides fell by 14,76%, and the number of attempted suicides rose by 65,91% when compared to 2014. Statistics regarding the number of people attempting to

take their own life in the period 2014-2019 versus the number of completed suicides (deaths) and the percentage of deaths in the total number of suicide attempts is presented in Table 2.

TABLE 1. NUMBER OF ATTEMPTED AND COMPLETED SUICIDES IN POLAND IN THE PERIOD 2014-2019.

Year	Number of suicides	
	Not resulting in death (attempted suicide)	Resulting in death (completed suicide)
2014	4 042	6 165
2015	4 285	5 688
2016	4 456	5 405
2017	5 863	5 276
2018	5 985	5 182
2019	6 706	5 255
Total	31 337	32 971

Source: Own work based on statistical data from the Polish Police Headquarters.

TABLE 2. NUMBER OF ATTEMPTED AND COMPLETED SUICIDES AND THE PERCENTAGE OF EFFICIENCY OF SUICIDE ATTEMPTS IN THE PERIOD 2014-2019.

Year	Number of suicides attempts	Number of deaths	% of deaths
2014	10 207	6 165	60,40
2015	9 973	5 688	57,03
2016	9 861	5 405	54,81
2017	11 139	5 276	47,37
2018	11 167	5 182	46,40
2019	11 961	5 255	43,93
Total	64 308	32 971	51,27

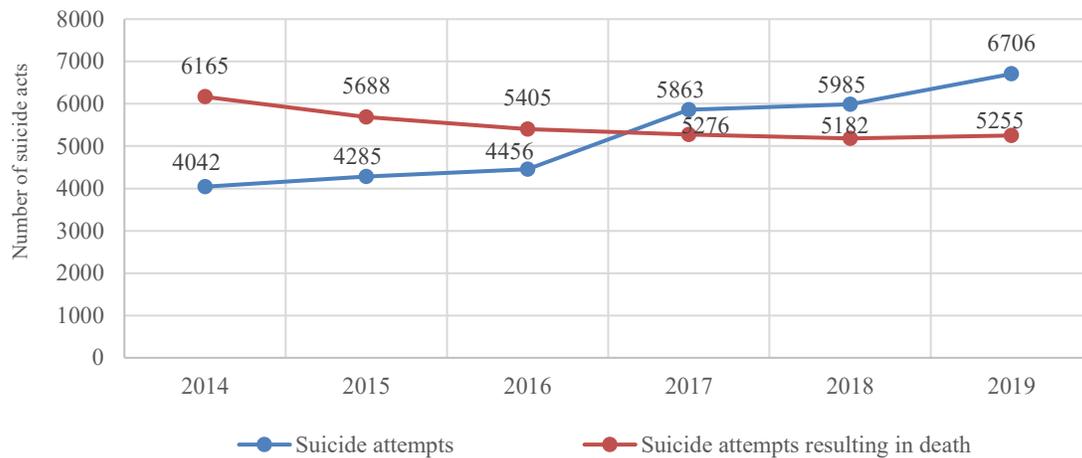
Source: Own work based on statistical data from the Polish Police Headquarters.

Within the examined six-year period, 64,308 people attempted to kill themselves while 32,971 people died as the result of the suicide attempt. The percentage of completed attempts versus the total number of attempts in the studied period reached the level of 51,27%. In 2014 the ratio of deaths to the number of attempts was 60,40%. In the years that followed the ratio gradually decreased reaching 43,93% in 2019. At this point it should be observed that the ratio of deaths to suicide attempts fell in consecutive years and between 2014 and 2019 a difference of 16,47% can be observed. It must not go unnoticed however, that the total number of suicide attempts was going up year after year in the studied period. The data presented in Table 2 show that 2019 was the year with the highest number of suicide attempts (11,961 people), while 2016 was the year with smallest number (9,861 people).

The dynamics of attempted and completed suicide acts in the period of 2014–2019 is presented in Chart 1.

Chart 1 presents in a graphic way the data from Table 1. What can be noticed here is a gradual fall of the number of suicidal deaths throughout the studied period with concurrent, though irregular, growth of attempted but failed suicide acts. The year 2019 shows a slight increase in deaths as the result of suicide amounting to 5,255 completed suicides with constant upward tendency of suicide attempts. This sudden upward trend of failed suicide attempts in the studied period reaches the peak in 2017 then slows down in the next year to accelerate to the highest number of 6,706 of suicide attempts in the final year of the study.

CHART 1. DYNAMICS OF ATTEMPTED AND COMPLETED SUICIDES IN POLAND BETWEEN 2014 AND 2019.



Source: Own work based on statistical data from the Polish Police Headquarters.

III. CRIMINOLOGICAL ASPECT OF SUICIDE

Investigative activities carried out at the site of the body discovery, forensic medical autopsy, securing traces and gathering evidence which are conducted in order to reconstruct the course of events, are aimed at determining the cause and circumstances of the violent death of a person. The above procedures, expertise as well as operational and procedural activities are also applicable in suicide cases (Bednarski, Urbanek, 2012, p.9). It should be pointed out that violent death in forensic medicine is defined as any death caused by external factors that lead to the impairment of vital functions of organs. The classification of violent death includes loss of life caused by an unfortunate accident, suicide or homicide (Bednarski, Urbanek, 2012, p.17). In the event of a violent death, it is essential for the law enforcement to determine, in the course of operational and procedural activities, whether the fatal injuries were inflicted by the deceased himself or herself, were they dealings of a third party or were they a consequence of an accident (Gawliński, 2017, p.100).

Sometimes the true nature of the event is hidden. It may happen that the killer, in order to conceal his/her criminal activity and thwart the investigation, creates such accompanying circumstances so that the event looks like a suicide or an accident. The nature of such an event in the literature is called a 'simulated suicide' (Gawliński, 2017, p.157). Deliberate alteration of the crime scene, including the position of the corpse, aimed at misleading law enforcement authorities, is defined differently by authors, but always falls under the common term 'staging'. Misleading law enforcement is usually motivated by the perpetrator's desire to divert the investigation to someone other than the most logical suspect but it can also be motivated by a desire to protect the reputation of the family of the victim, for example, by simulating suicide by removing pornographic content from the scene of autoerotic death (Bruinsma, Weisburg, 2014, p.832). Not all authors, however, agree on the use of the definition of staging in cases

of unconscious actions of third parties e.g., covering the corpse of a close person. Some authors insist that the person who committed staging must have intended to divert the investigation on the wrong track, while the action could have been purely intuitive and motivated by the desire to protect a family member from shame (Pachura, 2021, p.21). Changing the appearance of the suicide scene may also be a deliberate act of the person who committed suicide or of third parties who, for various reasons, stage suicide as an accident or a criminal act (Pachura, 2021, p.419). A situation in which the act of suicide is made to look like an accident or homicide is called masking (Gawliński, 2017, p.157).

All cases described above have common features of covering-up of what really happened. J. Domaniewska and B. Sygit write about the construction of false evidence committed 'in order to suggest that a given event is of a criminal nature of a certain type or is of a non-criminal nature' (Pachura, 2021, p.23). Therefore, taking into account the multitude of possible circumstances surrounding the event, including the possibility of covering up activities, while inspecting the scene of violent death, it is important to take a careful and reliable approach aimed at detecting whether the event occurred as a result of suicide, homicide or was it an accident (Pachura, 2021, p.100). However, it will be of primary importance to determine whether the place where the body was discovered had been the actual place where the incident had happened. In the case of homicide, the victim could have been moved from the crime scene to another place and the corpse was placed in a position that could indicate a different circumstance of death than the actual one. Also, in an event of a suicide, the person after inflicting fatal wounds upon himself/herself may have been able to move several meters before losing consciousness (Gałęska-Śliwka, 2009, p.89).

In case of suicide, it is crucial to determine the reason why the deceased took his/her own life. Discovery of the intention behind suicide is usually made in the course of interrogating the relatives of the deceased, during the analysis of documents belonging to the deceased or the examination of the suicide note

left by the deceased (Hołyst, 2012, p.870).

Determination of the circumstances accompanying a fatal accident, including the exclusion of the involvement of third parties during examination of the corpse at the scene is also of great importance (Gawliński, 2017, p.101). Determining whether the victim managed to inflict such wounds on himself/herself is just as relevant. (Gałęska-Śliwka, 2009, p.87). The assessment of injuries on the body of the deceased makes it possible to substantiate or question the assumed version of the events.

In the next part of the paper, the authors present selected methods of taking one's own life based on the available literature, in the context of difficulties to ascertain whether the cause of death was actually suicide (Gawliński, 2017, p.101).

A. Strangling

Strangling occurs as a result of mechanical pressure exerted on the neck. Literature states that strangling can occur as a result of hanging, strangulation, and suffocation (Gawliński, 2017, p.106). Individual cases of death by strangling are described in the subsections listed below.

B. Hanging

The most common method of suicide in Poland is death by hanging (Hołyst, 2012, p.893). It occurs as a result of the person being deprived of oxygen by tightening the blood vessels on the neck by a loop, thus closing off the oxygenated blood flow to the brain (Kaczorowska, Draber-Mońko, 2014, p.134). The force of the body's weight acts as the clamp of the loop. The tightening of the loop can crush or break the trachea or dislocate the base of the tongue, which is the direct cause of strangulation (Nuland, 1996, p.188). As a result of mechanical pressure on the carotid artery, loss of consciousness occurs in a very short time, and if no help is provided in timely manner, the event results in death (Hołyst, 2012, p.893). Losing consciousness means that a person cannot change their decision to die because without the participation of third parties, they are unable to save themselves. The fact that only a few kilograms of pressure on the loop is enough to tighten it around the neck, causing the effect intended for the suicide is dramatic. In addition, this effect can be achieved in any position chosen by the person who wants to commit suicide, it also works when the person is sitting or kneeling (Gawliński, 2017, p.107).

For medical and judicial decisions, it is important to determine the nature of the event and to answer the question whether in each case of suicide by hanging, the investigating authorities are dealing with a real suicide or with a homicide disguised as a suicide by hanging. However, according to B. Hołyst, law enforcement agencies deal with this complexity relatively rarely (Hołyst, 2012, p.893). Hanging most often occurs as a result of an act of self-aggression. Accidental deaths by hanging are also rather rare (Gawliński, 2018, p.71).

Nevertheless, among the cases of masked homicide, two methods of simulating suicide by hanging are mentioned in the literature - homicide by hanging and hanging the corpse of the victim who was previously murdered. Difficulties in classifying the nature of the event are related to the first mentioned method

of murder, because the groove on the neck of the person murdered in that way is identical to that occurring as a result of suicide hanging - a single ascending groove is present here (Hołyst, 2012, p. 894). Although the occurrence of two grooves does not clearly indicate the involvement of a third party, it may be the result of a previous suicide attempt or occur because of convulsive movements, as a result of which the location of the loop is shifted (Hołyst, 2012, p. 900). When it comes to the second method, changes on the corpse indicating previous bodily injury or changes revealed at the scene of the event are of key importance for determining the circumstances of the event (Hołyst, 2012, p.897).

C. Strangulation

While the factor of auto-aggression is present in hanging, strangulation is usually associated with the participation of a third party. It is one of the mechanisms of violent strangulation, which occurs as a result of tightening the noose around the neck, usually with the use of strength of hands or with the use of a tourniquet, hence, although this type of strangulation does not exclude the possibility of suicide, it is usually a criminal act. In the case of suicide, the groove is usually found on one level and is located lower on the neck, while the involvement of a third party may be indicated by a groove occurring at different levels (Hołyst, 2012, p. 905). Nevertheless, B. Hołyst points to some difficulties in determining which of the following methods of strangulation the cause of death was when the victim was first strangled and then hanged (Hołyst, 2012, p. 909).

D. Suffocation

According to A. Gawliński, the loss of life caused by suffocation leaves no doubt as to the circumstances of the fatal outcome. Suffocation, as the author points out, can only occur as a result of the action of a third party, by putting pressure on the victim's neck to cause a lethal effect, most often with the use of the hand, but it is possible to use the leg or knee for this purpose. It should be noted that the chances of taking one's life by suffocation are close to zero, as the pressure on the neck caused by one's own hand releases because of loss of consciousness, and the person who fainted soon regains consciousness (Gawliński, 2017, p.113). A. Gałęska-Śliwka, however, points to some rare cases of suffocation resulting from an accident (Gałęska-Śliwka, 2009, p. 93). Such unintentional events include e.g., suffocation by closure of the trachea caused by a stuck piece of food. Often, the accompanying circumstance of such event is previously consumed alcohol (Nuland, 1996, p. 188).

E. Jumping from high altitudes

Statistically, the second most common way of taking one's own life in Poland is jumping/falling. Suicide by jumping from high altitude causes extensive injuries, thus this method is very effective (Gawliński, 2017, pp. 113-114). It should be noted that in case of a fall, it is difficult to determine the nature of injuries. However, the literature mentions some specific features of injuries resulting from the fall from height, the analysis of which allows to determine the method of falling. This, in turn, together with the analysis of the place of the event,

contributes to the credibility of a given forensic version (Hołyst, 2012, pp. 950-951). A fall from high altitude may be an intentional act of a person who wants to commit suicide, it may also be an unfortunate accident, or may be criminal in nature if a perpetrator deliberately pushed or threw the victim. However, G. Teresiński notes that criminal cases of such nature are extremely rare (Teresiński, 2019b, p.789; Teresiński, 2019a, p.810). Differentiation of events due to the above criteria requires, among others, specialist medical training and basic knowledge of kinetics (Teresiński et al., 2019, p.796).

A thorough examination of the site of a fall from high altitude and careful examination of the corpse, may provide important information on the probable course of events. Suicidal people usually choose places where the trajectory of the fall will not be disturbed by various types of obstacles (Hołyst, 2012, p.950). It is indicated that in the case of suicide, the flight path of the body never follows a straight line, thus the place where the corpse is found is usually away from the line horizontal to the place from which the person fell. In practice, this means the location of the body is away from, for example, the wall of the building from which the jump took place and this distance is justified by a deliberate detachment of legs of the suicidal person from the ground in the course of the jump (Gawliński, 2017, p.115). It is believed that when an accident occurs or when the victim is thrown out of the window, the body falls close to the wall (Hołyst, 2012, p.950). However, it is important to bear in mind that in practice there is a wide spectrum of ways to initiate a fall aimed at taking one's own life, for example, taking a step forward, tipping the body over the edge, going over a protective barrier or jumping with or without a run up. These methods have a significant impact on both the trajectory and range of the fall but also on the position of the body relative to the line horizontal to the place where the fall began (Teresiński et al., 2019, p.796). In addition, in the case of a fall from high altitude, the location of the corpse changes in relation to the original place where the body hit the ground because the body bounces back from the ground. There are cases described in the literature in which bodies were lying more than 2 m away from the original point of contact with the ground, where the height of the fall was estimated as being the equivalent of several floors (Teresiński et al., 2019, p.801).

One of the most crucial points in the assessment of the cause of the event is to determine whether the victim was conscious at the time of the fall. An indication of a maintained consciousness of a falling person are their defensive reflexes aimed at preventing the fall or minimizing potential injuries suffered as a result of hitting the ground. An attempt of a falling person to 'cling on' to protruding objects leaves marks in the form of traces of dirt on the inner surface of the hand and the forearm bone may be broken (Gawliński, 2017, p.115). On the other hand, the body of a person who had lost consciousness before falling falls passively, without defensive reactions.

There is a possibility that the fall could have been the result of a criminal act committed on the victim who was either conscious or unconscious. However, the above analysis criterion provides valuable clues in determining the possible course of the event, and to a large extent it is a valuable clue in

the event of a suspicion that an unconscious person was thrown (e.g., from a window) (Hołyst, 2012, p.951). In the case of a deliberate act of the perpetrator, there may be damage on the body suggesting the use of violence against the victim prior to the fall. As a result of applying overpowering force to the victim, he/she lost any defensive capabilities. The most common way to subdue a victim is to cause blunt trauma to the head, however, in terms of traces indicating the use of overpowering force, the victim's body is also searched for, among others, injuries that indicate an attempt to choke the victim, signs of twisting or binding the feet or hands or other marks on the body of the deceased that cannot be related to the fall (Teresiński, 2019a, p.810).

F. Gunshot

Very limited access to firearms in Poland undoubtedly contributes to the fact that suicide by shooting is not common. However, the use of firearms is a method of killing with a high degree of probability of criminal behaviour of third parties. In cases of death with the use of firearms, the possibility of an accident is also taken into account (Hołyst, 1983, p. 201). Accidents may occur as the result of improper handling of weapons (Gawliński, 2017, p.128).

The distance at which a suicide shot is fired is generally very short. A shot from a firearm, usually fired by the victim in the temple or open mouth, leaves a trace in the form of sooting in the vicinity of the bullet entry point – the closer the shot is fired, the more intense the trace is, and the scope of the sooting field decreases (Hołyst, 1983, p.201). A close-up shot can also be concluded on the basis of the traces found at the muzzle of the barrel, as well as traces in the form of micro-traces of blood and the victim's tissues on the body of the person firing the weapon and parts of their clothes. Studying residues left on the body or clothing after firing ammunition from firearms: GSR particles (short for *gunshot residue*) is of great importance (Bednarski, Urbanek, 2012, pp.47-48). GSR marks remain on the offender's hands for approximately eight hours if the offender does not clean his/her hands. Washing hands or excessive sweating results in a 10-20% decrease in the detection of the substances. GSR substances last much longer on clothing. Their detection on clothes is possible up to 24 hours after firing the shot. Weapon usage also leaves traces on the trajectory of the projectile. All of the above basically allows to reconstruct the course of events. While in a closed room the location of the revealed casings is not of great importance, because the location of the casings may result from them bouncing back from objects, in the open space the analysis of the casings arrangement may constitute a valuable clue (Gałęska-Śliwka, 2009, pp. 97-99). The process of deduction based on the examination of the shooting distance is essential in determining the circumstances of fatal shooting.

Dactyloscopic examination of the smooth parts of the weapon in order to reveal the fingerprints left by the person who committed suicide is just as important (Bednarski, Urbanek, 2012, p.47). However, in the aftermath of a staged suicide, it is possible that the killer's fingerprints may be intentionally removed. The perpetrator may also deliberately imprint the

victim's fingerprints by placing a previously used firearm in the victim's hand. Finding a firearm in the deceased's hand can provide a valuable clue. This should arouse suspicion of the law enforcement authorities of the criminal nature of the event because as a result of the loss of consciousness the muscles relax, which causes the previously held weapon to fall out of the victim's hand at the moment of death (Gawliński, 2017, p.130). Thorough inspection of the scene of the event allows to draw conclusions about a given forensic version and to reconstruct what really happened.

G. Drowning

Cases of suicide by drowning are very rare, which is emphasized by various authors of publications on the subject of suicide. The rarity of this suicide method is undoubtedly due to the significant degree of pain that is associated with this type of death. Death by drowning occurs only after around 4-6 minutes in the case of a conscious person. Lack of consciousness extends this time to 8 minutes (Gawliński, 2017, p.133). E. Pachura draws attention to the instinct of staying alive which awakes in a person in a situation of imminent threat to life, regardless of the original will to die. As the author points out, in a situation where a person lacks access to oxygen, the survival instinct is triggered and causes the suicidal person to refrain from suicidal actions and to seek to provide life-giving oxygen to the lungs as soon as possible (Pachura, 2021, p.333). By looking at the statistics, the authors of relevant studies indicate that the most common cause of drowning is an unfortunate accident (Pachura, 2021, p.333).

When it comes to drowning, there are five basic forensic versions: death by natural causes, throwing a dead body into water, drowning caused by an accident, suicide and homicide by drowning the victim (Pachura, 2021, p.334). If a person commits suicide, they deliberately inhale water into their lungs. When drowning is an accident, the victim tries to hold their breath so that they have enough oxygen to fight for life for as long as possible but this causes too much carbon dioxide in the victim's blood, leading to hypercapnia (Nuland, 1996, p.189).

Throwing a corpse into the water can be considered a homicide staged as drowning. Such a criminal act is characterized by the fact that the body is devoid of certain features characteristic of death by drowning found during autopsy e.g., emphysema, although, as it is noted, not all of these features must be present, and even none of them (Pachura, 2021, p.335). In the case of homicide, chemical testing of water from the lungs for salts and contaminants makes it possible to detect the actual place of drowning the victim e.g., in a bathtub, and then to establish whether the body had been transported and dumped into another water reservoir, where it was later found (Pachura, 2021, pp.334-335).

The body of a drowned person, being heavier than water, sinks to the bottom with the heaviest part of the body down (i.e. the head). Only when the putrefactive processes cause the tissues to distend, filling them with gas, the body floats to the surface. It happens within a few days or a few weeks. The duration of this process is affected by the temperature of the water and its level (Nuland, 1996, p.190). The basis upon which

a given criminal scenario is adopted are traces of injuries on the corpse taken out of the water inflicted while the person was still alive, which indicates a fight with the attacker or an attempt to defend oneself against being thrown into the water. However, such injuries are only inflicted if the victim has time to react defensively. (Hołyst, 1983, p.211; Gawliński, 2017, p.136). It cannot be ruled out that injuries inflicted while the person was still alive may have been caused by an accident- falling into the water or by something that had happened immediately before the suicidal act, i.e., hitting the elements of a bridge while jumping (Konopka, 2019, p. 844). Therefore, it is vital for the medical examiners to distinguish between the causes of injuries sustained while the person was still alive, and from those inflicted post-mortem, resulting from, for example, the current of a river or the position of the corpse in the water i.e. with the head facing forward (Hołyst, 1983, p. 212; Konopka, 2019, p. 844). Since the head is one of the most vulnerable parts of the body in water, abrasions of varying severity, numerous head injuries and sometimes even deep wounds are usually observed (Konopka, 2019, p. 844). The most difficult scenario is undoubtedly the situation in which no injuries were inflicted while the person was still alive. This situation raises doubts as to whether the person drowned intentionally, accidentally drowned, or was pushed in the water by a third party (Pachura, 2021, p.337).

Determination of the circumstances leading to the discovery of the cause of drowning is not limited to autopsy. Deduction on the basis of other available information provided by the scene of the event allows for the creation and elimination of individual forensic versions. The nature of the event may also be indicated by circumstances that, through logical deduction, will allow the assumption of a given version of the event. It does not seem reasonable for a person who wants to commit suicide by drowning to put on a bathing suit beforehand (Gawliński, 2017, p.135)

H. Self-immolation

The method of taking one's own life by self-immolation is not common in Poland. This method was not recorded in the Police statistics before 2017. A. Gawliński points out that self-immolation is usually a form of protest, a demonstration. Through the act of self-immolation, a person committing suicide wants to focus attention on a given problem in the field of politics or religion (Gawliński, 2018, p.104).

As in any other case of violent death, every effort should be made to determine the actual nature of the event, as the circumstances and evidence collected at the scene of the event may indicate an unfortunate accident, a suicide, or a criminal act by third parties. If the hypothesis of homicide disguised by the perpetrator by setting the victim on fire is accepted, the judicial body orders an examination of the corpse, during which special attention is paid to various types of bodily injuries that may indicate signs of a fight with the perpetrator. Medical investigators, however, have to distinguish between bodily injuries caused while the person was still alive from changes that occurred to the body since the moment of death. When the body burns, high temperature makes the skull cracks in the area

of the cranial vault, which can be confused with the mechanical damage of the skull caused by a blunt instrument in the hands of a perpetrator, while high temperature does not cause fractures of the skull at its base. To determine the circumstances of the event, the distribution of burns on the body is also taken into account, as they indicate the position in which the victim was at the time of burning (Hołyst, 2012, p. 965).

B. Hołyst quotes an example of a suicide, which undoubtedly caused difficulties due to its complexity. It is a case of self-immolation of a student from Krakow. During the examination, a knife stuck in the chest of the partially charred corpse was revealed, however, the results of the investigation did not indicate any criminal activity of third parties. This case, nevertheless, falls within the type of a complex suicide described later in the paper, where the use of the second method of suicide by stabbing oneself with a knife was presumed to be motivated by the desire to relieve one's suffering during prolonged burning (Hołyst, 2012, p. 962).

IV. THE PHENOMENON OF SUICIDE IN THE LIGHT OF STATISTICS IN THE PERIOD 2014-2019

Sylvie Plath, a talented American writer and poet who killed herself by gas poisoning, a year before her death wrote a poem *Edge* - one of her most beautiful literary works. The poem begins with the following words: *The woman is perfected. Her dead body wears the smile of accomplishment* (Ringel, 1987, p. 286). R.A. Heckler, a psychologist, interviewed people who tried to take their life. In his book *Waking up, alive*, he presents the point of view of a person in a pre-suicidal state. Such person, while looking out of the window facing the river, marvels at the night scenery, feeling soothed and achieving peace of mind. Under such conditions, he/she concludes that it is a beautiful night to die. Then, their mind creates scenarios of suicide which are saved in their memory as images (Joiner, 2007, p.87). The author speculates that for people who decide to enter the path towards suicide, death is not ugly, it is a beautiful experience (Joiner, 2007, p.90). Suicidal individuals see death in a very specific light, they describe it as beautiful and graceful (Joiner, 2007, p.132). It is possible that the unique perspective from which suicidal persons perceive the desired death may be decisive in the choice of the place and method of taking their own life. For example, it is a well-known fact that people are more likely to choose the Golden Gate Bridge, generally recognized as aesthetic and beautiful, to commit suicide rather than the Bay Bridge which is located very near but is much less attractive (Joiner, 2007, p.88).

The method of committing suicide is undoubtedly influenced by the level of aggression of the suicidal person. The aggression level is manifested in the degree of bodily harm for which the

individual is prepared. Taking the above as a starting point, B. Hołyst classifies the methods of taking one's own life according to the degree to which bodily integrity is violated during a suicide attempt. During such act, external factors will impact the shape of the body and cause changes in the appearance of its external parts (Hołyst, 2012, p.888). But in some cases e.g., poisoning, changes in the appearance of the body basically do not occur.

When analyzing the determinants behind the choice of the method of death by suicide, one should not overlook the fact that methods of suicide are distinguished not only by the degree of aggression, but also by the degree of effectiveness. Therefore, the choice of a suicide method may depend on the goal assumed by the suicidal person and the expected result. Hanging and drowning have the highest degree of effectiveness, while ingestion of sleeping pills has the lowest effectiveness (Hołyst, 2012, p.890). People who are really determined to take their own life are more likely to choose methods that will bring the expected result in the form of a sudden death.

Usually, people who want to take their own life choose a method which they think is reliable. However, sometimes the selected method fails and if the person is still driven by a strong motivation to take his or her life, he or she may reach for another method. The literature calls this type of suicide combined or complex suicide. It involves the use of more than one method of taking one's own life (Gawliński, 2017, p.149). This form of suicide can be planned and prepared in advance, and its execution may involve the simultaneous use of both methods (Gawliński, 2017, p.151). Police practice shows that in most cases of combined suicide it all starts with mechanical damage to the body then progresses to more radical methods mainly hanging (Hołyst, 2012, p.891).

In the next part, the paper presents statistical data collected by the Polish Police Headquarters regarding popular methods of suicide between 2014 and 2019 (Table 3), and efficiency of particular methods (Table 4). The ratio of the total number of suicide attempts to successful suicides divided by the method is presented in Chart 2.

The period 2014 and 2019 clearly points to one dominant method of committing suicide, namely hanging. This method of suicide was chosen by 35,782 people throughout the period under consideration. This method prevails over other selected methods of suicide and amounts to 55.64% of all suicide attempts in the analyzed period. However, it should be noted that between 2014 and 2018, the downward trend in the choice of this method was observed year by year, with an exception of 2017 and 2019. In 2014, 6,582 people hanged themselves while in 2019 this method was chosen by 5,740 people. It may be concluded that in the period 2014 -2019 the popularity of death by hanging fell by 12.79%.

TABLE 3. METHODS OF SUICIDE ATTEMPTS IN POLAND BETWEEN 2014 AND 2019.

Method of suicide attempt	2014	2015	2016	2017	2018	2019	Total
Hanging	6 582	6 066	5 819	5 966	5 609	5 740	35 782
Self-mutilation	652	788	816	991	1 095	1 299	5 641
Jumping from high altitudes	856	877	798	934	911	912	5 288
Taking sleeping pills/psychotropic drugs	474	520	572	674	774	894	3 908
Other method	771	813	895	454	451	457	3 841

Method of suicide attempt	2014	2015	2016	2017	2018	2019	Total
Taking other drugs	.	.	.	959	1 061	1 289	3 309
Damage to the circulatory system	370	367	393	388	501	524	2 543
Jumping in front of a moving vehicle	184	207	216	241	222	275	1 345
Drowning	113	119	126	127	117	114	716
Shooting oneself/using a firearm	86	79	104	90	96	102	557
Gas/combustion fumes poisoning	67	85	73	92	104	114	535
Chemicals/toxic agents poisoning	52	52	49	62	68	89	372
Suffocation	.	.	.	89	84	93	266
Self-immolation	.	.	.	48	54	40	142
Intoxicants poisoning	.	.	.	21	17	19	57
Designer drugs poisoning	.	.	.	3	3	–	6
Total	10 207	9 973	9 861	11 139	11 167	11 961	64 308

Source: Own work based on statistical data from the Polish Police Headquarters.

According to the statistics of the Polish Police Headquarters, self-mutilation is the second most frequently chosen method of suicide between 2014 and 2019. Decision to attempt suicide using this method was made by 5,641 people, which constitutes 8.77% of all suicide attempts. The analysis of individual years indicates an upward trend in the choice of this method. The increase is visible in every single analyzed year without any exceptions. This method is also characterized by the largest increase (99.23%) among all the methods included in the statistics compared to 2014 and 2019.

Jumping from high altitudes was the suicide method chosen by 5,288 people, which makes it the third most frequent method of suicide in the analyzed period, making up 8.22% of all suicide attempts in the analyzed years. Among other methods of attempted suicides, in terms of their number in the years 2014-2019, the runners up are: taking sleeping pills or psychotropic drugs - 3,908 people attempting suicide by this method (6.08% of all attempts), an increase in the choice of this method between 2014 and 2019 by 88.61%. Further position is

taken by damage to the circulatory system - 2,543 cases, which is 3.95% of the total attempts.

As mentioned above, self-mutilation is a method with the largest increase of attempts in the studied period, another suicide method which has also gained popularity in recent years is poisoning with chemicals or toxic agents and poisoning with gas or combustion fumes, where the growth rate in 2019 compared to 2014 was 71.15% and 70.15%, respectively.

As of 2017, new methods of committing suicide have been included in the Police classification. In previous years the following methods did not meet the criteria subject to this classification but now they are on the list: poisoning with designer drugs (6 cases), poisoning with intoxicants (57 cases), self-immolation (142 cases) and suffocation (266 cases). All these cases were recorded in the three final years of the study (2017-2019). But the record-breaking method among the new additions is 'taking other drugs' with as many as 3,309 people attempting suicide in this way.

TABLE 4. EFFICIENCY OF VARIOUS METHODS OF SUICIDE (COMPLETED SUICIDES) IN POLAND BETWEEN 2014 AND 2019.

Method of suicide attempt	2014	2015	2016	2017	2018	2019	Total
Hanging	5 241	4 748	4 473	4 313	4 211	4 240	27 226
Self-mutilation	54	69	71	46	36	38	314
Jumping from high altitudes	373	361	344	342	330	330	2 080
Taking sleeping pills/psychotropic drugs	69	45	66	44	48	50	322
Other method	137	153	131	53	70	51	595
Taking other drugs	.	.	.	58	61	63	182
Damage to the circulatory system	53	62	51	75	83	96	420
Jumping in front of a moving vehicle	91	90	100	105	105	132	623
Drowning	52	51	65	57	46	45	316
Shooting oneself/using a firearm	63	53	70	72	79	86	423
Gas/combustion fumes poisoning	18	37	21	29	38	41	184
Chemicals/toxic agents poisoning	14	19	13	17	12	24	99
Suffocation	.	.	.	49	45	44	138
Self-immolation	.	.	.	12	15	11	38
Intoxicants poisoning	.	.	.	4	3	4	11
Designer drugs poisoning	.	.	.	–	–	–	–
Total	6 165	5 688	5 405	5 276	5 182	5 255	32 971

Source: Own work based on statistical data from the Polish Police Headquarters.

According to the statistics of the Polish Police Headquarters in 2014-2019, 27,226 cases of suicide by hanging were recorded in Poland, which is 82.58% of all successful suicide attempts. B. Hołyst states that death by hanging has long been the most popular form of suicide. He points to a research work

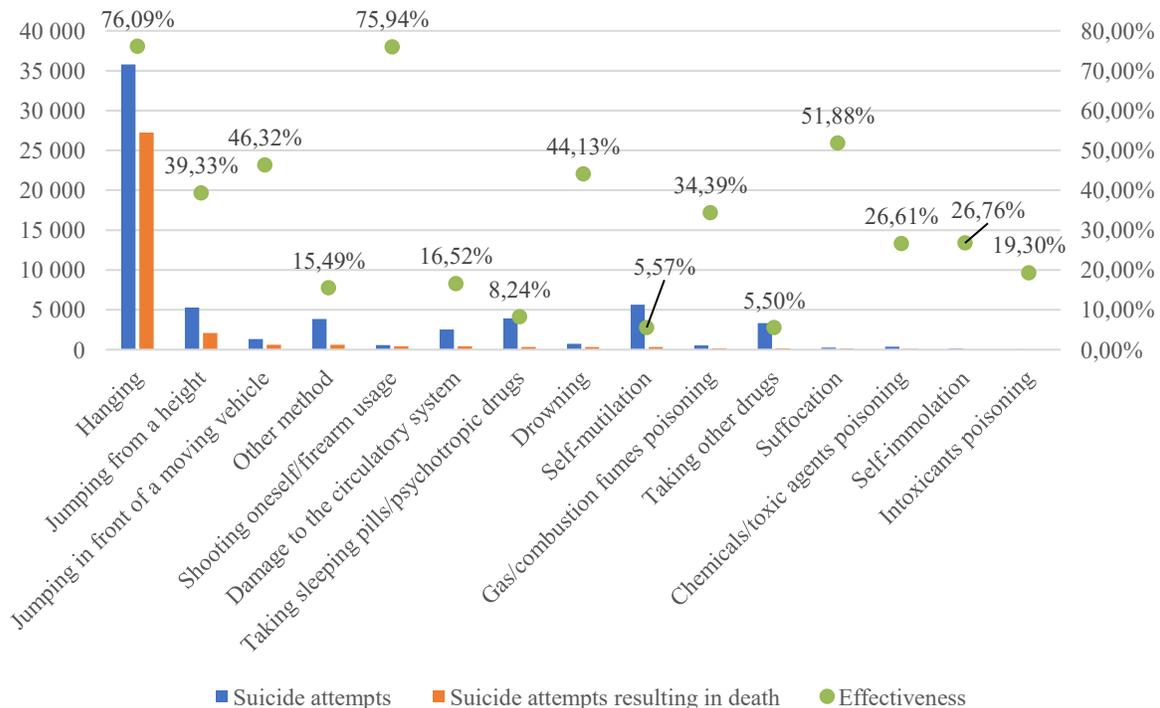
conducted in Kraków in 1940-1949 which confirms this thesis. However, back then, in the period 1881-1892, poisoning and shooting were the dominant methods of taking one's own life (Hołyst, 2012, p.878). Suicide by hanging is the most common and most effective way of taking one's own life in the years

studied but the use of this method clearly decreases yearly in the analyzed period. There were 1,001 fewer deaths by hanging in 2019 than in 2014, which means a statistical decrease in the number of suicides by this method by 19.10% in 2019 in comparison to 2014.

The second method with high probability of a completed suicide in the evaluated years is jumping from high altitudes. According to data provided by the Polish Police Headquarters, between 2014 and 2019, 2,080 deaths caused by suicide by jumping or falling were recorded. This method accounts for 6.31% of all successful suicide attempts in this period. The third most common method of suicide attempts resulting in death in the period between 2014 and 2019 is vehicular impact. In this way 623 people met their death, which is 1.89% of all suicide deaths in the analyzed years. 423 people committed suicide using firearm (1.28% of all suicide attempts ending in death), 420 people took their own lives by damaging the circulatory system (1.27% of the total suicide deaths), 322 people died by taking sleeping pills or psychotropic drugs (0.98% of the total number of completed suicides). Drowning, with the number of 316 deaths, accounted for 0.96% of all deaths by suicide in the analyzed period, and self-mutilation caused the death of 314 people, with an almost equally low rate of 0.95% of all suicide deaths in the analyzed years. The rarest methods of successful suicide attempts in individual years,

recorded in the statistics of the Polish Police Headquarters, are methods that have been known since 2017. These are, among others: poisoning with intoxicants resulting in death of 11 people in 2017-2019 (statistical average 3.67 deaths/year), self-immolation 38 people (12.67 deaths/year) and suffocation 138 people (46 deaths/year). On an annual basis, the average number of suicides by hanging in the years studied result in almost 4,538 deaths per year. The highest increase in the number of committed suicides in 2019 compared to 2014 was noted for: gas/combustion fumes poisoning, damage to the circulatory system and poisoning with chemicals/toxic agents, where the growth rates were: 127.78%, 81.13% and 71.43% respectively. At the same time, two methods i.e. self-mutilation and sleeping pills/psychotropic drugs noted the decrease at the respective levels of 29.63% and 27.54% in the period under examination. The structure of selected suicide methods which cause the highest number of deaths, presented in Chart 6 below, shows the ratio of suicide attempts to deaths resulting from suicide undertaken between 2014 and 2019. Although the predominant nature of both suicide attempts by hanging and deaths by hanging makes it impossible to accurately depict the structure of other methods, it can be noticed that almost every suicide attempt by firearm usage resulted in death, which is also an indicator of the degree of effectiveness of this method.

CHART 2. STRUCTURE OF SELECTED METHODS OF SUICIDE ATTEMPTS AND SUICIDE ATTEMPTS RESULTING IN DEATH CARRIED OUT IN POLAND AND THE EFFECTIVENESS OF SELECTED METHODS BETWEEN 2014 AND 2019.



Source: Own work based on statistical data from the Polish Police Headquarters.

Based on the statistical data of the Polish Police Headquarters (see Table 3 and Table 4), the percentage of suicide attempts resulting in death was calculated in relation to the suicide attempts committed by various suicide methods

between 2014 and 2019. Using this indicator, which is also presented in Chart 6, it is noted that in terms of the effectiveness of suicide attempts, the following methods were the most effective in the analyzed years: hanging - 76.09%, shooting

with a firearm - 75.94%, and suffocation - 51.88%. Suicide by vehicular impact caused death in the case of 46.32% attempts, similarly drowning - 44.13%, jumping/falling - 39.33%, gas/combustion fumes poisoning- 34.39%, self-immolation - 26.76%, poisoning with chemical/toxic agents - 26.61%, poisoning with intoxicants - 19.30%, damage to the circulatory system - 16.52%, the remaining methods resulted in death in the case of 15.49% suicide attempts. The lowest percentage of deaths versus suicide attempts was observed for: taking other drugs – death in 5.50% of attempts, self-mutilation - 5.57 and taking sleeping pills/psychotropic drugs - 8.24%. When it comes to suicide attempts by poisoning with designer drugs, no deaths were recorded in the analysed period.

V. CONCLUSION

The analysis of the phenomenon of suicide between 2014 and 2019, conducted in this paper on the basis of statistical data collected by the Polish Police Headquarters, allowed to draw synthetic conclusions. Statistically, the number of suicide attempts resulting in death is almost equal to the number of suicide attempts not resulting in death. Analyzing the phenomenon in terms of its dynamics, it is noted that in the years 2014-2018 the number of deaths by suicide attempts systematically decreased with a simultaneous increase in the number of suicide attempts. In 2019, there was an increase in the number of suicides, but the percentage of deaths in relation to suicide attempts, as in the entire period under review, continued to decrease.

In the years 2014-2019, the most common method of suicide, both attempted (56% of the total) and resulting in death (83%), was hanging. This method, according to the classification of suicide methods by the degree of violation of bodily integrity by B. Hołyst, is characterized by a high degree of damage to the body, and therefore by a high level of self-aggression. At the same time, it is the method with the highest effectiveness rate in the analyzed years. It is also noted, although with fluctuations in individual years, that there is a decrease in the choice of hanging as a suicide method in 2019 when compared to 2014.

Equally effective method of committing suicide is shooting oneself, and the tendency to use firearms in suicide attempts in the analyzed years is increasing, with a clearly higher expected death rate. However, the scale of this phenomenon is incomparably smaller, because suicides with the use of firearm are counted in dozens, while suicide by hanging is chosen by several thousands of individuals and the differences in the choice of these methods in individual years are proportional to their number.

The suicide methods that were high in numbers between 2014 and 2019, hanging aside, also include self-mutilation (9% of the total) and jumping from high altitude (8% of the total). Self-mutilation occurred twice as much in 2019 as in 2014, so this method is characterized by a significant increase in popularity. However, there are a few selected suicide methods that were not included in the statistical registers of the Polish Police Headquarters before 2017, which include e.g.,

suffocation and self-immolation.

In terms of methods of taking one's own life, a separate analysis of suicide attempts achieving the intended lethal effect was carried out in the years under study. The second most numerous, next to hanging, statistically recorded suicide method in the analyzed years was jumping from high altitudes (6% of the total). Cases of jumping in front of a moving vehicle, although their share in all fatal suicide attempts (less than 2%) is in stark contrast to suicide by hanging, nevertheless are recorded as the third most numerous suicide attempt method resulting in death in the years under study.

A person who undertakes a suicide attempt chooses a specific suicide method often with the awareness that it may end in two ways – either life or death. The effectiveness of suicide methods may condition this choice. The conducted analysis of suicide methods in terms of their effectiveness shows that in the years 2014-2019, the highest degree of effectiveness of suicide attempts was noted, as already mentioned, in suicide by hanging (76%), then shooting oneself (76%) followed by suffocation (52%), with the last method being included in the Polish Police Headquarters statistics only in 2017. The suicide method with the lowest degree of effectiveness in the examined years was taking various types of drugs (6%).

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