



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —



Doctoral School of Medicine

Doctoral Research Field: MEDICINE

DOCTORAL THESIS - SUMMARY

PARTICULAR ASPECTS OF SUICIDE WITH LETHAL OUTCOME, IN SIBIU COUNTY, IN THE CONTEXT OF COVID-19 PANDEMIC

PhD Candidate:

ROXANA-MIHAELA CRIȘAN

PhD Coordinator:

Prof. SILVIU MORAR, MD, PhD

CONTENTS



| | |
|--|----|
| FOREWORD | 1 |
| MOTIVATION FOR CHOOSING THE RESEARCH TOPIC | 7 |
| INTRODUCTION | 9 |
| PART I | 12 |
| I.1. THE SUICIDE PHENOMENON | 13 |
| I.1.1. COMPLETED SUICIDE - definition, general epidemiological data | 13 |
| I.1.2. THEORIES AND CLASSIFICATIONS OF COMPLETED SUICIDE..... | 14 |
| I.1.3. THE IMPACT OF THE SUICIDE PHENOMENON | 17 |
| I.1.4. SUICIDE RISK FACTORS..... | 18 |
| I.1.4.1. SOCIO-DEMOGRAPHIC FACTORS | 18 |
| I.1.4.2. MEDICAL-BIOLOGICAL FACTORS | 21 |
| I.1.4.3. SOCIO-MESOLOGICAL FACTORS..... | 26 |
| I.1.4.4. PSYCHOLOGICAL FACTORS..... | 31 |
| I.1.5. PREDICTORS OF COMPLETED SUICIDE..... | 32 |
| I.1.5.1. SUICIDAL IDEATION | 32 |
| I.1.5.2. COMMUNICATING SUICIDAL INTENT | 33 |
| I.1.5.3. SELF-HARM AND SUICIDE ATTEMPTS | 34 |
| I.1.5.4. CORRELATIONS BETWEEN ALCOHOL CONSUMPTION AND SUICIDE..... | 34 |
| I.1.5.5. SUICIDAL BEHAVIOUR, THE 'COPYCAT' SUICIDE | 35 |
| I.2. THE CONTRIBUTION OF FORENSIC PATHOLOGY TO THE STUDY OF SUICIDE | 36 |
| I.2.1. ON-SITE INVESTIGATION | 36 |
| I.2.2. FORENSIC AUTOPSY | 37 |
| I.2.2.1 SUICIDE METHODS..... | 38 |
| I.2.3. COMPLEMENTARY (LABORATORY) EXAMINATIONS | 40 |
| I.2.4. DIFFERENTIAL DIAGNOSIS | 41 |
| I.2.3. THE PSYCHOLOGICAL AUTOPSY METHOD AND ITS IMPORTANCE | 45 |
| I.3. COMPLETED SUICIDE IN THE CONTEXT OF THE COVID-19 PANDEMIC | 47 |
| I.3.1 COVID-19 PANDEMIC - EPIDEMIOLOGICAL DATA | 47 |

| | |
|---|------------|
| I.3.2. SARS-CoV-2 INFECTION AND ITS NEURO-PSYCHICAL IMPLICATIONS | 47 |
| I.3.3. SUICIDE RISK FACTORS ASSOCIATED WITH THE COVID-19 PANDEMIC | 49 |
| I.3.3.1. SOCIO-DEMOGRAPHIC FACTORS | 49 |
| I.3.3.2. MEDICAL-BIOLOGICAL FACTORS | 50 |
| I.3.3.3. SOCIO-MESOLOGICAL FACTORS | 51 |
| I.3.3.4. PSYCHOLOGICAL FACTORS..... | 51 |
| I.3.3.5. PREDICTORS OF COMPLETED SUICIDE..... | 52 |
| I.3.4. SUICIDAL MOTIVES ASSOCIATED WITH THE COVID-19 PANDEMIC | 53 |
| PART II..... | 55 |
| II.1. PERSONAL CONTRIBUTIONS | 56 |
| II.1.1. PREMISES: POSSIBLE CHANGES IN THE CHARACTERISTICS OF COMPLETED SUICIDE IN THE CONTEXT OF THE COVID-19 PANDEMIC, IN SIBIU COUNTY | 56 |
| II.1.2. WORKING HYPOTHESIS AND GENERAL OBJECTIVES | 56 |
| II.1.3. GENERAL RESEARCH METHODOLOGY | 57 |
| STUDY I | 61 |
| II.2. STUDY NO. 1: STATISTICAL ANALYSIS OF SUICIDE WITH LETHAL OUTCOME IN SIBIU COUNTY, IN THE 2018-2019 TIMEFRAME, COMPARED TO THE PERIOD BETWEEN 2020-2021 .. | 62 |
| II.2.1. Introduction | 62 |
| II.2.2. Purpose and objectives | 62 |
| II.2.3. Material and method | 63 |
| II.2.4. Results | 64 |
| II.2.5. Discussions | 90 |
| II.2.6. Conclusions | 104 |
| STUDY II | 108 |
| II.3. STUDY NO. 2: THE STUDY OF SUICIDE WITH LETHAL OUTCOME IN PATIENTS WITH MENTAL ILLNESS DIAGNOSED IN SIBIU COUNTY - COMPARATIVE ANALYSIS OF THE TIMEFRAME 2018-2019 (PRE COVID-19 PANDEMIC) VERSUS THE PERIOD BETWEEN 2020-2021 (INTRA COVID-19 PANDEMIC)..... | 109 |
| II.3.1. Introduction | 109 |
| II.3.2. Purpose and objectives | 109 |
| II.3.3. Material and method..... | 110 |
| II.3.4. Results | 112 |
| II.3.5. Discussions | 145 |
| II.3.6. Conclusions | 165 |

| | |
|---|------------|
| STUDIUL III | 170 |
| II.4. STUDY NO. 3: INVESTIGATION BY USING THE PSYCHOLOGICAL AUTOPSY METHOD OF THE SUICIDE CASES WITH LETHAL OUTCOME FROM THE CASUISTRY OF THE FORENSIC DEPARTMENT OF SIBIU COUNTY, IN THE PERIOD BETWEEN 2020-2021 | 171 |
| II.4.1. Introduction | 171 |
| II.4.2. Purpose and objectives | 172 |
| II.4.3. Material and method | 173 |
| II.4.4. Results | 177 |
| II.4.5. Discussions | 207 |
| II.4.6. Conclusions | 217 |
| GENERAL CONCLUSIONS..... | 223 |
| ORIGINALITY AND INNOVATIVE RESEARCH CONTRIBUTIONS | 226 |
| PROPOSALS, CHALLENGES, AND FUTURE DIRECTIONS..... | 228 |
| ETHICAL CONSIDERATIONS | 229 |
| ABBREVIATIONS USED IN THE TEXT..... | 230 |
| REFERENCES | 231 |

Keywords: *forensic pathology, completed suicide, particular aspects, COVID-19 pandemic, suicide risk factors, mental illness, suicidal motives, depressive syndrome, warning signs*

MOTIVATION FOR CHOOSING THE RESEARCH TOPIC

Suicide is a serious public health problem,(1) ranked worldwide as the tenth leading cause of death, which, despite significant advances in the field of medicine, has remained constant over time.(2)

Suicide affects not only the individual himself in a direct and sometimes irrevocable way but also has a great impact on family, friends and society. Suicide possesses a multifactorial determinism, with multiple etiopathogenetic factors grafted onto an unstable background of the mental equilibrium. Interest in suicide research has taken on new dimensions with the onset of the biggest health crisis in recent decades, namely the COVID-19 pandemic.(6)

The dramatic spread of the SARS-CoV-2 infection has endangered human lives, disrupted livelihoods and affected trade, economy and business around the globe. Population health is paramount in the process of sustainable socio-economic development, thus the study of the evolving trends of suicidality under the pandemic and post-pandemic COVID-19 conditions is a necessity.

There is not enough data on the specifics of lethal suicide in the context of a pandemic, thus with the onset of the COVID-19 pandemic, this phenomenon has become a research topic of great interest.

We considered it necessary to update the information on suicide with lethal outcome in Sibiu County, with recent statistical data on the phenomenon's evolution. The accuracy of the data obtained is ensured by the fact that, in accordance with the current legislation, all cases of suicide go through forensic research. In addition, my presence as a resident physician in Forensic Department of Sibiu County has allowed me constant access to the forensic evaluation of each case of completed suicide occurring in the period between 2020-2021 (COVID-19 pandemic period). It also allowed me to apply the psychological autopsy method, being able to investigate suicidal motives and behavioral changes in the antecedents for each case.

Such a multidisciplinary approach to lethal suicide has led to results that can form the basis of up-to-date, effective and appropriate prophylactic measures aimed at protecting the mental health of society, both during and after the COVID-19 pandemic, through early detection of psycho-emotional consequences that can have unpredictable effects and consequences on the mental state of the individual. At the same time, this data could be integrated and compared to similar studies, creating an important database for further strategies on suicide management during the pandemic. Data from the literature shows that suicides can be prevented through low-cost interventions in a timely manner and that a multisectoral strategy is needed for positive results to occur;(5) however, knowledge on and updating of suicide data are imperative for these efforts.

**PRESENTATION OF THE THEORETICAL FRAMEWORK OF
THE RESEARCH**

I.1. THE SUICIDE PHENOMENON

I.1.1. COMPLETED SUICIDE - definition, general epidemiological data

The complexity of the suicidal phenomenon makes it difficult to formulate a definition of suicidal behavior, thus no definition has unanimously been accepted by researchers in the field of suicidology.

Suicide is considered by some authors to be 'the deliberate, successful, self-injurious act resulting in death, an act that took place within the broad limits of normal cognition and within a clear elementary consciousness, regardless of the motivation for the action', while attempted suicide is 'unsuccessful suicide, with similar factorial conditioning'.(3,11)

According to estimates presented by the WHO (World Health Organization), in 2019 (prior to the COVID-19 pandemic), nearly 800,000 people died each year due to suicide, i.e. one every 40 seconds.(13)

According to the reports on the activity of the Forensic Medicine Network in 2018 and 2019 of the National Institute of Forensic Medicine 'Mina Minovici' Bucharest, in Romania, an important indicator in the category of violent deaths is that of suicides. These recorded 2451 cases of suicide (23% of all violent deaths) during 2018 and 2401 cases of suicide (25% of all violent deaths) during 2019.(15)

I.1.2. THEORIES AND CLASSIFICATIONS OF COMPLETED SUICIDE

The development of a unified classification of suicide continues to be a controversial and topical issue. Several classifications have attempted to respect a series of distinctions that are absolutely necessary to delineate the many aspects of the complexity of the suicide phenomenon. Many classifications support the etiopathogenetic theory that generated them.

Among the many classifications that have emerged in literature, we have reviewed the interpretation of some classifications and theories that have a potential role in explaining the link between suicide and pandemics, including the classification proposed by Durkheim,(3) Joiner's interpersonal theory,(16,19) social stress theory,(16,20) Klonsky and May's 'three-step' theory of suicide,(21) biological theories.(16) We have also described a study aimed at outlining a typology of people capable of suicide according to clinical, psychological and psychosocial factors.(17)

I.1.3. THE IMPACT OF THE SUICIDE PHENOMENON

Suicidal behavior is shaped by a complex set of risk and protective factors.(23) Suicidal behavior affects the individual, the people around him (family and non-family), and the treating physicians (family doctors, and psychiatrists who feel they have failed in their completion of the medical act).(27) This also perturbs the local community (in terms of 'suicidal contagiousness'),(28) and influences society in general.

I.1.4. SUICIDE RISK FACTORS

Knowledge of the interaction between risk factors and suicide is necessary because most suicide deaths are characterized by exposure to multiple stressors.(29) Thus, we found it necessary to describe general aspects related to suicide risk factors.

I.1.4.1. SOCIO-DEMOGRAPHIC FACTORS

Socio-demographic suicide risk factors include: gender - the percentage of men who commit suicide is about 80% of all suicides;(2) age - older people have a higher suicide risk,(35) particularly men over 65 years of age;(30) rural/urban environment - no firm correlation was found with a particular environment;(41,42,43,44) geographic distribution - there is statistical evidence to support differences between geographic areas;(1) marital status - increased suicide risk in divorced, widowed or separated people;(3,31,48) religion - there are conflicting reports, however, religious beliefs dramatically decrease suicide acceptance;(3) race; ethnicity; minority status.

I.1.4.2. MEDICAL-BIOLOGICAL FACTORS

The category of medical-biological suicide risk factors includes: organic diseases - a major suicide risk factor;(56) chronic physical illnesses, cancer,(57,58) associations between organic pathology and depressive or anxious symptoms(63,64) and some infectious diseases;(65) mental illnesses - data shows that 90% of those who have committed suicide meet the criteria for a psychiatric condition, among which major depressive syndrome, substance abuse disorders, personality disorders and schizophrenia were prevalent;(67-71) family history of suicide - higher rates of suicide were demonstrated in the offspring of suicidal parents as compared to the offspring of parents who did not engage in suicidal behavior;(89,94,96,97) suicide attempt in personal history - a previous suicide attempt is the most decisive risk factor for suicide in the general population;(13) sexual orientation; biorhythms; hereditary (genetic) factors; neurochemical factors; endocrine factors; biological crises; unintended pregnancy.

I.1.4.3. SOCIO-MESOLOGICAL FACTORS

The category of socio-mesological suicide risk factors includes: profession and occupation - there are professional groups with an increased risk of suicide, such as doctors, dentists, pharmacists, lawyers, engineers, chemists;(3) unemployment - relatively high risk (two to three times) of death by suicide, compared with people who are employed;(132) socio-economic status, social class and income (poverty) - there is an inverse relationship between social class, suicide and self-harm;(23) social isolation - unmarried individuals have an increased risk of suicide;(133) immigration, emigration, refuge; modelling influences, role of the media - there can be real suicide 'epidemics', which start due to an example;(3) accessibility of the means by which one can commit suicide - the use of particular means for suicide depends on the 'availability', 'existence' or 'accessibility' of opportunities to commit suicide in the everyday environment;(151) location of the suicidal act - most are produced at home, but there are also suicide sites of choice and suicide cases occurring during hospitalization, including during

psychiatric therapy;(3,88,164,165) seasonal variations, variations related to days of the week and time of day; meteorological factors.

I.1.4.4. PSYCHOLOGICAL FACTORS

Psychological factors are less quantifiable based on epidemiological data, but psychological and psychiatric investigations may reveal elements of suicidal behavior. For individuals who have committed suicide, the use of the psychological autopsy method can provide important insights into the structure of personality, stress response, and suicidal motivation.(181,182,183)

I.1.5. PREDICTORS OF COMPLETED SUICIDE

I.1.5.1. SUICIDAL IDEATION

Suicidal ideation comprises suicidal thoughts or ideas that describe desires and concerns pertaining to death and suicide.(194) Suicidal ideation varies in intensity, duration, and fluctuates in character; it is a better predictor of a lifetime suicide risk without being a predictor of an imminent suicide risk.(56)

I.1.5.2. COMMUNICATING SUICIDAL INTENT

It has been found that suicidal ideation and intent are often communicated prior to the suicidal act, but this communication of suicidal intent does not reach those close to the person.(196,197)

I.1.5.3. SELF-HARM AND SUICIDE ATTEMPTS

The presence of self-injury in the personal history may be an important predictor of suicide with a lethal outcome,(198) with individuals having a higher risk of suicide, but the relationship between self-injury and suicide has been shown to be complex.(199)

Suicide attempts in personal histories were found in 50-80% of suicide cases. The more violent and potentially lethal the suicide methods chosen in suicide attempts, the greater the future risk of suicide with a lethal outcome.(3)

I.1.5.4. CORRELATIONS BETWEEN ALCOHOL CONSUMPTION AND SUICIDE

Acute alcohol consumption plays an important role in facilitating suicidality by reversing cortical inhibition, increasing impulsivity and encouraging self-harm.(87,200,201)

Alcohol is an important risk factor, especially against a background of depression.(3) Research to determine the blood alcohol level of those who have committed suicide shows the presence of alcohol in 10-54% of cases.(203) The maximum disinhibitory effect of alcohol is recorded at blood alcohol values between 1-1.5 g‰.(3) Alcohol exacerbates symptoms of depression, anxiety, or bipolar disorder by decreasing dopamine levels, which is associated with impulsivity and is a risk factor for suicide.(96) Retrospective studies suggest that suicide usually occurs late in the stages of alcoholism and is associated with other suicide risk factors, including divorce, previous suicide attempts and increasing age. Alcoholism can lead to the severing of social and family ties and even social isolation.(201,206)

I.1.5.5. SUICIDAL BEHAVIOUR, THE 'COPYCAT' SUICIDE

Imitative suicide often referred to as the Werther effect, is an imitating suicidal behavior that occurs after exposure to another suicide.(207) Suicidal behavior is influenced by the impact of media reports depicting celebrity suicides, which can act as a 'trigger' for subsequent suicides completed by mimicking the behaviors presented during a broadcast.(147,149,208,209)

The more aggressive the media coverage of suicides committed by well-known personalities, the higher the suicide rate.(208) Data obtained on online suicides were a predictor of suicide risk among men.(210)

I.2. THE CONTRIBUTION OF FORENSIC PATHOLOGY TO THE STUDY OF SUICIDE

The position of Forensic Pathology as the 'host of completed suicide' is undeniable. The current Romanian legislation (Criminal Procedure and Special Regulations Code) stipulates the obligation for autopsy in any case of violent death, regardless of its legal form: hetero-aggression, accident, or suicide. The main consequence is to increase the validity of the epidemiological data, given that all cases of suicide are subject to forensic pathology investigation.(3) Specific means are used to achieve these objectives (on-site investigation, forensic autopsy, complementary investigations, etc.).

It is forensic pathology that specifies the suicide method, highlights the legal form of death, and uses objective criteria to distinguish between suicides and other forms of violent death (hetero-aggressions and accidents), as well as non-violent (pathological) deaths, thus avoiding the classification of cases as 'equivocal death'.(3)

I.2.1. ON-SITE INVESTIGATION

The on-site inspection of the body by the forensic pathologist should be tailored to the specific situation and is essential as it provides valuable information on how to approach the subsequent stages of the suicide investigation.(3,212,213,214)

I.2.2. FORENSIC AUTOPSY

The 'History of Death' includes the data obtained on the psychiatric history of the person who committed suicide (an important element for determining suicide by adhering to objective forensic criteria). The suicide confirmation, especially in atypical cases of suicide, will also be made according to particular criteria and following a rigorous differential diagnosis taking hetero-aggression and accident into consideration.(214,215)

I.2.2.1 SUICIDE METHODS

Suicide methods vary from country to country and according to the accessibility to the means by which one can complete it. For example, in the USA it was noted that shooting and poisoning were the most common methods used for suicide purposes.(61) In Romania, hanging was the

most common suicide method, poisoning was second, followed by suicide by jumping from heights.(3) From report analysis on the activity of the Forensic Medicine Network in 2018 and 2019, the constant preferred suicide method over the years remains hanging, with some otherwise relatively small fluctuations in the spectrum of suicide methods during recent years.(14,15)

I.2.3. COMPLEMENTARY (LABORATORY) EXAMINATIONS

Laboratory examinations are of real help during suicide research because they assist in outlining and supporting the identification of suicide cases. We have highlighted the role of histopathological examination, toxicological examination, blood stains, hairs and other examinations.

Complementary laboratory examinations of people who have committed suicide identify potentially modifiable suicide risk factors that can be included in suicide prevention measures.

I.2.4. DIFFERENTIAL DIAGNOSIS

SUICIDE-HETEROAGGRESSION-ACCIDENT

The on-site investigation, forensic autopsy, complementary examinations, as well as data on the medical and socio-economic history of the deceased, including suicide attempts from personal history (abandonment of other suicide methods represented by cervical wounds, injuries to the wrists, sub-lethal intoxication), can gather sufficient information to outline a positive diagnosis of suicide, allowing a rigorous differential diagnosis taking hetero-aggression and accidental injury into consideration.

Differential diagnosis to exclude hetero-aggression/homicide must include the absence of defensive injuries (elementary injuries on the ulnar edges of the forearms, cubital fracture, fractures of both forearm bones, etc.).

Self-inflicted lesions are generally located in accessible regions. Thus, we have reviewed the general characteristics, in cases where blunt, cutting and cutting-piercing objects have been used, as well as the characteristics of self-inflicted injuries by firearms.

We have pointed out the elements that make up the differential diagnosis between suicide-heteroaggression-accident in the following cases: precipitation (fall from height); in case of road and rail traffic events; mechanical asphyxiation; in case of use of physical agents (self-induced burns - self-induced ignition, hypothermia - quite rare, electrocution) as well as in cases of intoxication (easy access to toxic substances/gases such as insecticides, caustic substances or psychotropic drugs; the existence of toxic gas release facilities in enclosed spaces, even the connection of these toxic gases to the airways; evidence of tablets in gastric contents).

I.2.3. THE PSYCHOLOGICAL AUTOPSY METHOD AND ITS IMPORTANCE

The final aim of the psychological autopsy research is to outline the psychological profile and details of the suicidal person's life, which represents an 'open window' to the self, a detailed analysis of risk factors, precipitating factors and factors leading to the suicidal act, as well as the motivation for the self-harm.(233)

The real incidence of suicidal behavior may be under-reported even in forensic medicine, while there are also equivocal cases that can be classified as suicides; sometimes only after rigorous application of the psychological autopsy method can suicide be determined.

Psychological autopsy increases the accuracy of statistical reporting of completed suicide. It is designed to determine the psychological intent of the victim by reconstructing the behavior, communications, history, habits and personality traits of the deceased, and helps to reduce labeling the 'equivocal death'.(235)

I.3. COMPLETED SUICIDE IN THE CONTEXT OF THE COVID-19 PANDEMIC

The diagnosis of SARS-CoV-2 infection, isolation, quarantining, social distancing and socio-economic consequences generated by the pandemic created the premises for typical mental health distress, triggering psychological mediators such as sadness, worry, fear, anger, annoyance, frustration, guilt, helplessness, loneliness, nervousness, stigma, etc.(16,246)

Mental health experts have alerted the world to the risk of a potential increase in suicide rates as the pandemic evolves, using phrases such as 'a suicide tsunami', 'dual suicide and COVID-19 pandemic', and 'suicide mortality'.(245) Suicide cases that apparently were related to COVID-19, reported even in our country, appeared from the first months of the COVID-19 pandemic.(246,247)

I.3.1 COVID-19 PANDEMIC - EPIDEMIOLOGICAL DATA

The COVID-19 pandemic with its starting point in Wuhan, China emerged in December 2019. It evolved in less than two months into a global public health threat.(16,248) In Romania, the impact of the COVID-19 pandemic was a major one, which showed a dramatic reality, as statistical figures reported in mid-October 2021 almost 20,000 infections and more than 500 deaths per day.(249,250)

I.3.2. SARS-CoV-2 INFECTION AND ITS NEURO-PSYCHICAL IMPLICATIONS

The SARS-CoV-2 virus can invade the central nervous system (CNS) as well as the peripheral nervous system (PNS), causing multiple neurological diseases such as encephalitis, encephalopathy, Guillain-Barré syndrome and meningitis, but the precise mechanisms of SARS-CoV-2 neuroinvasion have not been fully established.(261,262)

Patients with SARS-CoV-2 are also at risk of developing neuropsychiatric disorders.(263) The nervous system may be affected by the development of metabolic or hypoxic lesions, neuroinflammation, hypercoagulability and post-virally triggered autoimmune responses due to infection with SARS-CoV-2.(264) Specialized literature mentions psychiatric disorders such as psychosis, insomnia, and changes in general mood in the first phase and highlights depression and anxiety disorders during the evolution of the infection.(265,266)

I.3.3. SUICIDE RISK FACTORS ASSOCIATED WITH THE COVID-19 PANDEMIC

There is evidence to support the existence of suicidal ideation and suicide attempts due to the experiences of the -COVID-19 pandemic. During the COVID-19 pandemic, it was found that a significant proportion of people with recent suicidal ideation explicitly linked their suicidal thoughts to the COVID-19 pandemic.(276)

Suicidal risk factors can play a very important role in precipitating predispositions to mental illness in those without a psychiatric history or can exacerbate symptoms in those with pre-existing psychiatric disorders.(279,280)

I.3.3.1. SOCIO-DEMOGRAPHIC FACTORS

According to updated sources, there is a higher frequency of completed suicide in the male population.(281,282) In Bangladesh, the following suicide risk factors have been identified: the female gender, divorced, widowed, unmarried, unemployed and childless people, from urban environments and of a higher socio-economic class.(284)

I.3.3.2. MEDICAL-BIOLOGICAL FACTORS

In addition to the aforementioned somatic pathology, the outbreak of the COVID-19 pandemic and the easy and uncontrolled spread of the SARS-CoV-2 infection have highlighted the impact of potentially lethal infectious diseases on mental health. In this context, the COVID-19 pandemic has been seen as having the potential for a huge increase in suicides, similar to a 'tsunami'.(245)

Multiple hypotheses have been formulated, including the fact that stress and the immune response to this infection may lead to susceptibility to suicidal risk.(16)

In terms of psychiatric pathology, depression is by far one of the most significant risk factors for suicide.(287)

I.3.3.3. SOCIO-MESOLOGICAL FACTORS

There was an increased risk of suicide among frontline workers (health care professionals), the elderly, immigrants, the homeless, socioeconomically poor classes, and those with pre-existing mental disorders, substance abuse, and family history of suicide.(16)

I.3.3.4. PSYCHOLOGICAL FACTORS

The psycho-emotional implications of the COVID-19 pandemic, generated by the positive determination of the infection, isolation, quarantine, social disconnection, distancing and economic consequences can trigger psychological changes such as sadness, anxiety, worry, fear, anger, upset, nervousness, frustration, guilt, helplessness, general and psychological distress, interpersonal issues, domestic abuse, loneliness and nervousness, effects due to social distancing, financial difficulties and losses, fear of physical harm, fear, i.e. extreme fear of infection with COVID-19, including symptoms of post-traumatic stress disorder, worries about being a burden to loved ones, confusion, anger, hopelessness, worry, boredom, anxiety caused by perceiving supplies as inadequate, inadequate information, fear of stigmatization.(246,278,279,283)

I.3.3.5. PREDICTORS OF COMPLETED SUICIDE

Several risk factors can lead to suicidal ideation and suicide attempts, thus the COVID-19 pandemic, with its multiple implications, has unbalanced vulnerable people and led to suicidal behaviors.(10,296-299)

Suicidal ideation during the COVID-19 pandemic was based on the following risk factors: quarantine, loneliness, insomnia, low social support, mental state imbalance, high physical and mental exhaustion, lower self-reported physical health among frontline health workers, etc. Thus, an increase in the suicide rate is predicted in the future.(300)

I.3.4. SUICIDAL MOTIVES ASSOCIATED WITH THE COVID-19 PANDEMIC

Particular cases are described in the literature where suicide attempts and completed suicide have been associated with the COVID-19 pandemic.(246,279,287,303,304,305) In these individuals, the suicidal motivation was triggered in the context of the COVID-19 pandemic by the moral duty not to transmit the presumed infection, fear and panic of acquiring the infection, fear of not getting infected, excessive fear of a painful death due to the disease, social withdrawal and lack of activities that they enjoyed, etc.



PERSONAL CONTRIBUTIONS

II.1. PRESENTATION OF THE RESEARCH FRAMEWORK

II.1.1. PREMISES: POSSIBLE CHANGES IN THE CHARACTERISTICS OF COMPLETED SUICIDE IN THE CONTEXT OF THE COVID-19 PANDEMIC, IN SIBIU COUNTY

The epidemiological approach to the suicide phenomenon is a first step in attempting to know the extent of this phenomenon, which appeared during the COVID-19 pandemic in Sibiu County.

II.1.2. WORKING HYPOTHESIS AND GENERAL OBJECTIVES

The research aimed to specify the peculiarities of suicide with lethal outcomes in Sibiu County, which occurred during the COVID-19 pandemic.

The main objectives of the research were the following: to assess the epidemiological characteristics of suicides in the period between 2018-2019 (the pre-pandemic period) as compared to the 2020-2021 timeframe (the COVID-19 pandemic period) and the proportion of suicides within the total number of outcomes ending in violent deaths; to analysis the main suicide risk factors, suicide methods and acute alcohol consumption; to identify a 'profile' of the suicidal person during the COVID-19 pandemic period, but also during the COVID-19 pre-pandemic period; to carry out a statistical-epidemiological analysis of people with psychiatric pathology and to highlight possible reasons for suicide as well as potential warning signs in the history of suicides. Investigation of additional suicide risk factors, suicidal motives, predictors, highlighting warning signs, as well as the 'profile' of the suicidal person during the COVID-19 pandemic (by administering a specially designed questionnaire - with the value of a psychological autopsy, which led to obtaining useful hetero-anamnestic data).

The final aim of the research is to develop an updated database on suicide in Sibiu County, which will specify the particularities of this phenomenon in the context of the COVID-19 pandemic.

II.1.3. GENERAL RESEARCH METHODOLOGY

The entirety of the case files from 2018-2021 of the Forensic Department of Sibiu County served as the study material for this purpose. All cases of completed suicide autopsied within the Forensic Department of Sibiu County (including the Mediaş Forensic Office) were identified and the related forensic documents were analyzed.

The research is based on a combined methodology. We conducted a descriptive, epidemiological, observational, complex study, analyzing epidemiological data.

The Ph.D. research has two components: a retrospective component for the period 2018-2019 (01 January 2018 - 31 December 2019) and a prospective component, for the period 2020-2021 (01 January 2020 - 31 December 2021) where we investigated epidemiological data.

We analyzed data from forensic autopsy reports, medical death certificates and toxicology records (to assess trends and main suicide risk factors). We analyzed the general clinical observation sheets (from the archive of the Clinical Psychiatric Hospital 'Dr. Gh. Preda' Sibiu), in people with pre-existing psychiatric pathology, who committed suicide in the period 2018-2021 and whose psychiatric diagnosis was established during their lifetime, in the above mentioned psychiatric hospital. By analyzing general clinical observation sheets we extracted data on suicidal risk factors, potential suicidal motives and we assessed fifteen behavioral signs: (1) communication of suicidal ideation; (2) sadness; (3) tendency to isolation; (4) restlessness; (5) aggressiveness; (6) nervousness; (7) insomnia; (8) chronic fatigue; (9) lack of participation in family life; (10) lack of participation in social life; (11) feelings of worthlessness; (12) feelings of guilt; (13) feelings of inferiority; (14) lack of self-confidence; (15) loss of interest in life. In a subsequent step, we administered a specially designed questionnaire used to identify suicide risk factors, suicidal motivation and certain warning signs (based on newly emerging behavioral and intrapsychic changes) as perceived by the caregivers before the lethal suicidal act.

The criteria according to which we selected the subjects: common criteria - all cases of completed suicide, which have passed through the forensic pathway in the Forensic Department of Sibiu County, during the period between 2018-2021; specific criteria - we also included in the study those cases of equivocal death, which, later, by applying the method of the psychological autopsy, were labeled as suicides; exclusion criteria - cases in which the relatives of the deceased would have explicitly refused the inclusion of the case in the study, mentioning that no such cases apply to this work.

During the research, the confidentiality of data, both of the deceased and of the relatives, was strictly respected, in accordance with national laws and regulations for the protection of data. The multifactor statistical-mathematical analysis of the data obtained was performed using Microsoft Office Excel 2019, Prism GraphPad v 8.0.0.2, and I.B.M. software. S.P.S.S. Asmos 26*.

II.2. STUDY NO. 1: STATISTICAL ANALYSIS OF SUICIDE WITH LETHAL OUTCOME IN SIBIU COUNTY, IN THE 2018-2019 TIMEFRAME, COMPARED TO THE PERIOD BETWEEN 2020-2021

II.2.1. Introduction

Suicide is a public health problem with etiological heterogeneity, where suicide risk factors (socio-demographic, medical-biological, socio-mesological, and psychological) overlap and where there are differences between age groups, gender and geographical regions(307).

II.2.2. Purpose and objectives

This study started as a knowledge record of the evolutionary trend of the suicide phenomenon during the COVID-19 pandemic in Sibiu County and aims at an epidemiological analysis of violent deaths of a forensic nature, throughout Sibiu County, in order to observe the extent of the suicide phenomenon in relation to other violent deaths (accidental deaths, homicides). Afterwards we analyzed this phenomenon in terms of the main suicide risk factors in order to further investigate deaths by suicide.

Specific objectives: To assess deaths of violent nature, the proportion of suicides with lethal outcome and to analyze the way tanatogenic injuries occur; to analyze the main suicide risk factors (gender, age, background, marital status, nationality/ethnicity, religion, level of education, economic activity, place of the suicidal act, seasonality of the suicidal act, monthly variability of the suicidal act, day of the week of the suicidal act); identification of methods of suicide; highlighting the role of acute alcohol consumption; identification of the 'profile' of the person at risk of emergence of the suicidal act during the COVID-19 pandemic period - (2020-2021) as compared to the pre-pandemic period (2018-2019).

This study provides an overview of completed suicides, in the context of the COVID-19 pandemic, in Sibiu County, highlighting its evolutionary trends.

II.2.3. Material and method

We conducted an epidemiological survey, with two components: a retrospective one (period 2018-2019) and a prospective one (period 2020-2021).

The study material was provided by the case files pertaining to forensic pathology from the entire county of Sibiu. Suicide cases were autopsied at the Forensic Department of Sibiu County. The reference population was the population of Sibiu County. The time interval analyzed: 1 January 2018 - 31 December 2021, a period that was divided into two: the period 2018-2019 (prior to the COVID-19 pandemic) and the period 2020-2021 (the COVID-19 pandemic period).

The methodology used included: analysis of forensic autopsy records; analysis of toxicology records (we extracted the results of the toxicological examinations performed, including the blood alcohol level); analysis of medical certificates of death and analysis of forensic autopsy reports (from which we extracted and verified data on gender, age, nationality, religion, level of education, economic activity and marital status, suicide method and blood alcohol level).

II.2.4. Results

In this chapter, we have presented in detail the results obtained on: the distribution of forensic autopsies, the percentage of suicides in total forensic autopsies, the distribution of legal forms in violent deaths, the distribution of violent deaths according to the way deadly injuries occur, suicide risk factors - according to gender, age, background, marital status, nationality, religion, level of education, economic activity, the place where the suicidal act occurred, season, monthly variability, day of the week; method of suicide; alcohol intoxication and an etiology of suicide by intoxication.

II.2.5. Discussions

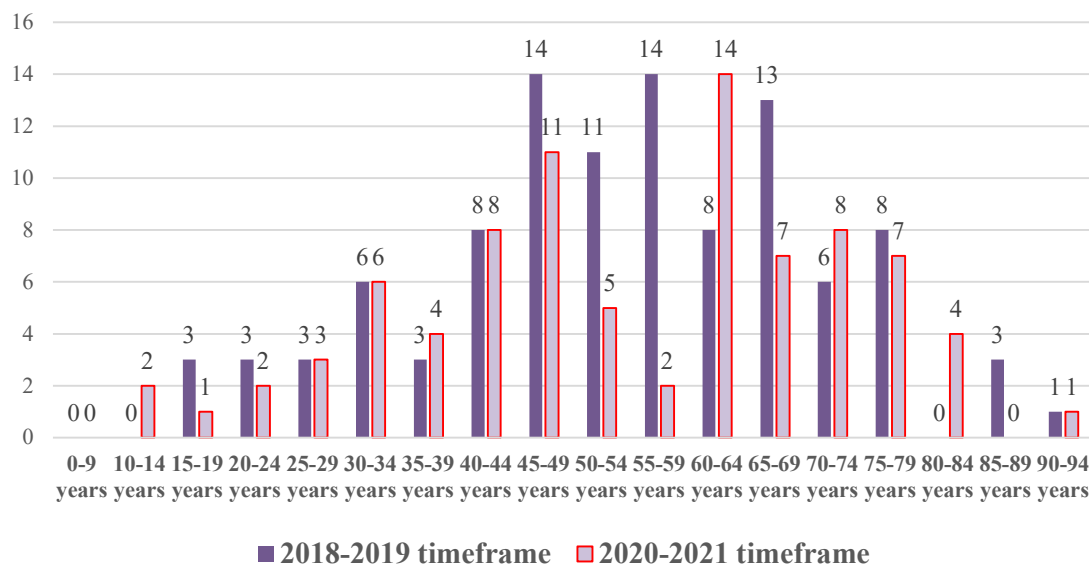
Analysis of the above results revealed changes during the COVID-19 pandemic period (2020-2021 period) as compared to the pre-COVID-19 pandemic period (2018-2019 period).

We have documented decreases in the number of forensic cases from 469 (47.90%) in 2018-2019 to 390 (42.03%) in 2020-2021. The largest decrease in violent deaths, including suicides, was found in 2020, the year corresponding to the first year of the COVID-19 pandemic, and in the following year, 2021, the trend was upward but did not reach the number of cases recorded in the years before the COVID-19 pandemic. Although the number of suicide cases decreased, their percentage in the total forensic autopsies, i.e. in violent deaths, saw just a small decrease: from 10.63% to 9.16%, respectively from 22.17% to 21.79%.

We have identified changes including the main suicide risk factors thus we have highlighted the following:

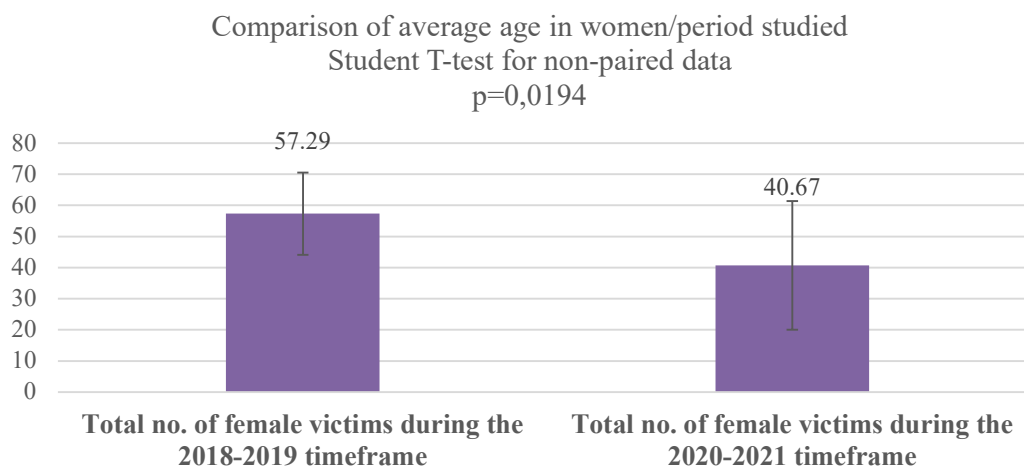
- Males showed a higher suicide risk, evidenced by an increase in the proportion of suicides recorded in males from 83.65% in 2018-2019 to 89.41% in the pandemic period (M/F gender ratio increased from 5.11:1 in 2018-2019 to 8.44:1 in 2020-2021).
- We noted an increasing trend in the number of suicide cases in the age range 60-84 years: 40 cases (47.06%) in the period 2020-2021, as opposed to 35 cases (33.65%) in the period 2018-2019; thus, we brought into question the vulnerability of older people (over 60 years) in the pandemic context (Figure no. 1).

Figure no. 1 - Graphical representation of suicides by age group; Sibiu County; 2018-2019, 2020-2021



We showed a statistically significant difference ($p=0.0194<0.05$) in the average age (57.29) for women from 2018-2019 and the average age (40.67) for women from 2020-2021 (Figure no. 2).

Figure no. 2 - Comparison of the average age of female suicide victims; Sibiu County; 2018-2019, 2020-2021



- We found a decrease in the number of cases from 60 (57.69%) to 47 (55.29%) suicides for the urban environment and a decrease from 44 (42.30%) to 38 (44.70%) suicides for the rural environment; both the percentage of cases and the U/R ratio showed no major differences between the periods studied.

- We noted the increase in the number of suicides among people with anomic status (unmarried, divorced, widowed) in the period 2020-2021, to 65.88% (56 cases) from 58.65% (61 cases).

- The majority of suicides were naturally Romanian (92.31% in 2018-2019 and 88.23% in 2020-2021) and Orthodox, with a decrease from 97 (93.27%) to 73 (5.88%) in 2020-2021.

- Differences between the selected periods, consisting of a decrease in the number of cases and percentage during the COVID-19 period, were observed among those who had completed a vocational school, from 38 (36.54%) to 22 (25.88%) cases.

- Retired persons ranked first in suicides in both periods studied. There was an increase in their percentage during the pandemic period (from 39.42% to 45.88%); among people without occupation, there was a decrease in the number of suicides and their percentage during the COVID-19 pandemic period, from 31 (29.81%) to 17 suicides (20.00%) during 2020-2021.

- During the COVID-19 pandemic period, with the measures and restrictions imposed, cases of suicide at home increased to 60 (from 41 in 2018-2019) and their percentage to 70.59% (from only 39.42% in the pre-pandemic period); deaths in hospital (less common) experienced a slight increase during the pandemic period, both in the number of cases (from 12 to 13) and especially in percentage (from 11.54% to 15.29%).

- In the spring, a significant decrease in the 2020-2021 period to 19 (22.35%) from 33 (31.73%) suicides in 2018-2019 was detected, possibly correlated with the onset of the COVID-19 pandemic in the spring of 2020.

- The differences between the periods analyzed for March, from 13 (12.5%) to 6 (7.06%) cases, and for April, from 11 (10.58%) to 6 (7.06%) cases, could be a consequence of the

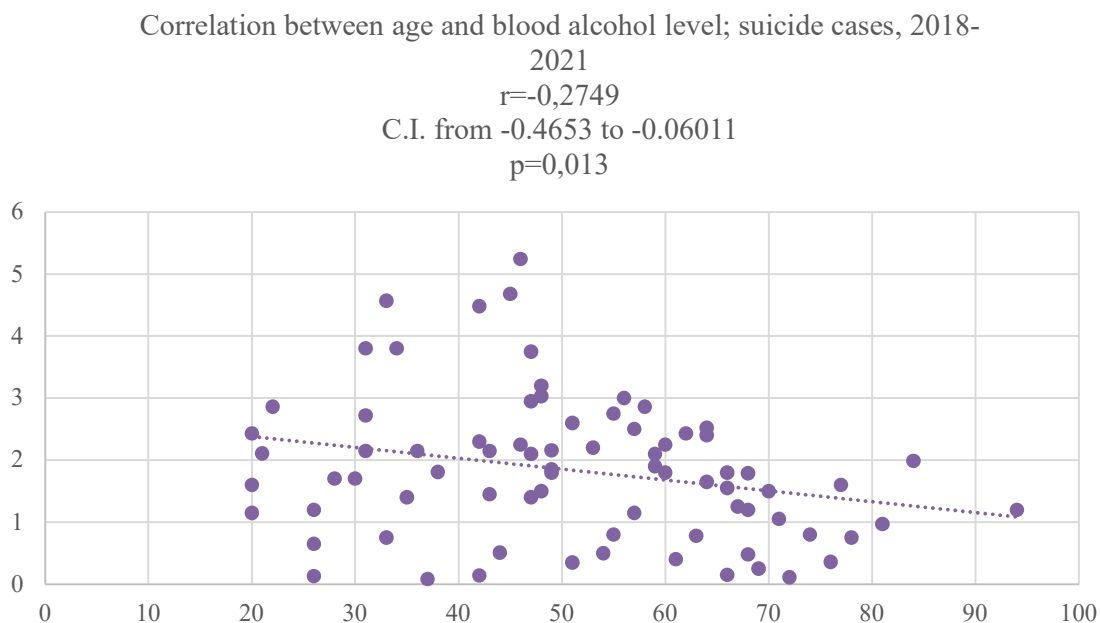
COVID-19 pandemic, in the context in which safety measures regarding the spread of the virus were imposed in spring 2020.

- During 2018-2019, most cases were recorded on Fridays (21 cases; 20.19%) and Sundays (17 cases; 16.34%), and during the COVID-19 pandemic period, there was a relatively constant number for weekend days (Friday, Saturday, and Sunday), with the maximum number of cases on Mondays (20 cases; 23.53%).

- Suicide by hanging remained the preferred method throughout both periods, with a slightly higher percentage during the pandemic period (75.29%) than in the pre-pandemic period (74.04%); jumping from heights placed second in both periods studied; in the 2018-2019 period the third favored suicide method was drowning, with 7 cases (6.73%), and in the COVID-19 pandemic period the third most common way to commit suicide was surprisingly self-inflicted burns, with 3 cases (3.53%).

- During the COVID-19 pandemic, acute alcohol consumption was detected in 31 of the 77 cases where alcohol tests were used, representing 40.26%. With the highest frequency, we detected blood alcohol values ranging from 0.01-1 g ‰ and 1.51-2.5 g ‰ (10 cases for each range; 12.99%). There was a statistically significant correlation between the blood alcohol values at the time of the suicidal act and the age of the persons who committed suicide in the 2018-2021 period ($p=0.013 < 0.05$); we found that the highest level of blood alcohol values was found in young subjects. As age increases, the level of blood alcohol values decreases and vice versa, as shown in figure no. 3.

Figure no. 3 - Correlation between age and blood alcohol level at the time of suicide; Sibiu County; 2018-2021



All the data presented have allowed me to outline the 'profile' of the person at maximum risk of committing the suicidal act in the 2018-2019 and 2020-2021 periods.

The 'profile' of the suicidal person in 2018-2019 (pre-pandemic period): male; age group: 45-49 years, 55-59 years, 65-69 years or 50-54 years (in descending order); urban background; anomic marital status (single, divorced, widowed); Romanian nationality; Orthodox religion; education level: vocational school, high school or having completed 5 to 8 grades; economic activity: retired, unemployed or employed (in descending order); place of the suicidal act: in places other than home or hospital; suicidal act occurs in spring (March, April) or summer (July, August); suicidal act occurs on Friday, Sunday, Monday or Thursday; methods of suicide: hanging, precipitation, drowning; acute consumption of alcohol before the suicidal act, with blood alcohol values between 1.0-2.49 g‰.

The 'profile' of the person at highest risk of suicidal act emergence, 2020-2021 (pandemic period): male; age group: 60-64 years or 45-49 years; high risk also between 65 and 84 years; originating from an urban environment; anomic marital status (single, divorced, widowed); Romanian nationality; Orthodox religion (but also other religions - Greek Catholic, Roman Catholic, Evangelical, Baptist, Pentecostal); level of education: high school, vocational school or education between 5 to 8 grades; economic activity: retired, employed or unemployed (in descending order); place of the suicidal act: at home; suicidal act occurs in summer (July and August) or in October; suicidal act occurs on Monday, Saturday, Friday or Sunday; suicidal methods: hanging, jumping from heights, self-inflicted burns, but also other harsh or atypical methods of suicide; with acute consumption of alcohol before the suicidal act, with blood alcohol values between 0.01-0.99 g‰ and between 1.5-2.9 g‰.

II.2.6. Conclusions

Detailed analysis of the main suicide risk factors led to the following conclusions:

Suicide accounted for 22.00% of all violent deaths. Although the number of cases decreased during the pandemic period, the percentage of violent deaths did not fluctuate greatly between the periods analyzed.

Detailed analysis of the main suicide risk factors led to the following conclusions:

- During the COVID-19 pandemic an additional vulnerability of the male gender emerged.
- In the 2020-2021 period, the increased number of suicides in the 45-49 age group kept its level, but we recorded the highest number of suicides in the 60-64 age group. In the 2020-2021 period, almost half of the people who committed suicide (47.06%) were over 60 years of age, thus pointing to the increased suicide risk among older people within the pandemic context. In the COVID-19 pandemic period, we noted a statistically significant difference between the average age in women (40.67) and the average age in men (55.88), contrasting the 2018-2019 period where these differences were not statistically significant. A statistically significant difference was also found between the average age of women in the 2018-2019 period (57.29) and the average age of women in the 2020-2021 period (which decreased to 40.67).
- Although the number of suicide cases from the urban environment decreased in the 2020-2021 period (from 60 to 47), their percentage and U/R ratio did not show major differences for the periods studied.

- We documented the role of anomic marital status (unmarried, divorced, or widowed) as a risk factor. During the COVID-19 pandemic, the proportion of anomic marital status increased from 58.65% to 65.88%, while the number and proportion of married people decreased (from 43 to 29 cases; from 41.35% to 34.12%). These data confirm the vulnerability to suicide conferred by anomic marital status, i.e., the protective role of the family, including in a pandemic context.

- In both periods studied, the majority of suicides were among people of Romanian nationality and Orthodox religion, with no major differences.

- Analysis of the education level of those who committed suicide revealed a preponderance of those who had graduated from a vocational school. During the COVID-19 period, we noted a moderate decrease in the number of cases and the percentage of people in the 'vocational school' category and a minimal increase in the percentage of people in the 'higher education' category.

- In the case of retired people, although the number of cases decreased to 39 (2020-2021 period) from 41 (2018-2019 period), the percentage increased during the pandemic period to 45.88% (from 39.42% in the pre-pandemic period).

- In the context of the COVID-19 pandemic, the suicides committed at home were more numerous and had a much higher proportion, reaching 70.59% (60 cases), as compared to 39.42% (41 cases) in the pre-pandemic period.

- During the pandemic period (2020-2021) a significant decrease in suicides has been observed in spring.

- We found a decrease in the proportion of suicides during the COVID-19 pandemic -in March and April.

- During the pandemic period, the proportion of suicides increased on Mondays and decreased at the end of the week, without these variations reaching statistical significance.

- The comparative analysis of the pre-pandemic and pandemic periods revealed that hanging remained the method of choice for suicide, with a similar proportion. Jumping from heights also remained second during both periods. In contrast, drowning, which ranked third in the 2018-2019 period, disappeared as a suicide method in the pandemic period, possibly due to the imposed movement restrictions.

- During the COVID-19 pandemic period, the third place was taken by suicides by self-inflicted burns with 3 (3.53%) cases, a method that in 2018-2019 was found in only one case. We also noted, during the COVID-19 pandemic period, the emergence of other 'hard' and/or atypical suicide methods (road traffic event, self-hitting against blunt objects, other methods of asphyxiation by deprivation of O₂ - using adhesive strips and plastic bags).

- In the pre-pandemic period acute alcohol consumption was identified in an even higher percentage than during the pandemic period. Analysis of the correlation between acute ethyl alcohol consumption and blood alcohol values on the one hand and the gender and age of those who committed suicide on the other hand revealed a statistical significance in the presence of higher blood alcohol values among young males in the period 2018-2021.

II.3. STUDY NO. 2: THE STUDY OF SUICIDE WITH LETHAL OUTCOME IN PATIENTS WITH MENTAL ILLNESS DIAGNOSED IN SIBIU COUNTY - COMPARATIVE ANALYSIS OF THE TIMEFRAME 2018-2019 (PRE COVID-19 PANDEMIC) VERSUS THE PERIOD BETWEEN 2020-2021 (INTRA COVID-19 PANDEMIC)

II.3.1. Introduction

The impact of the COVID-19 pandemic on people with mental illness has been assessed to be a significant negative influence, as most mental disorders have a complex association with stress, leading to increased incidence and rates of suicidal relapse. There is still insufficient research on the relationship between mental disorders during viral pandemics and completed suicide, particularly in Romania.

II.3.2. Purpose and objectives

Due to the insufficient information on the impact of COVID-19 on psychiatric patients who committed suicide during the pandemic, we considered it necessary to obtain data that would highlight the particularities of the psychological profile of the suicidal person with pre-existing psychiatric pathology during the COVID-19 pandemic.

This study is necessary because there have been claims of a potential psychiatric epidemic concurrent with the COVID-19 pandemic, which attracted the attention of the global health community(320) and, therefore, my interest in researching completed suicide in Sibiu County in previously known patients with pre-existing psychiatric pathology.

Specific objectives: to analyze the main suicide risk factors (gender, age, background, marital status, nationality, religion, education level, economic activity, place of suicidal act, seasonality of suicidal act, monthly variability of suicidal act, day of the week of suicidal act); analysis of the type of mental disorder, associated somatic pathology, presence of personal suicidal history, possible suicidal motives, highlighting of behavioral changes - by tracking the emergence of fifteen signs with the value of alarm signals; identification of suicidal methods; highlighting the role of acute alcohol consumption; drawing up the 'profile' of the psychiatric patient with maximum risk of emergence of a suicidal act, for both periods analyzed.

II.3.3. Material and method

In this study, we conducted an epidemiological investigation comprised of two components: a retrospective component (data for 2018-2019) and a prospective component (data for 2020-2021).

The study material was provided by the case files pertaining to suicides of persons with a psychiatric history from Sibiu County and who were autopsied at the Forensic Department of

Sibiu County in the 2018-2021 timeframe. The registers of admissions showed that the victims had a record of psychiatric pathology within the archives of the Clinical Hospital of Psychiatry 'Dr. Gh. Preda' Sibiu.

The methodology used included: analysis of the forensic autopsy registers from the archives of the Forensic Department of Sibiu County (through which we identified cases of suicide); analysis of toxicological registers (we extracted data on the toxicological examinations carried out, including alcohol); analysis of medical certificates of death (gender, age, nationality, religion, level of education, economic activity and marital status); analysis of the medical and legal autopsy reports (we extracted and double checked the data on gender, age, nationality, religion, level of education, economic activity, marital status and blood alcohol level, as well as data on the suicide method chosen; for this study, we selected cases with documented psychiatric pathology for detailed analysis); analysis of the consult and of the admission registers within the 'Dr. Gh. Preda' Sibiu Clinical Psychiatric Hospital (we obtained confirmation of the psychiatric history of those who committed suicide); analysis of the general clinical observation sheets (including the analysis of psychological bulletins made during consultations/admissions) from the archive of the 'Dr. Gh. Preda' Sibiu Psychiatric Hospital (we obtained the relevant data on suicidal risk factors, possible reasons for suicide, as well as behavioral changes).

For the systematic collection of this information, we followed: thirteen possible reasons for suicide: (1) intimidation victim/terrorization in any way; (2) school problems; (3) emotional problems; (4) family conflicts; (5) conflicts with other people; (6) material problems (debts); (7) death or illness of a close person; (8) own illness or infirmity; (9) loss of a job; (10) professional failures; (11) legal problems; (12) problems with their sexual life; (13) other reasons (including the COVID-19 pandemic), as well as fifteen warning signs of suicide risk: (1) communication of suicidal ideation; (2) sadness; (3) tendency to isolation; (4) anxiety; (5) aggression; (6) nervousness; (7) insomnia; (8) chronic fatigue; (9) lack of participation in family life; (10) lack of participation in social life; (11) feelings of worthlessness; (12) feelings of guilt; (13) feelings of inferiority; (14) lack of self-confidence; (15) loss of interest in life. We extracted the premonitory signs recorded on the first admission of the psychiatric patient, to be able to make judgments on the behavior of suicidal persons in the distant past, as well as those from the last admission, with the aim of scoring the possible emergence of new premonitory signs or the intensification of existing ones, and to analyze the behavioral evolutionary trends.

Common, specific, and exclusion criteria, data confidentiality, and statistical analysis were carried out according to the general methodology outlined.

II.3.4. Results

The second study included all cases of suicide registered in the 2018-2021 period, in Sibiu County, in persons with a documented psychiatric history in the 'Dr. Gh. Preda' Sibiu Clinical Psychiatric Hospital.

Following data collection and statistical processing (according to the general methodology), we have presented the results obtained on the main suicide risk factors in detail (by gender, age,

background, marital status, nationality, religion, education, economic activity, place of suicide, seasonal variability, monthly variability, day of the week, suicide method, autopsy alcohol level). In this study, we extended the analysis of suicidal risk factors and extracted and analyzed data on the main mental illness, number of mental illnesses, number of admissions and days of hospitalization; associated organic pathology; presence/absence of suicide attempts, and their number in personal history; we highlighted possible suicidal motives and behavioral changes (investigated using the mentioned instruments).

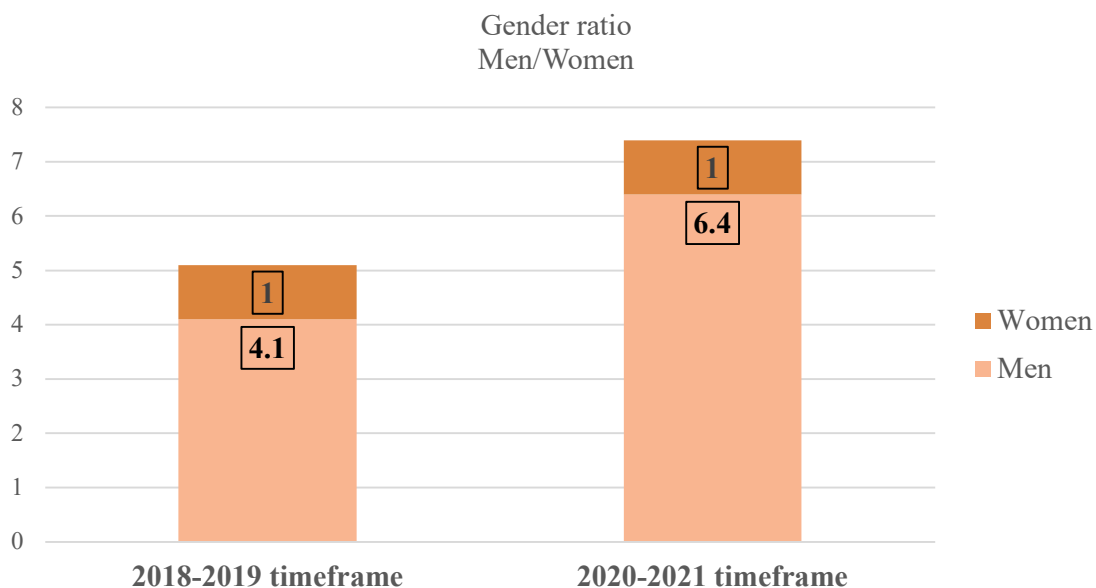
II.3.5. Discussions

Out of 189 cases of suicide autopsied during the 01 January 2018 - 31 December 2021 period (104 in the pre-pandemic period and 85 during the pandemic), 78 cases (41.27%) were registered in the records of the 'Dr. Gh. Preda' Sibiu Clinical Hospital of Psychiatry, including 41 cases in the 2018-2019 period and 37 cases in the 2020-2021 period. The suicide case percentage increased from 39.42% before the pandemic to 43.53% during the pandemic.

By comparing the characteristics of suicidal risk factors with the pre-pandemic COVID-19 timeframe, we were able to highlight the changes that occurred in the context of the COVID-19 pandemic in suicidal individuals with a documented psychiatric history.

- During the COVID-19 pandemic, the proportion of suicides recorded in men increased from 80.48% (33 cases) to 86.48% (32 cases) during the pandemic period. Among women, there was a decrease in the number of cases during the COVID-19 pandemic period (from 8 cases (19.52%) to 5 cases (13.52%)), with a clear downward trend in the 2020-2021 interval. Consequently, the M/F gender ratio increased from 4.1:1 in 2018-2019 to 6.4:1 in 2020-2021, as shown in figure no. 4

Figure no. 4 - Graphical representation of the male-to-female ratio (gender ratio M/F) in patients with psychiatric history who committed suicide; Sibiu County; 2018-2019, 2020-2021



- During the COVID-19 pandemic, the number of suicide cases, i.e. the percentage, increased in the following age groups: 25-29 years (3 cases - recorded only during the pandemic), 45-49 years (from 14.63% in 2018-2019 increased to 18.91% in 2020-2021) and 60-64 years (from 7.31% in 2018-2019 increased to 16.21% in 2020-2021).

- The urban/rural environment over the two investigated periods showed differences in the number of suicide cases and their percentage, with a clear decrease in the urban environment, from 30 cases (73.17%) to 22 cases (59.45%). There was an increase in the number and percentage of suicide cases in the rural environment, from 26.83% (11 cases) in the period 2018-2019 to 40.54% (15 cases) in the period 2020-2021.

- The anomic marital status role (unmarried, divorced, widowed) as an important suicide risk factor is also documented in this study. Thus, in these categories of people, an increase was noted during the pandemic, from 25 cases (60.98%) during 2018-2019 to 29 cases (78.38%) during 2020-2021. Unmarried people were the most vulnerable (although there were minimal differences between the periods studied). We found larger differences in the other categories of abnormal marital status, in terms of increased suicidal risk during the COVID-19 pandemic in divorced persons (from 6 cases - 14.63% in the 2018-2019 period to 8 cases - 21.62% in the 2020-2021 period) and widowed persons (from 3 cases - 7.32% in the 2018-2019 period to 6 cases - 16.22% in the 2020-2021 period).

The protective role of the family was suggested by the fact that the number of cases and the percentage of married psychiatric patients decreased in the context of the COVID-19 pandemic, from 16 cases (39.02%) in 2018-2019 to 8 cases (21.62%) in 2020-2021.

- The majority of the suicide victims were of Romanian nationality and Orthodox religion, in the context that in Sibiu the majority of people are of Romanian nationality and the Orthodox religion is predominant.

- Differences between periods were noted: in people with a vocational school education (18 cases of suicide, 43.90% in the 2018-2019 period as compared to 10 cases, 27.03% in the 2020-2021 period); in people with 9 to 12 grades of education (with a minimal increase from 26.83% in the 2018-2019 period to 29.73% in the 2020-2021 period); in people with higher education, from 3 cases (7.32%) in the 2018-2019 period increased to 7 cases (18.92%) during the COVID-19 pandemic.

- The difference between the selected periods, in the sense of an increase in the percentage, was observed in the retired category, which increased from 43.90% (18 cases) in the 2018-2019 period to 51.35% (19 cases) in the 2020-2021 period, but also in the case of the category 'without occupation', in the sense of a decrease from 13 (31.70%) in the 2018-2019 period to 6 (16.22%) in the 2020-2021 period.

- The place of the suicidal act shows great differences between the two analyzed intervals. Thus, in the 2018-2019 timeframe in more than half of the cases (22 cases; 53.65%) the suicidal act was carried out in public places and only 34.15% (14 cases) was carried out in the home. During the COVID-19 pandemic, possibly due to the imposed movement restrictions and quarantining,(312) the number and percentage of those who committed suicide at home increased (to 26 cases; 70.27%).

- Differences between the timeframes were observed in spring when the number of suicide cases decreased from 16 cases (39.03%) in 2018-2019 to 10 cases (27.03%) in 2020-2021. An increase in suicides was observed during summer, from 7 cases (17.07%) to 11 cases (29.73%).

- During the COVID-19 pandemic, October was the month with the most suicides (6 cases; 16.21%), but also March, May, June, and July (4 cases each; 10.81). We did not note significant changes between the pre-pandemic and the pandemic intervals in terms of the distribution of cases by month.

- Comparative analysis revealed that the frequency of suicides during 2020-2021 increased on Mondays (to 9 cases; 24.33%) and decreased on Fridays (to 6 cases; 16.21%).

- The preferred method of suicide was hanging, both in the pre-pandemic timeframe and during the COVID-19 pandemic. During 2018-2019 the second most preferred method was drowning, with 6 cases (14.64%), a suicide method that was not found during the pandemic period, possibly due to movement restrictions. Poisoning, which ranked third before the pandemic (3 cases; 7.32%), decreased to only one case (2.70%) during the pandemic. In contrast, the number of cases of suicide by jumping from heights increased in the 2020-2021 period (5 cases; 13.52%) compared to the 2018-2019 period, when there were only two cases (4.87%).

- In 2018-2019 acute alcohol consumption was found in only 13 of the 37 cases with documented blood alcohol values (35.14%). Most cases (10 cases; 27.03%) had blood alcohol values in the intervals 0.01-0.5 g‰ and 1.01-2.5 g‰. During the COVID-19 pandemic, acute alcohol consumption was found in only 12 of the 33 cases (36.36%) using alcohol tests. We found alcohol values in the range of 0.01-1 g‰ in most cases of suicide (7 cases; 21.21%). The findings are consistent with the literature, which states that acute alcohol consumption is less frequent a factor in the transition to self-harm of psychiatric patients(3).

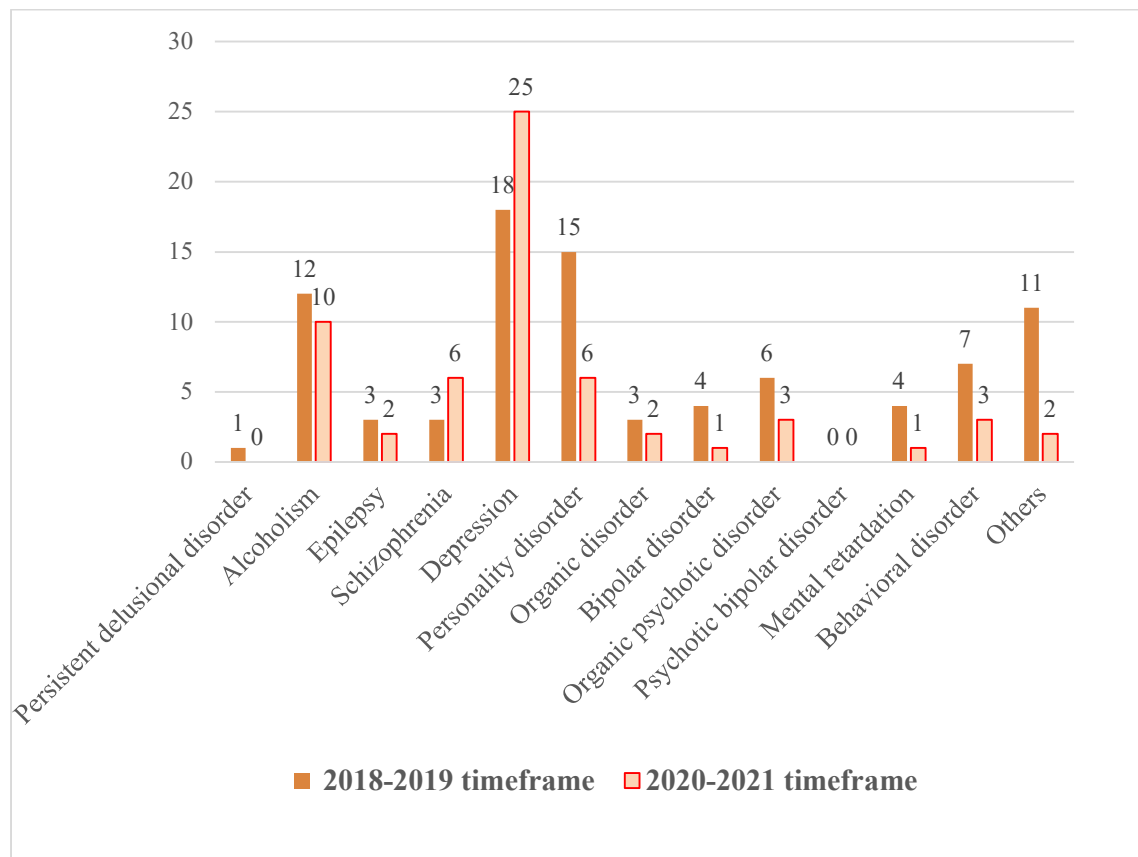
- Individuals with a single psychiatric diagnosis recorded in the general clinical observation sheets increased from 14 cases (31.14%) in 2018-2019 to 22 cases (59.45%) during the COVID-19 pandemic. The number of suicide cases and the percentage of psychiatric patients, who had two or more associated diagnoses, decreased during the COVID-19 pandemic – as compared to the pre-pandemic interval, from 27 cases (65.85%) to 15 cases (40.54%).

- During the COVID-19 pandemic, patients known to suffer from depression (including bipolar affective disorder) were most at risk of suicide; their number and proportion increased from 22 cases (53.66%) to 26 cases (70.27%).

At the same time, during the COVID-19 pandemic, an increase in the number of suicide cases in patients with schizophrenia was recorded, from 3 cases (7.31%) in 2018-2019 to 6 cases (16.22%) in 2020-2021.

People with a diagnosis of alcoholism had an increased suicide risk in both periods studied, but there was a decrease from 12 cases (29.27%) in 2018-2019 to 10 cases (27.03%) in 2020-2021. Decreases in the number of suicide cases and their percentage during the pandemic period were more evident among people with personality disorders, from 15 cases (36.58%) in 2018-2019 to 6 cases (16.22%) in 2020-2021 (Figure no. 5).

Figure no. 5 - Graphical representation of suicides according to the main mental disorders recorded in the clinical observation sheets, during admissions/consultations in the 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital; 2018-2019, 2020-2021



- In both periods studied, most suicides occurred in people who had up to 5-lifetime admissions. Comparative analysis of the pre-pandemic period with that of the COVID-19 pandemic revealed an increase in the proportion of psychiatric patients who had less than 20 days of hospitalization, possibly in the context of the COVID-19 pandemic, from 29.26% (12 cases) to 48.65% (18 cases).

- During 2018-2019, cardiac pathology (29 cases; 70.73%), neurological pathology (15 cases; 36.58%), and liver pathology (7 cases; 17.07%) were found to be the most frequently recorded in the general clinical observation sheets. During the COVID-19 pandemic, cardiac (17 cases; 45.94%) and neurological conditions (14 cases; 37.84%) remained in the top two places, followed this time by urogenital pathology (8 cases; 21.62%). Neoplastic diseases, known to induce an increased risk of suicide, in the sense that any organic disease can lead to suicidal ideation, resulting in suicide, (58,59,60,66) were rarely encountered in case studies (one case each of multiple myeloma, operated testicular cancer, and bronchopulmonary cancer with pleural metastases).

- In the 2020-2021 period, compared to the 2018-2019 period, there was an increasing number of suicide attempts in the antecedents (from 14 cases - 34.15% in the 2018-2019 period to 17 cases - 45.95% in the period between 2020-2021). Comparative analysis of the pre-

pandemic and pandemic timeframes did not reveal significant differences in the number of suicide attempts.

- Comparing the pre-pandemic period with that of the COVID-19 pandemic, an increasing number of the following possible reasons for suicide were observed: sentimental problems, from 2 cases (4.87%) in 2018-2019 to 8 cases (21.62%) in 2020-2021; material problems, from no cases in 2018-2019 to 7 cases (18.91%) in 2020-2021; death or illness of a close person, from 6 cases (14.63%) in 2018-2019 to 13 cases (35.13%) in 2020-2021; job loss, from no cases in 2018-2019 to 3 cases (8.11%) in 2020-2021; legal problems, from 4 cases (9.75%) in 2018-2019 to 8 cases (21.62%) in 2020-2021.

- The comparative analysis of the 2018-2019 period with the 2020-2021 period (the COVID-19 pandemic period) revealed the following differences between the symptoms presented on first admission and last admission, as peculiarities that occurred in the context of the COVID-19 pandemic: communication of suicidal ideation, which for those who died in the pre-pandemic period shows a decrease from the first to the last admission (from 12 cases - 29.26% to 3 cases - 7.31%), has increased (from 14 cases - 37.83% to 16 cases - 43.24%) for those who died during the pandemic; anxiety (from 33 cases - 80.48% to 26 cases - 63.41%), increased (from 20 cases - 54.05% to 28 cases - 75.67%) for those who died during the pandemic; loss of interest in life (from 8 cases - 19.51% to 19 cases - 46.34%), increased (from 6 cases - 16.21% to 26 cases - 70.27%) for those who died during the pandemic; lack of participation in family life (from 11 cases - 26.82% to 2 cases - 4.87%), increased (from 10 cases - 27.02% to 35 cases - 35.13%) for those who died during the pandemic; lack of participation in social life (from 10 cases - 24.39% to 2 cases - 4.87%), increased (from 10 cases - 27.02% to 12 cases - 32.43%) for those who died during the pandemic. The mentally ill were confronted with both the illness and the psycho-emotional implications of the pandemic, which triggered, and in some cases worsened suicidal ideation resulting in completed suicide.

Our study identified the psychopathological variations of people with psychiatric illnesses in Sibiu County, as well as factors associated with mental health problems in these patients who committed suicide during the pandemic versus the pre-pandemic period, in order to better understand the psycho-emotional challenges and implications, as well as the psychiatric disorders that emerged or were accentuated during the COVID-19 pandemic. Data suggests that there will be broader, long-term, and perhaps unexpected consequences of the COVID-19 pandemic, comparable to a psychiatric epidemic, which require the attention of the global health community(322,323,324).

Through the data provided by the second study, we have outlined the 'profile' of psychiatric patients who resorted to lethal suicide in the two periods analyzed.

The 'profile' of the person with a history of mental illness who committed suicide in 2018-2019 (pre-pandemic period): male; age group: 45-49 years, 65-69 years or 50-54 years; urban environment; anomic marital status (single, divorced, widowed); Romanian nationality; Orthodox religion; education level: vocational school, high school education, between 5 and 8 grades; retired, unemployed, employed (in descending order); place of the suicidal act: in public places, at home; suicidal act occurs in spring (March, April, May) or autumn (September,

October, November); suicidal act occurs on Friday, Saturday; suicidal methods: hanging, drowning, intoxication; acute alcohol consumption prior to the suicidal act, with blood alcohol levels between 0.01 and <0.5 g‰, 1.01-2.5 g‰; known depressive episode (major or moderate), personality disorder, alcoholism, conduct disorder or organic psychotic disorder; known to have one/two or more psychiatric diagnoses; less than 5 psychiatric admissions; less than 50 days admission in the psychiatric ward; suffering from organic disorders: cardiac, neurological, hepatic or osteoarticular pathology; with one or more suicide attempts in their personal history; possible suicidal motives: own illness or infirmity; family conflicts; death/illness of a close person; conflicts with other people; legal problems; with symptoms suggesting depression (insomnia, tendency to isolation, sadness, restlessness, loss of interest in life, chronic fatigue) and decreased aggressive-type behavior (decreased aggressiveness and nervousness) during the last admission.

During the COVID-19 pandemic period, the characteristics change partially.

The 'profile' of the person with a history of mental illness who committed suicide in the period 2020-2021 (pandemic period): male; age group: 45-49 years, 60-64 years; urban environment, but with a high probability of rural environment; anomic marital status (single, divorced, widowed); Romanian nationality; religion: Orthodox; level of education: high school, vocational school, education between 5 and 8 grades, higher education; retired, employed or unemployed (in descending order); place of suicidal act: at home; suicidal act occurs in summer (June, July), spring (March, May), autumn (October); suicidal act occurs on Monday; less often on Thursday or Friday; suicidal methods: hanging, precipitation; with acute alcohol consumption before the suicidal act, with blood alcohol levels between 0.01- 1 g‰ or 1.51- 2 g‰; known to have suffered from depressive episodes (moderate or major), alcoholism, schizophrenia, personality disorder; usually registered with one psychiatric diagnosis; less than 5 admissions to the psychiatric ward; less than 20 days in psychiatric ward; with organic disorders: cardiac, neurological, hepatic or urogenital pathology; with one or more suicide attempts in their personal history; possible suicidal motives: own illness or infirmity; family conflicts; death/illness of a close person; sentimental problems, legal problems, material problems; with depressive-type symptoms (restlessness, loss of interest in life, insomnia, sadness, tendency to isolation, chronic fatigue); communication of suicidal ideation; with decreased aggressive-type behavior (decreased nervousness and aggressiveness).

II.3.6. Conclusions

The second study in the research focused on the assessment of suicidal individuals with a documented history of mental illness - a recognized risk factor for the emergence of suicide with a lethal outcome. We considered psychiatric patients known to the 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital, who committed suicide in the 2018-2021 period, trying to capture the evolutionary trends and peculiarities of suicide in psychiatric patients during the COVID-19 pandemic period (2020-2021), by comparing them with the pre-pandemic period (2018-2019).

Of the total 189 suicides in 2018-2021, 78 (with a significant percentage of 41.27%) were recorded in subjects with a documented psychiatric history. In the pre-pandemic period, there were 41 cases, with a percentage of 39.42%, and in the COVID-19 pandemic period, we registered 37 such cases, with an increasing percentage of 43.53%.

The analysis of these cases revealed the following:

- During the COVID-19 pandemic, the percentage of the male gender increased and the M/F gender ratio increased.
- In 2018-2019 most cases were in the 45-49, 65-69, and 50-54 age groups. In the 2020-2021 period, we have observed an increase in the percentage held by the 45-49 age group and an increase in the number of cases and percentage in the 60-64 age group.
- Cases from the urban environment have been declining sharply during the pandemic period. Consequently, we have observed a significant increase in rural cases in the context of the COVID-19 pandemic.
- In the context of the COVID-19 pandemic, anomic marital status has been shown to confer additional vulnerability for psychiatric patients, as demonstrated by the increase in the number and percentage of people in the abnormal status category from 25 cases (60.98%) in 2018-2019 to 29 cases (78.38%) in 2020-2021. In particular, the divorced or widowed were found to be more vulnerable. In contrast, married people showed decreases in number and percentage in the context of the COVID-19 pandemic, attesting to the protective role of the family, including during the pandemic crisis.
- The majority of cases were registered in Romanian and Orthodox people (both predominant in Sibiu County), with no major differences between the two periods analyzed.
- During the COVID-19 pandemic we noticed a decrease in the number of vocational school graduates. In contrast, an increase in those with tertiary education was apparent.
- During the pandemic period, we noted an increase in the number of cases and the percentage in the retired category; in contrast, we noted a decrease in the 'unemployed' category during the 2020-2021 period.
- During the COVID-19 pandemic there was a significant increase in suicides recorded at home. Correlatively, there was a significant decrease in suicides in public places between 2020-2021. The number of suicides in hospitals remained relatively constant during the pandemic period, but with a slight increase in their percentage.
- In the context of the COVID-19 pandemic, the seasonal variability changed, with a decrease in the number of suicide cases recorded in spring; an increase in suicide cases was observed in summer (especially in June). However, we found no statistically significant variability in terms of seasonality or monthly distribution.
- In the 2020-2021 timeframe we noted an increase in suicides on Mondays (from 6 cases - 14.64% to 9 cases - 24.33%) and a decrease in suicides on Fridays (from 9 cases - 21.95% to 6 cases - 16.21%). None of these variations had statistical significance.
- The preferred method of suicide was hanging, with an increase in the proportion during the pandemic period (from 65.86% in 2018-2019 to 75.68% in 2020-2021). During the COVID-

19 pandemic, we noted an increase in the proportion and number of cases of suicide by jumping from heights; this method became the second most frequent method of suicide.

- Acute alcohol consumption has also been shown to be a major factor in people with a history of psychiatric problems becoming suicidal. During the COVID-19 pandemic, there were no notable changes, although acute ethanol intoxication was identified in a slightly higher percentage (36.36%) than in the pre-pandemic period (35.14%).

- During the COVID-19 pandemic, the highest suicide risk was for patients known to have suffered from depression. We also noted an increase in suicides in patients with schizophrenia. Individuals struggling with alcoholism had an increased suicide risk in both periods studied, but there was a decrease from 12 cases (29.27%) in 2018-2019 to 10 cases (27.03%) in 2020-2021. Decreases in the number of suicide cases and their percentage during the pandemic period were detected in people with personality disorders.

- More than half (42 cases; 53.85%) of psychiatric patients who committed suicide during 2018-2021 had two or more mental health conditions. However, during the COVID-19 pandemic, we found that those with a singular recorded psychiatric diagnosis were increasing.

- Three-quarters of those who committed suicide between 2018-2021 presented fewer than 5 psychiatric admissions. During the pandemic period, this category showed an increased percentage, from 68.29% in 2018-2019 to 81.09% in 2020-2021.

- Analysis of the length of admissions revealed that more than a third of those who committed suicide between 2018-2021 were psychiatrically hospitalized for less than 20 days. Comparative analysis of the pre-pandemic period with that of the COVID-19 pandemic revealed an increase in the proportion of these psychiatric patients in the context of the COVID-19 pandemic.

- During the COVID-19 pandemic, cardiac (17 cases; 45.94%) and neurological (14 cases; 37.84%) diseases remained in the top two places, followed this time by urogenital pathology (8 cases; 21.62%). Neoplastic diseases were rarely found in the studied case files.

- For those who committed suicide in 2020-2021, compared to those in 2018-2019, there was an increasing number of suicide attempts in the past.

- For those who committed suicide during the COVID-19 pandemic, we noted an increasing number of the following possible reasons for suicide: emotional problems, material problems, death or illness of a close person, job loss, and legal problems.

- The comparative analysis of the 2018-2019 period with the 2020-2021 period revealed differences between the symptoms presented on first and last admission for the following signs: communication of suicidal ideation; anxiety; loss of interest in life; lack of participation in family life; lack of participation in social life.

II.4. STUDY NO. 3: INVESTIGATION BY USING THE PSYCHOLOGICAL AUTOPSY METHOD OF THE SUICIDE CASES WITH LETHAL OUTCOME FROM THE CASUISTRY OF THE FORENSIC DEPARTMENT OF SIBIU COUNTY, IN THE PERIOD BETWEEN 2020-2021

II.4.1. Introduction

The psycho-emotional impact of the COVID-19 pandemic has been investigated and reported in scientific literature, through the impact on physical health and its socio-economic consequences.(279,302,320) By applying the psychological autopsy method, suicidal details are obtained in order to understand the motivation of the suicidal gesture and to be able to reconstruct and assess the psychological state of the person before the suicidal act ends in a lethal outcome.

II.4.2. Purpose and objectives

Even with the decrease in suicide cases during the COVID-19 pandemic, I felt it important to detail the suicide risk factors, the reasons leading to the completed suicide, and the behavioral changes prior to death, illustrating the enhancement of a certain type of behavior before the decision to complete the suicidal act.

The database obtained from the study will support the suicide prevention and prophylaxis programs in Sibiu County, by providing new details on the lethal suicide phenomenon during the COVID-19 pandemic, with the possibility of updating suicide prevention programs. In a pandemic context, suicide risk factors may undergo changes as compared to the usual psychological pattern, changes that can lead to the accentuation of suicidal behaviors, which can have both short-term and long-term consequences.

Specific objectives: Analysis of main suicide risk factors (gender, age, background, marital status, number and status of the children of the suicidal person, nationality/ethnicity, religion, education level, economic activity, profession, place of the suicidal act, seasonality of the suicidal act, monthly variability and day of the week of the suicidal act); identification of psychiatric and somatic pathology; identification of suicide attempts in family and personal history; highlighting the role of acute alcohol consumption as a factor in the transition to self-harm; obtaining additional details on the method of suicide; identifying the main reasons for suicide; identifying changes in behavior and outlining 'warning signs' in distant past, as well as new or intensified 'warning signs' prior to the suicidal act; identifying the 'profile' of the person at highest risk of committing the suicidal act during the COVID-19 pandemic.

II.4.3. Material and method

The study material was provided by the forensic case files, which included all suicide cases from the Forensic Department of Sibiu County (which also included the Mediaş Forensic Office). The study is a prospective study, covering the period from 1 January 2020 to 31

December 2021. As part of the psychological autopsy method, we administered a specially designed questionnaire used to capture as much data as possible about the psychological profile and suicidal specifics of the suicidal person's life.

The accuracy of the data obtained from the questionnaire was verified by analyzing the following documents related to the cases investigated: forensic autopsy registers and forensic autopsy reports (we extracted and verified data on gender, age, nationality, religion, education, economic activity, marital status, as well as data on blood alcohol levels, chosen suicide method and psychiatric and somatic pathology); medical certificates of death (we obtained and verified data on gender, age, nationality, religion, education, economic activity, and marital status).

Data pertaining to suicidal aspects were obtained by using a specially designed questionnaire, which was administered to persons close to the suicide victim (relatives, neighbors, acquaintances, friends, etc.). This questionnaire was structured in twenty sub-chapters and included questions related to the main suicide risk factors: gender, age, nationality, background, religion, level of education, economic activity, marital status; number and status of children; financial situation; date and place of death; alcohol consumption and possible substance abuse; psychiatric and/or somatic pathology; data on possible pregnancy; hetero-anamnestic information about the chosen suicide method; the existence of suicide attempts in personal and family history; suicidal motivation; behavioral changes in distant and recent history (immediately preceding the suicidal act); the existence of 'suicide note'. We noted the degree of kinship or social relationship between respondents and the person who committed suicide.

In order to acquire knowledge about the psychological profile of the suicidal person, a free, extensive discussion was used to outline the trajectory and life events, aimed at identifying the contributory role of the SARS-CoV-2 infection and the COVID-19| pandemic in the emergence of the suicidal act. Information was collected by free dialogue, coupled with empathic listening so that caregivers could openly speak about the suffering they had just experienced. During the discussions, we proceeded to complete the specially designed questionnaire.

The standardized questions (open, semi-open, and closed) in the questionnaire were designed to elicit information about suicidal motivation by choosing one or more of the following: (1) intimidation victim/terrorization in any way; (2) school problems; (3) emotional problems; (4) family conflicts; (5) conflicts with other people; (6) material problems (debts); (7) death or illness of a close person; (8) own illness or infirmity; (9) loss of a job; (10) professional failures; (11) legal problems; (12) problems with their sexual life; (13) other reasons (including the COVID-19 pandemic). We also tracked behavioral changes by highlighting fifteen potential 'warning signs', namely: (1) communication of suicidal ideation; (2) sadness; (3) tendency to isolate; (4) restlessness (as an indicator of anxiety); (5) aggression; (6) nervousness; (7) insomnia; (8) chronic fatigue; (9) lack of participation in family life; (10) lack of participation in social life; (11) feeling of worthlessness; (12) feeling of guilt; (13) feeling of inferiority; (14) lack of self-confidence; (15) loss of interest in life.

When interpreting the results obtained, only that data was taken into account which, after collection and statistical interpretation, provided essential and conclusive elements for the present research. Thus, the questions initially included in the questionnaire, but for which no

correspondence was identified (for example the question 'was the deceased person pregnant?', 'in which month?', and other data), were no longer presented in the chapter 'Results' and were not interpreted.

The questionnaire applied has been reproduced in the doctoral research work. Respondents were assured of the confidentiality of the data (both of the deceased and the relatives) and that data processing will provide the framework of research on the phenomenon of suicide with lethal outcomes. Data collection was only carried out after obtaining the consent of the relatives, who could ask questions if they had any concerns. Participation in this study did not involve any risk to respondents. The confidentiality of the data obtained was strictly respected throughout the scientific research and after its completion, in accordance with laws and regulations pertaining to national data protection.

The common, specific, and exclusion criteria (by which we selected the subjects to be included in the present study), as well as the statistical-mathematical analysis, were performed according to the general methodology outlined.

II.4.4. Results

The third study included all cases of suicide (85 cases) in Sibiu County, registered in the 2020-2021 period at the Forensic Department of Sibiu County (which included Mediaş Forensic Office).

In this chapter we have presented the detailed results of the analysis: the main suicide risk factors - by gender, age, urban/rural environment, marital status, number of children of the suicidal person, nationality, religion, level of education, profession, economic activity, personal monthly income, total monthly income of the persons with whom the suicidal person lived, place where the suicidal act occurred, seasonal variability, monthly variability, day of the week, suicidal method, frequency of alcohol consumption reported by respondents as well as preference for a specific alcoholic beverage, existence/absence of reported psychiatric pathology, associated somatic pathology, reported presence or absence of suicide attempts in the personal history, presence or absence of suicide attempts in the family of the suicidal person, suicidal motivation, presence of more than one suicidal motive/suicide, presence/absence of the suicide note, presence of the 15 warning signs investigated; we also presented data on quality (degree of kinship) of the person to whom questionnaire was administered.

II.4.5. Discussions

The psycho-emotional impact of the COVID-19 pandemic, in addition to the immediate consequences, may also have long-term consequences,(306) therefore knowledge about the suicide risk factors during the COVID-19 pandemic can make a substantial contribution to the development of suicide prevention measures.

The psychological autopsy method is one of the most valuable tools for suicide research(234) Accordingly, we administered a specially designed questionnaire (as an integral part of the psychological autopsy method) and obtained data pertaining to suicidal data, mainly from key

informants,(239) related to the main suicide risk factors, suicidal motivation, and behavioral changes.

During the COVID-19 pandemic, 85 suicides were recorded in Sibiu County, from 1 January 2020 to 31 December 2021, which were analyzed in order to outline the 'profile' of the person at maximum risk of suicide, whose portrait is made up of the main suicide risk factors presented below:

- Suicidal risk is clearly in favor of the male gender,(281,282) an aspect also detected in the case studies analyzed, with a higher number of cases and a much higher percentage of male cases (76 cases; 89.41%) than female cases (9 cases; 10.59%). The higher vulnerability of the male gender is also suggested by the gender ratio M/F that in the 2020-2021 period was 8.44:1. with variations in wider limits between the years studied (in 2020 it was 6.6:1, and in 2021 the gender ratio M/F increased to 10.75:1). These aspects could suggest possible long-term negative consequences of the COVID-19 pandemic (306).

- In the 2020-2021 period, the most frequent cases of suicide were found in the age groups between 60-64 years (14 cases; 16.47%) and 45-49 years (11 cases; 12.94%). We noted a higher vulnerability of people aged 60-74 years (29 cases; 34.12%). We noted a statistically significant difference between the average age in women and the average age in men ($p=0.0454<0.05$), which was 40.67 in women and 55.88 in men.

- In the 2020-2021 period, in the context of the high urbanity of Sibiu County, it was expected that the urban environment would present a higher number of suicide cases (47 cases; 55.30%).

- The increased suicide risk in people with abnormal marital status (unmarried, divorced, widowed) is also observed during the COVID-19 pandemic, through the high number and percentage of people who committed suicide and were of this status. Most affected were unmarried people (27 cases; 31.77%). Divorced people (from 4 to 12 cases; 10.52% to 25.54%) and widowed people (from 5 to 8 cases; 13.16% to 17.02%) in particular were found to be vulnerable in the long term, with increases in number and percentage in 2021. The protective role of the family is demonstrated by the fact that in 2020-2021 we recorded only 29 cases (34.11%) in married people. This protective role also seems to exist for the long-term effects of the pandemic, suggested by a downward trend in suicides among married people in the second year of the pandemic (from 16 cases - 42.10% in 2020 to 13 cases - 29.79% in 2021).

- The application of the questionnaire allowed the investigation of additional suicide risk factors to the investigation methods already described. Thus, we were able to find that 29 (34.12%) of those who committed suicide between 2020-2021 did not have children.

- The majority of the suicides analyzed were among Romanian nationals (75 cases; 88.23%), as expected in the context of the majority of Romanian nationality in Sibiu County. However, there were also cases of other nationalities: Hungarian - 4 cases (4.70%); German - 3 cases (3.53%); Belgian - 1 case (1.18%); 2 Roma (2.36%).

- During the COVID-19 pandemic, most suicides (73 cases; 85.88%) occurred among people of the Orthodox religion, which is natural, given that the Orthodox religion is the majority in Sibiu County. There were cases belonging to other religions (apart from the

Orthodox one), as follows: 4 cases (4.70%) of Evangelical religion; 3 cases (3.52%) of Greek-Catholic, 2 cases (2.36%) of Roman Catholic and Pentecostal religion; 1 case (1.18%) of Baptist religion.

- In the 2020-2021 period, the highest number of suicides was found among those with secondary school education (24 cases; 28.24%), followed by those with 5 to 8 grades and those who completed vocational school (each with 22 cases; 25.89%). Thus, the vast majority of those who committed suicide during the pandemic period had a medium level of education (60 cases; 80.00%). Those with tertiary education accounted for a minimal percentage (7 cases; 8.23%).

- People in the 'no profession' category have a high suicide risk, documented in the present study by the high proportion of suicides in this group (21 cases; 24.70%). In addition, an occupational category at high risk during the COVID-19 pandemic was the unskilled workers' group (9 cases; 10.59%). We also registered mechanical locksmith (7 cases; 8.23%), engineer, driver, and foreman (4 cases each; 4.71%).

- The highest number of suicide cases was recorded among pensioners (39 cases; 45.88%) and unemployed (18 cases; 21.17%), attesting to the increased suicide risk in these vulnerable groups, also described in the literature (3).

- The questionnaire provided additional data on the income of those who committed suicide. From the analysis of the monthly personal income, we observed that the highest frequency of suicide cases was found among those whose income was between 1500 and 3000 lei (34 cases, 40.00%), followed by those whose income was lower, between 100 and 1500 lei (28 cases; 32.94%). At the extremes, there were 8 cases (9.41%) who had an income above 3000 lei; but also quite a large number of 15 cases (17.65%) who had no income. Overall, more than half of those who committed suicide had a personal income below 1500 lei/month (43 cases; 50.58%).

Investigation on the total amount of the monthly family income, related to the number of family members, showed similar patterns: the highest frequency of suicides was found among those whose family income was between 1500 and 3000 lei/family member (37 cases, 43.53%), then among those with incomes between 100 and 1500 lei/member (30 cases; 35.29%). In almost half of the cases (39 cases; 45.88%) this income was below 1500 lei/month. Only 9 cases had a family income per family/member above 3000 lei/month. Low income is an increased suicide risk factor, especially if other risk factors are concomitant (3). This risk may be increased under the COVID-19 pandemic conditions due to the socio-economic implications arising from the COVID-19 pandemic.

- According to the respondents' statements, corroborated with objective forensic data, during the COVID-19 pandemic most cases of suicide occurred at home (60 cases; 70.59%). In 12 cases (14.12%) the suicidal act took place in public places and in 13 cases (15.29%) in hospitals. The much higher frequency of suicides at home can be attributed to the COVID-19 pandemic, as social distancing, isolation, quarantine, and movement restrictions were imposed.(10) According to data from specialized literature, the place of death in about three-quarters of the cases was at the person's home and only a small proportion (about 10%) of suicides occurred in controlled environments such as hospitals.(314)

- Summer (28 cases; 32.95%) was the season with the most cases of completed suicides during the COVID-19 pandemic.

- As for the rest of the seasons (spring, winter, autumn), each comprised 19 cases (22.35%) of completed suicides. July and August (each with 11 cases; 12.94%) were the months with the most cases of completed suicide during the COVID-19 pandemic.

- Most suicides occurred on Mondays (20 cases; 23.53%), followed by Saturdays (13 cases; 15.29%), then Fridays and Sundays with 12 cases (14.12%) each.

- Hanging is by far the most frequently used method of suicide in Sibiu County,(3) and in Romania.(14,15) In the present study we also found a clear prevalence of hanging (64 cases; 75.29%), including during the pandemic period. However, we also noted 8 cases (9.42%) of suicide by jumping from heights, which ranked second as a suicide method. There were also 3 cases (3.52%) by self-inflicted burns, 2 cases (2.35%) by poisoning, and also by other methods of asphyxiation by lack of O₂ and one road traffic event. We registered cases of completed suicide by harsh and/or atypical suicide methods: self-inflicted burns, road traffic events, and self-hitting against blunt objects. The use of these 'harsh' methods denotes a strong desire to commit suicide.

- The application of the questionnaire provided interesting data on alcohol consumption among those who committed suicide. Since the link between alcohol and suicide is specified in literature,(201) we also interviewed the caregivers on their drinking habits. Alcohol consumption (as reported by respondents) during the COVID-19 pandemic was identified in more than half (58 cases; 68.24%) of those who committed suicide. More than a third (29 cases; 34.12%) consumed alcohol on a daily basis. In this context, it is worth noting that, in the second study, based on the information provided by the studied observation sheets, we identified the diagnosis of alcoholism in only 10 of the 85 suicides (11.76%) in the 2020-2021 period. Thus, we can conclude that the application of the questionnaire provides additional information about the role of chronic alcohol consumption in suicidal genesis by identifying potentially underdiagnosed cases of chronic alcoholism. Moreover, one-third (29 cases; 34.12%) consumed any kind of alcohol, and 14 (16.47%) of them consumed spirits; 9 (10.59%) of them consumed wine.

- Relatives' statements showed that 39 of those who committed suicide (45.88%) were known to have suffered from psychiatric pathology. Although the vast majority of the relatives did not know the exact diagnosis, they nevertheless specified the number of patients with psychiatric pathology quite accurately, because, according to the data from the second study, we highlighted 37 people (43.53%) who committed suicide during the COVID-19 pandemic who had consultations or admissions in the Clinical Psychiatric Hospital 'Dr. Gh. Preda' Sibiu, which led to a psychiatric diagnosis. The data proves that the application of the questionnaire, as an integral part of the psychological autopsy method, brings data very close to reality, which is extremely important in a context where literature suggests that many of those who commit suicide have been previously diagnosed with a mental illness(291).

- In most cases of suicide, a pre-existing somatic pathology was reported (48; 56.47%); we were able to correlate this information with necropsy data. The most common pathologies were

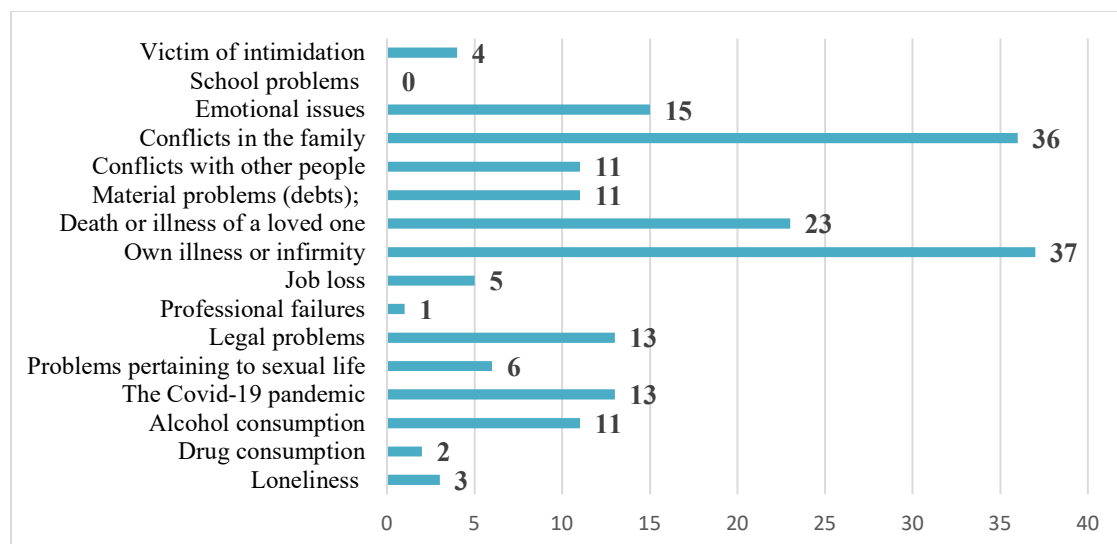
cardiac (9 cases), urogenital (7 cases), and hepatic (4 cases). It should be noted that in 6 cases (7.06%) the SARS-CoV-2 infection was reported.

- In 57 cases (67.06%) the respondents did not report any previous suicide attempts. However, in one-third of the cases (28 cases; 32.94%) relatives reported suicide attempts in the personal history of the suicidal person. Of these, 23 (82.14%) reported only one suicide attempt (by hanging - 11 cases; self-inflicted wounds - 6 cases; poisoning - 5 cases; rail traffic event - one case), and 5 (17.86%) of those who committed suicide during 2020-2021 were known to have had two or more suicide attempts in their personal history. The information provided by relatives (related to the 28 cases with suicide attempts in their history) was correlated with the data obtained in the second study from the general clinical observation sheets of 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital, in which suicide attempts were recorded in only 17 (20.00%) of the cases of suicide with lethal outcome during the COVID-19 pandemic. Thus, we can affirm that the application of the questionnaire can provide information on suicide attempts that did not reach the attention of mental health professionals, these suicide attempts being stopped in time by the caregivers, without later seeking specialized psychiatric and psychological help.

- For 65 cases (76.47%) the relatives did not report any suicide attempt in the family history of the persons who committed suicide. However, in 20 cases (23.53%) the relatives of the suicide victims reported such attempts. In 12 cases (14.12%), suicide attempts in the family were among close relatives: 6 cases - brothers, sisters; 3 cases - parents; 2 cases - first cousins; 1 case - grandparents).

- Relatives of people who have died by suicide have made a substantial contribution to identifying the motivation for the suicidal act. In descending order, the following reasons for suicide were reported: own illness or infirmity (37 cases; 43.53%), family conflicts (36 cases; 42.35%), death or illness of a close person (23 cases; 27.06%), emotional problems (15 cases; 17.65%), legal problems (13 cases; 15.29%), the COVID-19 pandemic (13 cases; 15.29%) (Figure no. 6).

Figure no. 6 - Graphical representation of suicidal motivation; Sibiu County; 2020-2021



- We also noted that in 44 of the cases, (51.76%) there were two or three suicidal reasons, and in 12 cases (14.12%) more than four suicidal reasons were reported. Multiple motivation was thus present in almost two-thirds of suicides during the pandemic period (56 cases; 65.88%), suggestive of the multifactorial determinism of suicide, particularly in the context of the COVID-19 pandemic. Literature also supports that the COVID-19 pandemic was associated with the occurrence of suicidal ideation and attempts as a result of experiences during the COVID-19 pandemic (276).

- The 'suicide note' is a document that directs the forensic investigation towards suicide, specifies the suicidal motivation, and confirms the firm suicidal intention.(3) The existence of a 'suicide note' was reported in 14 cases (16.47%). The others (71 cases; 83.53%) presented no 'suicide note', the forensic investigation being the one that established the cause of death. The psychological autopsy contributed to the assessment of the psychological framework of the individuals for labeling the cases as suicide, especially when there was no suicide note, as also stated in the literature (241,275,328,329).

- The questionnaire included 15 signs, characteristic of the existence of a depressive syndrome, and respondents were asked to specify which of these signs the person who committed suicide showed, both in the distant past (in general) and in recent history immediately before the death.

The most common warning signs (in descending order) in the distant past were: Nervousness - 41 cases (48.24%); restlessness - 33 cases (38.82%); sadness - 32 cases (37.65%); insomnia 32 cases (37.64%); aggressiveness 31- cases (36.47%); communication of suicidal ideation - 31 (36.47%); tendency to isolation - 27 cases (31.76%); lack of participation in social life - 20 cases (23.53%); feelings of worthlessness - 20 cases (23.53%).

As for the presence of the same 15 signs investigated, in recent history (immediately before the suicidal act), they were, in order of their declared frequency: anxiety (58 cases; 68.24%), sadness (57 cases; 67.06%), loss of interest in life (57 cases; 67.06%), insomnia (52 cases; 61.18%), tendency to isolation (47 cases; 55.29%), communication of suicidal ideation (37 cases; 43.53%). These warning signs are suggestive elements for the accentuation of depressive symptoms immediately before death.

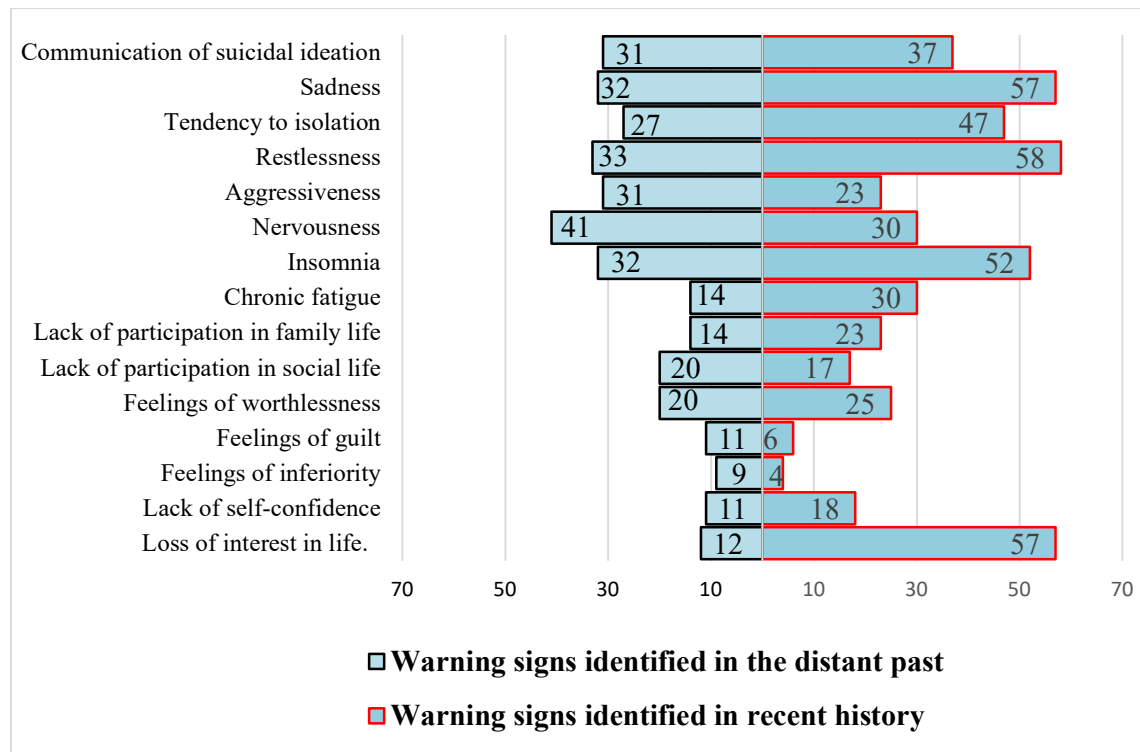
Regarding the analysis of warning signs from the past versus the recent history, relatives reported increasing frequency before death, especially the following signs: loss of interest in life - from 14.12% (12 cases) in the distant past to 67.06% (57 cases) in the recent history; sadness - from 37.64% (32 cases) in the distant past to 67.06% (57 cases) in the recent history; anxiety - from 38.82% (33 cases) in the distant past to 68.24% (58 cases) in the recent history; insomnia - from 37.64% (32 cases) in the distant past to 61.18% (52 cases) in the recent history; tendency to isolate - from 31.76% (27 cases) in the distant past to 55.29% (47 cases) in the recent history; chronic fatigue - from 16.47% (14 cases) in the distant past to 35.29% (30 cases) in the recent history.

With increasing frequency in recent history (compared to the distant past) the following signs have also been reported: communication of suicidal ideation - from 36.47% (31 cases) in the

distant past to 43.53% (37 cases) in recent history; lack of participation in family life - from 16.47% (14 cases) in distant past to 27.06% (23 cases) in recent history; feelings of worthlessness - from 23.53% (20 cases) in distant past to 29.41% (25 cases) in recent history.

On the other hand, the relatives described a decreasing frequency in the period immediately before the death, especially of nervousness (from 48.24%; 41 cases to 35.29%; 30 cases) and aggressiveness (from 36.47%; 31 cases to 27.06%; 23 cases); less decreased feelings of guilt (from 12.94%; 11 cases to 7.06%; 6 cases) and lack of participation in social life (from 23.53%; 20 cases to 20.00%; 17 cases) as shown in figure no. 7.

Figure no. 7 - Graphical representation of suicides according to their presence or absence of the 15 investigated signs, distant past as well as recent history; Sibiu County; 2020-2021



These findings are congruent with the fact that immediately before the suicidal act with lethal outcomes, the decision to proceed with the act is firm; depressive symptoms increase in intensity and the state of nervousness/aggressiveness decreases.(3)

- We also investigated the degree of kinship of the relatives of people who committed suicide, based on the fact that the literature considers them a key element(239) in the investigative approach to suicidal data. Similarly, the degree of closeness to the person who committed suicide is an indicator of the reliability of the data obtained. We found that for the 85 suicide cases from 2020-2021, in 78 cases (91.76%) respondents were from the deceased's family (husband/wife, son/daughter, father/mother), and in only 3 cases (3.53%) were neighbors/acquaintances; in 4 cases (4.71%) were other close persons.

It is believed that the psychological effects of the COVID-19 crisis will become progressively evident in the months and years to come, as consequences due to chronic anxiety, prolonged suffering, physical distance, loneliness, death of family members or friends, and job loss manifest themselves.(291) Therefore, as the literature argues,(330,331) there is a need for mental health programs designed to identify and treat the severe psychosocial consequences of the pandemic.

II.4.6. Conclusions

The third study of the present research focused on the investigation of persons who committed suicide during the COVID-19 pandemic (85 cases) in Sibiu County and the analysis of suicide risk factors, suicidal motivation and suicidal behavior, using a specially designed questionnaire (as an integral part of the psychological autopsy method).

By administering the questionnaire, we obtained data on suicide risk factors already analyzed in the two previous studies and were able to confirm the degree to which these factors affect suicidal determinism. We also verified the validity of the findings of the first two studies and even obtained additional elements; thus, proving once again the usefulness of this research tool.

Following the third study we confirmed the following suicide risk factors:

- Suicide risk was significantly higher in males.
- The age groups most affected during the COVID-19 pandemic in Sibiu County were 60-64 years and 45-49 years.
- We recorded 47 suicides in urban areas (55.30%) and 38 suicides in rural areas (44.70%). In the context of the high urbanity of Sibiu County, we can even speak of a vulnerability to suicide in rural areas.
- We found increased suicide risk in people with anomic marital status (single, divorced, widowed); this status was detected in almost two-thirds of the cases analyzed, with a high proportion of single people (about one-third).
- The majority of suicides from 2020-2021, as expected, were among Romanian nationals and of Orthodox religion.
- The most suicides were found among people who had a high school education, but also among those with 5 to 8 grades and those who completed a vocational school.
- The majority of cases were among pensioners (39 cases; 45.88%), with a significant proportion of those without an occupation.
- Between 2020-2021 there were 60 cases (70.59%) of suicides at home (possibly in the context of movement restrictions during the pandemic period); only 12 suicides (14.12%) occurred in public places. At the same time, we observed a relatively high number of suicides (13 cases; 15.29%) in hospitals (a possible contributory role of the measures imposing compulsory hospitalization, including asymptomatic cases).
- Analysis of the seasonality of these deaths revealed an increased number in summer, in July and in August.
- Most suicides occurred on Mondays, followed by Saturdays, then Fridays and Sundays.

- Hanging remained the suicide method of choice even during the COVID-19 pandemic; three-quarters of suicides were performed by this method. We also noted 8 cases of suicide by jumping from heights (9.42%) and 3 cases by self-inflicted burns (3.52%).

- Respondents reported the existence of psychiatric pathology in 39 cases (45.88%), without being able to specify the psychiatric diagnoses of the suicides. These data appear to be relatively accurate, despite their declarative nature, given that in the second survey, we documented an approximately equal number of cases with psychiatric illness (37 cases; 43.53%) to those declared by relatives. It can thus be stated that the hetero-anamnestic data obtained by applying the proposed questionnaire are close to reality.

- Organic pathology was reported in more than half of the cases analyzed (48 cases; 56.47%), mainly cardiac (29 cases; 10.59%) and urogenital (7 cases; 8.23%). COVID-19 disease was reported in 6 cases (7.06%).

In addition to confirming the risk factors listed above, the proposed research tool (the specially designed questionnaire) has also proved useful in specifying some recognized suicide risk factors that could not be quantified in previous studies of the PhD thesis.

- Investigating the number of children revealed that over a third of those who committed suicide between 2020-2021 were childless.

- Investigation of the profession of those who committed suicide revealed as risk categories those with no vocational training (almost a quarter) and unskilled workers (10.59%).

- Low income is also a suicide risk factor, especially if other risk factors are associated, a risk that can be increased due to conditions of the COVID-19 pandemic (through its socio-economic implications). In the cases analyzed, we found that in more than half of the cases (50.58%) the people who committed suicide in the 2020-2021 period had a personal monthly income below 1500 lei/month. Likewise, the analysis of family income/family members showed that in 39 cases (45.88%) it was less than 1500 lei/month.

- More than two-thirds of the people investigated consumed alcohol. The respondents' statements showed that more than a third consumed alcohol daily. More than a third consumed any kind of alcohol and 16.47% of them consumed spirits.

- In about a third of cases (28 cases; 32.94%) relatives reported the existence of suicide attempts in their personal history.

- Suicide attempts in the family of those who committed suicide were identified in 20 cases (23.53%). In 12 cases (14.12%) suicide was attempted by close relatives.

The applied questionnaire proved to be a particularly important tool for detecting suicidal motives (subject to their declarative character), but also in terms of the outlining of a true depressive syndrome (underdiagnosed/diagnosed clinically as depression), based on the presence of the 15 signs investigated.

- The most common reasons for suicide, perceived and reported as such by respondents, were: own illness or infirmity, family conflicts, death or illness of a loved one, and emotional problems. It should be noted that in 13 cases (15.29%) suicide was attributed to various consequences of the COVID-19 pandemic.

- Comparing the frequency with which these signs appeared in the distant past and recent history, we found a significant increase in the number and importance of the following 'warning signs': loss of interest in life; sadness; restlessness; insomnia; tendency to isolation; chronic fatigue.

With increasing frequency (to a lesser extent) in recent history (compared to the distant past) the following signs were also reported: communication of suicidal ideation; lack of participation in family life; feelings of worthlessness. In contrast, relatives described a decreasing frequency in the period immediately before death, especially of nervousness and aggression.

The presence or more frequent appearance of these signs in recent history can be considered real 'warning signs', suggestive of increased depressive symptoms and the possible emergence of a suicidal act with lethal outcomes. Based on the above, I believe that the increase in depressive symptoms, coupled with a decrease in nervousness and aggressiveness, may raise the question of a suicidal act with a lethal outcome.

Based on the data obtained by administering the questionnaire, we have outlined the 'profile' of the person at maximum risk of suicidal act in the 2020-2021 period - the period of the COVID-19 pandemic: male; age group: 60-64 years, 45-49 years; urban environment of origin, but bearing a high probability of originating from a rural environment; anomic marital status (especially unmarried, but also divorced or widowed); Romanian nationality; Orthodox religion; level of education: high school education, vocational school, education between 5 and 8 grades; no vocational training or unskilled worker; retired or without occupation; no children; personal monthly income less than 1500 lei; family/member income less than 1500 lei/month; suicidal act occurs at home; suicidal act occurs more frequently in summer (in July or August); suicidal act occurs more frequently on Mondays; suicidal method chosen is predominantly hanging; the second most frequent method is jumping from heights; daily consumption of alcohol (any kind of alcohol or spirits); with pre-existing psychiatric pathology (rarely specified as a diagnosis by respondents); with various organic pathologies (particularly cardiac and urogenital, but also infectious-contagious - infection with SARS-CoV-2); with suicide attempts in personal and family history; more frequent suicidal reasons: own illness or infirmity; family conflicts; death/illness of a close person; sentimental problems, legal problems, material problems, COVID-19 pandemic; presence of 15 signs outlining a depressive type symptomatology: both in the distant antecedents (more frequently nervousness, restlessness, sadness, insomnia, aggressiveness, communication of suicidal ideation, tendency to isolate, lack of participation in society, feelings of worthlessness) and in the recent antecedents - immediately prior to the suicidal act (mostly restlessness, sadness, loss of interest in life, insomnia, tendency to isolate, communication of suicidal ideation, decrease in aggressive behavior - decrease in nervousness and aggressiveness).

GENERAL CONCLUSIONS

The world was not prepared for the uncertainty of the greatest public health crisis since the advent of the COVID-19 pandemic, which dramatically changed the course and natural evolution of humankind, disrupted routine access to health services, including psychiatric services, and led to the emergence or aggravation of mental health problems in some vulnerable people.

The research carried out an X-ray of suicide victims in Sibiu County between 2018-2021, with a focus on the changes in the suicide pattern during the COVID-19 pandemic period, by comparing the pre-pandemic period (2018-2019) with the COVID-19 pandemic evolution period (2020-2021). Of the total 189 suicide cases realized, 85 occurred during the pandemic. Although the number of cases decreased during 2020-2021, the percentage of these deaths in violent deaths remained similar.

The first study of the doctoral research conducted a review of suicide risk factors for the entire 2018-2021 period, focusing on the evolving trends of suicide in a pandemic context. We were able to demonstrate that the recognized suicidal vulnerability of men, older people, and those with anomic marital status increased during the pandemic years. We noted an increase in the proportion of suicides in rural areas, although the differences between urban and rural areas were not significant. We documented the protective role of the family. Given the social restrictions imposed in the COVID-19 pandemic (including restriction of the right to movement, isolation at home/quarantine, hospitalization imposed even for asymptomatic cases, etc.), we naturally found a significant increase in suicides at home and even a slight increase in hospital suicides. Hanging was the suicide method of choice both in the pre-pandemic period and in the 2020-2021 period; we observed a slight increase in the proportion of suicides by jumping from heights, and the emergence of harsher and/or atypical suicide methods (self-inflicted burns, self-hitting against blunt objects, atypical mechanical asphyxiation, etc.) in the context of the pandemic.

Analysis of the presence of a mental illness as a recognized risk factor for the emergence of a suicidal act with a lethal outcome was the research object of the second study, in which we analyzed in detail the 78 cases of suicide from 2018-2021 in which we could document the psychiatric history. Comparative analysis of the COVID-19 pandemic period with the pre-pandemic period revealed an increasing percentage of mental illness in those who committed suicide during the pandemic period (43.53%), an increased vulnerability of male mental patients, an increased frequency of the age groups 45-49 years and 60-65 years, an increase in cases from rural areas, an increased vulnerability of those with atypical marital status (especially divorced and widowed), a slight increase in the proportion of suicide victims with higher education, while the proportion of those with a vocational school education decreased, an increase in the proportion of pensioners, a marked increase in deaths at home (hospital deaths remaining relatively constant). In terms of suicide methods, we noted an increase in the proportion of hanging, but also in the proportion of jumping from heights. Concerning patterns of acute alcohol consumption, we noted its presence in only a third of the cases in which alcohol

determination was possible, to a lesser extent than in the general group, which also included suicides without a psychiatric history.

In terms of the psychiatric pathology detected, we noted an increase in the number and proportion of cases of depression, as well as patients with schizophrenia; alcoholism remained as common as in the pre-pandemic period. In addition, during the COVID-19 pandemic, suicides with a single psychiatric diagnosis were on the increase. We also found an increase in those with fewer than 5 psychiatric admissions, with a statistically significant decrease only in women. Correlatively, we noted an increase in the proportion of suicides who had less than 20 days of psychiatric hospitalization. Finally, yet importantly, there was an increase in the number of those with a history of suicide attempts as compared to the pre-pandemic period.

The second study also looked at the investigation of records of reasons for suicide in general clinical observation sheets, the most common being: own illness or infirmity, family conflict, death or illness of a close person, and legal problems. For those who committed suicide during the COVID-19 pandemic, the following reasons for suicide increased compared to the pre-pandemic period: emotional problems, death or illness of a loved one, job loss, and legal problems.

Compared to the pre-pandemic period, for those who committed suicide during the pandemic, we found an increase in the frequency with which the following signs were recorded on first and last admission: communication of suicidal ideation, anxiety, loss of interest in life, lack of participation in family life and lack of participation in social life.

For the 85 cases of suicide during the pandemic period, in the third study, we conducted a prospective approach by applying a new research instrument - a specially designed questionnaire focused on investigating suicidal risk factors, suicidal motivation, and 15 characteristic signs of a depressive disorder. The data obtained by administering the questionnaire confirmed the risk factors identified in previous studies: male gender, age groups 60-65 and 45-49, abnormal marital status, retired or unemployed, increased number of suicides at home, hanging as the suicide method of choice, presence (in about half of the cases) of psychiatric and organic pathology.

The application of the questionnaire allowed the investigation of other suicide risk factors that could not be detected in the first two studies by simply searching medical and forensic documents. Thus, we were able to specify the following significant aspects: more than a third of the suicidal persons had no children, a quarter had no vocational training, and a large proportion had only vocational training as unskilled workers, personal and family income per family member was below 1500 lei per month in about half of the cases. In about a third of cases, respondents reported suicide attempts in their personal history, and in a quarter of cases suicide attempts were described in the family (in many cases in close relatives). Investigation of alcohol consumption showed that about two-thirds of the suicides consumed alcohol, and more than a third had daily alcohol consumption, with a preference for any kind of alcohol or spirits. These indicators of possible chronic alcoholism in conjunction with the data from the second study suggest an under-diagnosis of chronic alcoholism, which can be avoided by applying the questionnaire.

The particular value of this research tool was evident in investigating suicidal motivation. The most common reasons for suicide were: own illness or infirmity, family conflicts, death or illness of a close person, and sentimental problems; in 13 cases suicide was attributed to various consequences of the COVID-19 pandemic.

The application of the questionnaire also proved to be extremely useful in terms of identifying the presence of 15 signs that we considered depicting a depressive syndrome, frequently reported in the case of the suicides investigated (between a quarter and a half of cases). These signs were present with increased frequency (from half to two-thirds of cases) in recent history (immediately before the suicidal act). Significant increases in the importance of these signs in recent antecedents, compared to distant antecedents, were recognized in particular pertaining to loss of interest in life, sadness, restlessness, insomnia, the tendency to isolation, and chronic fatigue. On the other hand, in the period immediately before the death, nervousness, and aggressiveness decreased.

These findings led us to the conclusion that depressive signs increased in recent history, and can be real 'warning signs', suggestive of the imminence of a suicidal act with a lethal outcome, especially if they are correlated with decreased nervousness and aggressiveness.

ORIGINALITY AND INNOVATIVE RESEARCH CONTRIBUTIONS

Through the present research, we have carried out topical radiography of the situation of the phenomenon of suicide with lethal outcomes in Sibiu County, over the 2018-2021 period. The data obtained have increased reliability because all cases of this kind have been assessed, given the legally imposed obligation to forensically autopsy all cases of violent death, including suicides. Such an approach has not locally been done in previous years.

In addition, the research evaluated the evolving trends of suicide in the context of the COVID-19 pandemic, specifying locally the evolving trends of suicide and suicide risk factors, a topical approach that has been done to a very limited extent on a national level and to a limited extent at the international level.

In the second study, we also conducted an original approach to suicides within which we were able to document a psychiatric history - a useful approach in a context where the presence of a mental illness represents an important risk factor for suicide with a lethal outcome.

Finally, yet importantly, in the third study, we proposed an innovative research tool specifically designed for the in-depth investigation of completed suicide. This questionnaire made it possible not only to endorse the data obtained in the first two studies but also to investigate suicide risk factors not usually found in medical and forensic documents. In addition, this research tool better outlined suicidal motivation, and through the 15 signs present in the past and recent history, allowed me to demonstrate the presence of depressive-type symptoms even in cases that did not present an established diagnosis of depression.

RESEARCH LIMITATIONS

In the first study, it should be noted that the low number of cases during the COVID-19 pandemic period was limited by the actual duration of the COVID-19 pandemic (2020-2021).

The second study observed only suicides with a documented psychiatric history, thus an even more limited number of cases. In addition, for practical reasons, the research of psychiatric history, although thorough, only considered consultations and admissions at the 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital. Consequently, the research could not include any psychiatric examinations carried out in private outpatient clinics or any psychiatric admissions from other medical units in the country or abroad. However, the vast majority of psychiatric patients in Sibiu County go to the 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital for specialized treatment.

As for the third study, the data obtained, although extremely important from a research point of view, are declarative in nature, being a hetero-anamnesis (information about another). In this context, we cannot ignore the subjective nature of these statements.

PROPOSALS, CHALLENGES, AND FUTURE DIRECTIONS

I propose that the psychological autopsy method be applied also during the post-COVID-19 pandemic period, in order to outline the peculiarities of the suicidal phenomenon with lethal outcomes in Sibiu County, in order to detect the potential negative consequences in the longer timeframe. I propose that the research instrument (questionnaire) be applied nationally in forensic units.

As a follow-up to this research, it would be useful for future studies on suicide to focus not only on the suicidal person but also on some categories of vulnerable people, including 'suicide survivors'.

As we have shown, in a pandemic context, suicide risk factors may change from their usual pattern, leading to increased suicidal behaviors that may have both short-term and long-term consequences. The database obtained from the study will support suicide prevention and prevention programs in Sibiu County, by providing new details on the lethal suicide phenomenon during the COVID-19 pandemic, with the possibility of updating local suicide prevention programs.

ETHICAL CONSIDERATIONS

All data of individuals (including relatives of deceased persons) involved in the study were anonymized. Confidentiality of the data was ensured. In the questionnaire header, respondents were informed about the purpose for which the data were collected and their consent to the use of these data was obtained. Withdrawal of the deceased's data from the study by the next of kin

could be done at any time without any negative consequences. Moreover, no person expressed a verbal or written wish to be withdrawn from the study. The data obtained were used strictly for scientific research on lethal suicide in Sibiu County, within the present doctoral research. The scientific research did not involve any risk to the integrity of the relatives or family from whom the data were collected, as the data were anonymous. For this research the approval of the ethics board of 'Dr. Gh. Preda' Sibiu Psychiatric Clinical Hospital, with no. 11413/24.09.2021 has been obtained.

REFERENCES

1. World Health Organization. Suicide (Internet). Who.int. World Health Organization: WHO; 2021(cited 2022 Mar 12). Available from: <https://www.who.int/news-room/fact-sheets/detail/suicide>.
2. Stone DM, Crosby AE. Suicide Prevention. *American Journal of Lifestyle Medicine*. 2014 Oct 16;8(6):404–20.
3. Morar S. Studiul epidemiologic asupra deceselor prin suicid inregistrate între anii 1980-2002 în județul Sibiu(teză de doctorat). Târgu Mureș, România: UMF Târgu Mureș; 2003.
4. Rasul G, Nepal AK, Hussain A, Maharjan A, Joshi S, Lama A, et al. Socio-Economic Implications of COVID-19 Pandemic in South Asia: Emerging Risks and Growing Challenges. *Frontiers in Sociology*(Internet). 2021 Feb(cited 2022 Mar 13);6(629693). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8022444/>.
5. World Health Organization. Preventing suicide: A global imperative A global imperative(Internet). WHO Overview; 2014(cited 2022 Mar 12). Available from: https://apps.who.int/iris/bitstream/handle/10665/131056/9789241564779_eng.pdf?sequence=1.
6. Behera C, Gupta SK, Singh S, Balhara YPS. Trends in deaths attributable to suicide during COVID-19 pandemic and its association with alcohol use and mental disorders: Findings from autopsies conducted in two districts of India. *Asian Journal of Psychiatry*. 2021 Apr;58:102597.
7. De Berardis D, Martinotti G, Di Giannantonio M. Editorial: Understanding the Complex Phenomenon of Suicide: From Research to Clinical Practice. *Frontiers in Psychiatry*(Internet). 2018 March(cited 2020 Sept 10)1;9. Available from: <https://www.frontiersin.org/articles/10.3389/fpsy.2018.00061/full>.
8. Ajdacic-Gross V. Suizid – Generelle Aspekte, Epidemiologie, Risikofaktoren. *Therapeutische Umschau*. 2015 Oct;72(10):603–9.
9. Rasul G, Nepal AK, Hussain A, Maharjan A, Joshi S, Lama A, et al. Socio-Economic Implications of COVID-19 Pandemic in South Asia: Emerging Risks and Growing Challenges. *Frontiers in Sociology*(Internet). 2021 Feb(cited 2021 Dec 9);6(629693). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8022444/>.
10. Efstathiou V, Stefanou M-I, Siafakas N, Makris M, Tsivgoulis G, Zoumpourlis V, et al. Suicidality and COVID-19: Suicidal ideation, suicidal behaviors and completed suicides amidst the COVID-19 pandemic (Review). *Experimental and Therapeutic Medicine*. 2021 Dec 2;23(1).
11. Costea G, Belis V, Dermengiu S, Patru A, Popa M, Popa-Teodosie S. Studiu analitic al cauzelor de deces prin moarte autoprovocată, Rom. *J Leg Med*. 1997;5(4):375-383.

12. Barraclough B, Shepherd D. A necessary neologism: the origin and uses of suicide. *Suicide & Life-Threatening Behavior*(Internet). 1994(cited 2021 Jun 3);24(2):113–26. Available from: <https://pubmed.ncbi.nlm.nih.gov/8053006/>.
13. World Health Organization: WHO. Suicide(Internet). Who.int. World Health Organization: WHO; 2019.(cited 2021 Mar 10). Available from: https://www.who.int/health-topics/suicide#tab=tab_1.
14. Institutul de Medicină Legală Mina Minovici(Internet). inml-mm.ro.(cited 2022 Mar 13). Available from: <https://inml-mm.ro/?pg=pdf/dds2018>.
15. Institutul de Medicină Legală Mina Minovici(Internet). inml-mm.ro.(cited 2022 Mar 13). Available from: <https://inml-mm.ro/?pg=pdf/dds2019>.
16. Banerjee D, Kosagisharaf JR, Sathyanarayana Rao T. 'The Dual Pandemic' of Suicide and COVID-19: A Biopsychosocial Narrative of Risks and Prevention. *Psychiatry Research*. 2020 Nov;295:113577.
17. O'Connor RC, Sheehy NP, O'Connor DB. The classification of completed suicide into subtypes. *Journal of Mental Health*. 1999 Jan;8(6):629–37.
18. Pickering WSF, Walford G. *Durkheim's Suicide*. Routledge; 2002.
19. Joiner TE, Van Orden KA, Witte TK, Rudd MD. *The interpersonal theory of suicide: Guidance for working with suicidal clients*. Washington: American Psychological Association; 2009.
20. Rubinstein DH. A Stress-Diathesis Theory of Suicide. *Suicide and Life-Threatening Behavior*. 1986 Jun;16(2):182–97.
21. Klonsky ED, May AM. The Three-Step Theory (3ST): A New Theory of Suicide Rooted in the 'Ideation-to-Action' Framework. *International Journal of Cognitive Therapy*(Internet). 2015 Jun(cited 2021 Oct 2);8(2):114–29. Available from: <https://www2.psych.ubc.ca/~klonsky/publications/3ST.pdf>.
22. Goodfellow B, Kølves K, De Leo D. Contemporary Classifications of Suicidal Behaviors. *Crisis*. 2019 Sep 12;1–8.
23. Health and Community Care Risk and Protective Factors for Suicide and Suicidal Behaviour: A Literature Review(Internet). 2008(cited 2021 Aug 14) Available from la: <https://dspace.stir.ac.uk/bitstream/1893/2206/1/Suicide%20review1.pdf>.
24. Suicide Prevention Program(Internet). Western Michigan University. 2013(cited 2021 Mar 13). Available from: <https://wmich.edu/suicideprevention/about>.
25. Cerel J, Maple M, van de Venne J, Moore M, Flaherty C, Brown M. Exposure to Suicide in the Community: Prevalence and Correlates in One U.S. State. *Public Health Reports*. 2016 Jan;131(1):100–7.
26. Cerel J, McIntosh JL, Neimeyer RA, Maple M, Marshall D. The Continuum of 'Survivorship': Definitional Issues in the Aftermath of Suicide. *Suicide and Life-Threatening Behavior*. 2014 Apr 7;44(6):591–600.
27. Bhugra D, Ventriglio A, Watson C. Suicide among doctors: A narrative review. *Indian Journal of Psychiatry*. 2020;62(2):114.

28. World Health Organization. Preventing suicide: a community engagement toolkit(Internet). apps.who.int. World Health Organization; 2018(cited 2021 Oct 14). Available from: <https://apps.who.int/iris/handle/10665/272860>.
29. Clapperton A, Bugeja L, Newstead S, Pirkis J. Identifying Typologies of Persons Who Died by Suicide: Characterizing Suicide in Victoria, Australia. Archives of Suicide Research. 2018 Nov 17;1–16.
30. Kennard J. Understanding Suicide among Men(Internet). Verywell Mind. Verywellmind; 2003(cited 2022 Mar 18). Available from: <https://www.verywellmind.com/men-and-suicide-2328492>.
31. Suicide Risk Assessment Guide A Resource for Health Care Organizations(Internet).(cited 2022 Mar 21). Available from: <https://www.patientsafetyinstitute.ca/en/toolsResources/SuicideRisk/Documents/Suicide%20Risk%20Assessment%20Guide.pdf>.
32. Cibis A, Mergl R, Bramesfeld A, Althaus D, Niklewski G, Schmidtke A, et al. Preference of lethal methods is not the only cause for higher suicide rates in males. Journal of Affective Disorders(Internet). 2012 Jan(cited 2021 Dec 10);136(1-2):9–16. Available from <https://www.sciencedirect.com/science/article/pii/S0165032711005179>.
33. Kennard J. Understanding Suicide among Men(Internet). Verywell Mind. Verywellmind. 2003.(cited 2022 Mar 18). Available from: <https://www.verywellmind.com/men-and-suicide-2328492>.
34. World Population Review. Suicide Rate By Country 2020(Internet). worldpopulationreview.com. 2020.(cited 2022 Mar 23). Available from: <https://worldpopulationreview.com/country-rankings/suicide-rate-by-country>.
35. Conwell Y, Van Orden K, Caine ED. Suicide in Older Adults. Psychiatric Clinics of North America(Internet). 2011 Jun(cited 2021 Sept 6);34(2):451–68. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3107573/>.
36. American Foundation for Suicide Prevention. Suicide statistics(Internet). American Foundation for Suicide Prevention. 2022.(cited 2022 Mar 18). Available from: <https://afsp.org/suicide-statistics/>.
37. Suicide | Psychology Today(Internet). Psychology Today. 2016.(cited 2022 Mar 22). Available from: <https://www.psychologytoday.com/us/basics/suicide>.
38. Ministerul Sănătății. Institutul Național de Sănătate Publică. Centrul Național de Evaluarea și Promovarea Stării de Sănătate. Centrul Regional de Sănătate Publică Sibiu. Sănătate Mintală. Analiză de Situație.(Internet).(cited 2022 Mar 22). Available from: https://www.dsptimis.ro/promovare/sm_21_analiza.pdf.
39. Home(Internet). www.euro.who.int.(cited 2022 Mar 22). Available from: https://www.euro.who.int/__data/assets/pdf_file/0005/383891/adolescent-mh-fseng.pdf.
40. Grøholt B, Ekeberg Ø. Suicide in young people under 15 years: Problems of classification. Nordic Journal of Psychiatry. 2003 Oct;57(6):411–7.

41. Casant J, Helbich M. Inequalities of Suicide Mortality across Urban and Rural Areas: A Literature Review. *International Journal of Environmental Research and Public Health*. 2022 Feb 25;19(5):2669.
42. Fontanella CA, Hiance-Steelesmith DL, Phillips GS, Bridge JA, Lester N, Sweeney HA, et al. Widening Rural-Urban Disparities in Youth Suicides, United States, 1996-2010. *JAMA Pediatrics*(Internet). 2015 May(cited 2021 Oct 12);169(5):466. Available from: <https://jamanetwork.com/journals/jamapediatrics/fullarticle/2195006>.
43. Levin KA, Leyland AH. Urban/rural inequalities in suicide in Scotland, 1981–1999. *Social Science & Medicine*. 2005 Jun;60(12):2877–90.
44. Barry R, Rehm J, de Oliveira C, Gozdyra P, Kurdyak P. Rurality and Risk of Suicide Attempts and Death by Suicide among People Living in Four English-speaking High-income Countries: A Systematic Review and Meta-analysis. *The Canadian Journal of Psychiatry*. 2020 Jan 29;070674372090265.
45. Helbich M, Blüml V, de Jong T, Plener PL, Kwan M-P, Kapusta ND. Urban–rural inequalities in suicide mortality: a comparison of urbanicity indicators. *International Journal of Health Geographics*. 2017 Oct 30;16(1).
46. Qin P. Suicide risk in relation to level of urbanicity-a population-based linkage study. *International Journal of Epidemiology*. 2005 Apr 25;34(4):846–52.
47. Li M, Katikireddi SV. Urban-rural inequalities in suicide among elderly people in China: a systematic review and meta-analysis. *International Journal for Equity in Health*. 2019 Jan 3;18(1).
48. Trovato F. A Longitudinal Analysis of Divorce and Suicide in Canada. *Journal of Marriage and the Family*. 1987 Feb;49(1):193.
49. Lawrence RE, Oquendo MA, Stanley B. Religion and Suicide Risk: A Systematic Review. *Archives of Suicide Research*. 2015 Jul 20;20(1):1–21.
50. Torgler B, Schaltegger C. Suicide and Religion: New Evidence on the Differences Between Protestantism and Catholicism. *Journal for the Scientific Study of Religion*(Internet). 2014 Jun(cited 2022 Mar 22);53(2):316–40. Available from: <http://www.jstor.org/stable/24644267>.
51. Racial and Ethnic Disparities | Suicide Prevention Resource Center(Internet). www.sprc.org.(cited 2022 Mar 23). Available from: <https://www.sprc.org/scope/racial-ethnic-disparities>.
52. Suicide, Race, and Ethnicity | A Train Education(Internet). www.etrainceu.com.(cited 2022 Mar 22). Available from: <https://www.etrainceu.com/content/3-suicide-race-and-ethnicity-0>.
53. White Populations | Suicide Prevention Resource Center(Internet). www.sprc.org.(cited 2022 Mar 23). Available from: <https://www.sprc.org/scope/racial-ethnic-disparities/white>.
54. Black Populations | Suicide Prevention Resource Center(Internet). www.sprc.org.(cited 2022 Mar 24). Available from: <https://www.sprc.org/scope/racial-ethnic-disparities/black-populations>.

55. Rihmer Z, Gonda X, Kapitany B, Dome P. Suicide in Hungary-epidemiological and clinical perspectives. *Annals of General Psychiatry*. 2013;12(1):21.
56. Harmer B, Lee S, Duong TVH, Saadabadi A. Suicidal Ideation. 2021 Aug 6. In: *StatPearls*(Internet). Treasure Island (FL): StatPearls Publishing. 2022 Jan. PMID: 33351435.
57. Karasouli E, Latchford G, Owens D. The impact of chronic illness in suicidality: a qualitative exploration. *Health Psychology and Behavioral Medicine*. 2014 Jan;2(1):899–908.
58. Zaorsky NG, Zhang Y, Tuanquin L, Bluethmann SM, Park HS, Chinchilli VM. Suicide among cancer patients. *Nature Communications*. 2019 Jan 14;10(1).
59. Kumar V, Chaudhary N, Soni P, Jha P. Suicide Rates in Cancer Patients in the Current Era in United States. *American Journal of Psychiatry Residents' Journal*. 2017 Jan;12(1):11–4.
60. Misono S, Weiss NS, Fann JR, Redman M, Yueh B. Incidence of Suicide in Persons With Cancer. *Journal of Clinical Oncology*. 2008 Oct 10;26(29):4731–8.
61. Spicer RS, Miller TR. Suicide acts in 8 states: incidence and case fatality rates by demographics and method. *Am J Public Health*. 2000 Dec;90(12):1885-91.
62. Zaorsky NG, Churilla TM, Egleston BL, Fisher SG, Ridge JA, Horwitz EM, et al. Causes of death among cancer patients. *Annals of Oncology*(Internet). 2017 Feb(cited 2022 Mar 13);28(2):400–7. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5834100/>.
63. Andersen BL, DeRubeis RJ, Berman BS, Gruman J, Champion VL, Massie MJ, et al. Screening, Assessment, and Care of Anxiety and Depressive Symptoms in Adults with Cancer: An American Society of Clinical Oncology Guideline Adaptation. *Journal of Clinical Oncology*. 2014 May 20;32(15):1605–19.
64. Pringle B, Colpe LJ, Heinssen RK, Schoenbaum M, Sherrill JT, Claassen CA, et al. A Strategic Approach for Prioritizing Research and Action to Prevent Suicide. *Psychiatric Services*. 2013 Jan;64(1):71–5.
65. Zortea TC, Brenna CTA, Joyce M, McClelland H, Tippett M, Tran MM, et al. The Impact of Infectious Disease-Related Public Health Emergencies on Suicide, Suicidal Behavior, and Suicidal Thoughts. *Crisis*. 2020 Oct 16;1–14.
66. Ahmedani BK, Peterson EL, Hu Y, Rossom RC, Lynch F, Lu CY, et al. Major Physical Health Conditions and Risk of Suicide. *American Journal of Preventive Medicine*. 2017 Sep;53(3):308–15.
67. Gvion Y, Apter A. Suicide and Suicidal Behavior. *Public Health Reviews*. 2012 Dec;34(2).
68. Arsenault-Lapierre G, Kim C, Turecki G. Psychiatric diagnoses in 3275 suicides: a meta-analysis. *BMC Psychiatry*. 2004 Nov 4;4(1).
69. Cavanagh JT, Carson AJ, Sharpe M, Lawrie SM. Psychological autopsy studies of suicide: a systematic review. *Psychol Med*. 2003;33:395-40.

70. Bachmann S. Epidemiology of Suicide and the Psychiatric Perspective. *International Journal of Environmental Research and Public Health*(Internet). 2018 Jul(cited 2021 Aug 13);15(7):1425. Available from: <https://www.mdpi.com/1660-4601/15/7/1425>.
71. Brådvik L. Suicide Risk and Mental Disorders. *International Journal of Environmental Research and Public Health*(Internet). 2018 Sept(cited 2021 Dec 14);15(9):2028. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6165520/>.
72. Paris J. Suicidality in Borderline Personality Disorder. *Medicina*. 2019 May 28;55(6):223.
73. Crona L, Stenmarker M, Öjehagen A, Hallberg U, Brådvik L. Taking care of oneself by regaining control - a key to continue living four to five decades after a suicide attempt in severe depression. *BMC Psychiatry*. 2017 Feb 13;17(1).
74. Handley T, Rich J, Davies K, Lewin T, Kelly B. The Challenges of Predicting Suicidal Thoughts and Behaviours in a Sample of Rural Australians with Depression. *International Journal of Environmental Research and Public Health*(Internet). 2018 May(cited 2021 Aug 12);15(5):928. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5981967/>.
75. Rihmer Z. Suicide risk in mood disorders. *Current Opinion in Psychiatry*. 2007 Jan;20(1):17–22.
76. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, et al. The Epidemiology of Major Depressive Disorder. *JAMA*. 2003 Jun 18;289(23):3095.
77. Hettige NC, Bani-Fatemi A, Sakinofsky I, De Luca V. A biopsychosocial evaluation of the risk for suicide in schizophrenia. *CNS Spectrums*. 2017 May 24;23(4):253–63.
78. Kasckow J, Felmet K, Zisook S. Managing Suicide Risk in Patients with Schizophrenia. *CNS Drugs*(Internet). 2011 Feb(cited 2022 Feb 2);25(2):129–43. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3056073/>.
79. Tousignant M, Pouliot L, Routhier D, Vrakas G, McGirr A, Turecki G. Suicide, Schizophrenia, and Schizoid-Type Psychosis: Role of Life Events and Childhood Factors. *Suicide and Life-Threatening Behavior*. 2011 Jan 19;41(1):66–78.
80. Gómez-Durán EL, Martín-Eduardo C, Hurtado-Ruiz G. Clinical and epidemiological aspects of suicide in patients with schizophrenia. *Actas espanolas de psiquiatria*. 2012 40(6):333–345.
81. Togay B, Lippmann S. Suicide Prevention and Schizophrenia. *The Primary Care Companion for CNS Disorders*. 2019 Sep 26;21(5).
82. Pompili M, Amador XF, Girardi P, Harkavy-Friedman J, Harrow M, Kaplan K, et al. Suicide risk in schizophrenia: learning from the past to change the future. *Annals of General Psychiatry*(Internet). 2007 Mar(cited 2022 Jan 15)16;6(1). Available from: <https://annals-general-psychiatry.biomedcentral.com/articles/10.1186/1744-859X-6-10>.
83. Pompili M, Goracci A, Giordano G, Erbutto D, Girardi P, Klonsky ED, Baldessarini RJ. Relationship of non-suicidal self-injury and suicide attempt: a psychopathological perspective. *J Psychopathol*. 2015;21(4):348-353.

84. Sinclair JMA, Mullee MA, King EA, Baldwin DS. Suicide in Schizophrenia: A Retrospective Case-Control Study of 51 Suicides. *Schizophrenia Bulletin*. 2004 Jan 1;30(4):803–11.
85. Palmer BA, Pankratz VS, Bostwick JM. The Lifetime Risk of Suicide in Schizophrenia. *Archives of General Psychiatry*. 2005 Mar 1;62(3):247.
86. Tsuang MT. Excess Mortality in Schizophrenia and Affective Disorders. *Archives of General Psychiatry*. 1978 Oct 1;35(10):1181.
87. Pompili M, Serafini G, Innamorati M, Dominici G, Ferracuti S, Kotzalidis GD, et al. Suicidal Behavior and Alcohol Abuse. *International Journal of Environmental Research and Public Health*(Internet). 2010 Mar(cited 2021 Jun 9);7(4):1392–431. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2872355/>.
88. Qin P, Nordentoft M. Suicide Risk in Relation to Psychiatric Hospitalization. *Archives of General Psychiatry*. 2005 Apr 1;62(4):427.
89. Qin P, Agerbo E, Mortensen PB. Suicide risk in relation to family history of completed suicide and psychiatric disorders: a nested case-control study based on longitudinal registers. *The Lancet*. 2002 Oct;360(9340):1126–30.
90. Fu Q, Heath AC, Bucholz KK, Nelson EC, Glowinski AL, Goldberg J, et al. A twin study of genetic and environmental influences on suicidality in men. *Psychological Medicine*. 2002 Jan;32(1):11–24.
91. Tsuang MT Risk of suicide in the relatives of schizophrenics, manics, depressives, and controls. *The Journal of Clinical Psychiatry*. 1983;44(11):396–400.
92. Juel-Nielsen N, Videbech T. A twin study of suicide. *Acta Genet Med Gemellol*. 1970;19:307–310.
93. Roy A, Segal NL. Suicidal behavior in twins: a replication. *J Affect Disord*. 2001;66:71–74.
94. Runeson B, Åsberg M: Family history of suicide among suicide victims. *American Journal of Psychiatry*. 2003;160(8):1525-1526.
95. Pfeffer Cr, Normandin L, Kakuma T. Suicidal Children Grow Up: Suicidal Behavior and Psychiatric Disorders among Relatives. *Journal of the American Academy of Child & Adolescent Psychiatry*. 1994 Oct;33(8):1087–97.
96. Dwivedi Y. *The neurobiological basis of suicide*. Boca Raton, FL: Taylor & Francis/Crc Press; 2012.
97. Agerbo E. Familial, psychiatric, and socioeconomic risk factors for suicide in young people: nested case-control study. *BMJ*. 2002 Jul 13;325(7355):74–4.
98. Young IT, Iglewicz A, Glorioso D, Lanouette N, Seay K, Ilapakurti M, et al. Suicide bereavement and complicated grief. *Bereavement and Complicated Grief*. 2012 Jun;14(2):177–86.
99. Lawrence RE, Brent D, Mann JJ, Burke AK, Grunebaum MF, Galfalvy HC, et al. Religion as a Risk Factor for Suicide Attempt and Suicide Ideation Among Depressed Patients. *The Journal of Nervous and Mental Disease*. 2016 Nov;204(11):845–50.

100. Haas AP, Eliason M, Mays VM, Mathy RM, Cochran SD, D'Augelli AR, et al. Suicide and Suicide Risk in Lesbian, Gay, Bisexual, and Transgender Populations: Review and Recommendations. *Journal of Homosexuality*. 2010 Dec 30;58(1):10–51.
101. Lyons BH, Walters ML, Jack SPD, Petrosky E, Blair JM, Ivey-Stephenson AZ. Suicides Among Lesbian and Gay Male Individuals: Findings From the National Violent Death Reporting System. *American Journal of Preventive Medicine*. 2019 Apr;56(4):512–21.
102. Virupaksha H, Muralidhar D, Ramakrishna J. Suicide and suicidal behavior among transgender persons. *Indian Journal of Psychological Medicine(Internet)*. 2016 Nov-Dec(cited 2021 Sept 5);38(6):505-509. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5178031/>.
103. Ploderl M. Suicide Risk over the Course of the Day, Week and Life. *Psychiatria Danubina*. 2021 Nov 17;33(3):438–45.
104. Johnson BA, Brent DA, Bridge J, Connolly J. The familial aggregation of adolescent suicide attempts. *Acta Psychiatrica Scandinavica*. 1998 Jan;97(1):18–24.
105. Wu Y, Dang M, Li H, Jin X, Yang W. Identification of genes related to mental disorders by text mining. *Medicine*. 2019 Oct;98(42):e17504.
106. Brent DA, Melhem N. Familial Transmission of Suicidal Behavior. *Psychiatric Clinics of North America*. 2008 Jun;31(2):157–77.
107. McGirr A. Dysregulation of the sympathetic nervous system, hypothalamic–pituitary–adrenal axis and executive function in individuals at risk for suicide. *Journal of Psychiatry & Neuroscience*. 2010 Nov 1;35(6):399–408.
108. Pompili M, Serafini G, Innamorati M, Möller-Leimkühler AM, Giupponi G, Girardi P, et al. The hypothalamic-pituitary-adrenal axis and serotonin abnormalities: a selective overview for the implications of suicide prevention. *European Archives of Psychiatry and Clinical Neuroscience*. 2010 Feb 20;260(8):583–600.
109. Dwivedi Y. Brain-derived neurotrophic factor and suicide pathogenesis. *Annals of Medicine(Internet)*. 2010 Jan(cited 2022 Feb 12);42(2):87–96. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3708652/>.
110. Kim YK, Lee HP, Won SD, Park EY, Lee HY, Lee BH, et al. Low plasma BDNF is associated with suicidal behavior in major depression. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2007 Jan;31(1):78–85.
111. De Paermentier F, Mauger JM, Lowther S, Crompton MRufus, Katona CLE, Horton RW. Brain α -adrenoceptors in depressed suicides. *Brain Research*. 1997 May;757(1):60–8.
112. Bondy B, Buettner A, Zill P. Genetics of suicide. *Molecular Psychiatry*. 2006 Feb 7;11(4):336–51.
113. Poulter MO, Du L, Weaver ICG, Palkovits M, Faludi G, Merali Z, et al. GABAA Receptor Promoter Hypermethylation in Suicide Brain: Implications for the Involvement of Epigenetic Processes. *Biological Psychiatry*. 2008 Oct;64(8):645–52.

114. Merali Z. Dysregulation in the Suicide Brain: mRNA Expression of Corticotropin-Releasing Hormone Receptors and GABAA Receptor Subunits in Frontal Cortical Brain Region. *Journal of Neuroscience*. 2004 Feb 11;24(6):1478–85.
115. Poulter MO. Altered organization of GABAA receptor mRNA expression in the depressed suicide brain. *Frontiers in Molecular Neuroscience*. 2010;3.
116. Lee BH, Kim YK. Reduced platelet BDNF level in patients with major depression. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*. 2009 Aug;33(5):849–53.
117. Fudalej S, Fudalej M, Kostrzewa G, Kuźniar P, Franaszczyk M, Wojnar M, et al. Angiotensin-Converting Enzyme Polymorphism and Completed Suicide: An Association in Caucasians and Evidence for a Link with a Method of Self-Injury. *Neuropsychobiology*. 2009;59(3):151–8.
118. Sparks DL, Hunsaker JC, Amouyel P, Malafosse A, Bellivier F, Leboyer M, et al. Angiotensin I-converting enzyme I/D polymorphism and suicidal behaviors. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*. 2009 Mar 5;150B(2):290–4.
119. Willour VL, Seifuddin F, Mahon PB, Jancic D, Pirooznia M, Steele J, et al. A genome-wide association study of attempted suicide. *Molecular Psychiatry*. 2011 Mar 22;17(4):433–44.
120. Yehuda R, Southwick SM, Ostroff RB, Mason JW, Giller E Jr. Neuroendocrine aspects of suicidal behavior. *Endocrinol Metab Clin North Am*. 1988 Mar;17(1):83-102.
121. Sein Anand J, Chodorowski Z, Ciechanowicz R, Wiśniewski M, Pankiewicz P. The relationship between suicidal attempts and menstrual cycle in women. *Przegl Lek*. 2005;62(6):431-3.
122. Zhou Y, Ren W, Sun Q, Yu KM, Lang X, Li Z, et al. The association of clinical correlates, metabolic parameters, and thyroid hormones with suicide attempts in first-episode and drug-naïve patients with major depressive disorder comorbid with anxiety: a large-scale cross-sectional study. *Translational Psychiatry*. 2021 Feb 4;11(1).
123. Furgal-Borzych A, Lis GJ, Litwin JA, Rzepecka-Wozniak E, Trela F, Cichocki T. Increased incidence of pituitary microadenomas in suicide victims. *Neuropsychobiology*. 2007;55(3-4):163-6.
124. Surkan PJ, Strobino DM, Mehra S, Shamim AA, Rashid M, Wu LS-F, et al. Unintended pregnancy is a risk factor for depressive symptoms among socio-economically disadvantaged women in rural Bangladesh. *BMC Pregnancy and Childbirth*. 2018 Dec;18(1).
125. Dutheil F, Aubert C, Pereira B, Dambrun M, Moustafa F, Mermillod M, et al. Suicide among physicians and health-care workers: A systematic review and meta-analysis. Abe T, editor. *PLOS ONE*(Internet). 2019 Dec(cited 2022 Feb 12);14(12):e0226361. Available from: <https://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0226361>.

126. Booth N. Suicide in the farming community: methods used and contact with health services. *Occupational and Environmental Medicine*(Internet). 2000 Sep(cited Mar 17);57(9):642–4. Available from: <https://oem.bmj.com/content/57/9/642>.
127. Bryan CJ, Rozek DC. Suicide prevention in the military: a mechanistic perspective. *Current Opinion in Psychology*. 2018 Aug; 22:27–32.
128. Lin GM, Nagamine M, Yang SN, Tai YM, Lin C, Sato H. Machine Learning Based Suicide Ideation Prediction for Military Personnel. *IEEE Journal of Biomedical and Health Informatics*. 2020 Jul;24(7):1907–16.
129. Levine J, Sher L. Interdisciplinary Approach and Suicide Prevention Amongst U.S. Military Veterans. *Psychiatr Danub*. 2021;33(2):200.
130. Haas AP, Hendin H, Mann JJ. Suicide in College Students. *American Behavioral Scientist*. 2003 May;46(9):1224–40.
131. Lew B, Osman A, Huen JMY, Siau CS, Talib MA, Cunxian J, et al. A comparison between American and Chinese college students on suicide-related behavior parameters. *International Journal of Clinical and Health Psychology: IJCHP*(Internet). 2020(cited 2022 Feb 14);20(2):108–17. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7296251/>.
132. Blakely TA. Unemployment and suicide. Evidence for a causal association? *Journal of Epidemiology & Community Health*(Internet). 2003 Aug(cited Mar 12);57(8):594–600. Available from: <https://jech.bmj.com/content/57/8/594>.
133. Kaplan KJ, Harrow M. Social Status and Suicidal Activity Among Psychiatric Patients: Moderating Effects of Gender, Race and Psychiatric Diagnosis. *Archives of Suicide Research*. 2018 Dec 20;23(4):662–77.
134. Trout DL. The Role of Social Isolation in Suicide. *Suicide and Life-Threatening Behavior*. 1980 Mar;10(1):10–23.
135. Niu L, Jia C, Ma Z, Wang G, Sun B, Zhang D, et al. Loneliness, hopelessness and suicide in later life: a case–control psychological autopsy study in rural China. *Epidemiology and Psychiatric Sciences*. 2020;29.
136. Kockott G. Der Selbstmord-Versuch im Alter. *Fortschr Med*. 1981 Jul 9;99(26):1049–56.
137. Puzo Q, Mehlum L, Qin P. Rates and characteristics of suicide by immigration background in Norway. Mittendorfer-Rutz E, editor. *PLoS ONE*. 2018 Sep 28;13(9):e0205035.
138. Abebe DS, Lien L, Hjelde KH. What We Know and Don't Know About Mental Health Problems Among Immigrants in Norway. *Journal of Immigrant and Minority Health*(Internet). 2014 Feb(cited 2021 Oct 18);16(1):60–7. Available from: <https://link.springer.com/article/10.1007%2Fs10903-012-9745-9>.
139. Dalgard OS, Thapa SB, Hauff E, Mccubbin M, Syed HR. Immigration, lack of control and psychological distress: Findings from the Oslo Health Study. *Scandinavian Journal of Psychology*. 2006 Dec;47(6):551–8.

140. Syed HR, Dalgard OS, Dalen I, Claussen B, Hussain A, Selmer R, et al. Psychosocial factors and distress: a comparison between ethnic Norwegians and ethnic Pakistanis in Oslo, Norway. *BMC Public Health*. 2006 Jul 10;6(1).
141. Thapa SB, Hauff E. Gender differences in factors associated with psychological distress among immigrants from low- and middle-income countries. *Social Psychiatry and Psychiatric Epidemiology*. 2005 Jan;40(1):78–84.
142. Thapa SB, Dalgard OS, Claussen B, Sandvik L, Hauff E. Psychological distress among immigrants from high- and low-income countries: Findings from the Oslo Health Study. *Nordic Journal of Psychiatry*. 2007 Jan;61(6):459–65.
143. Amiri S. Prevalence of Suicide in Immigrants/Refugees: A Systematic Review and Meta-Analysis. *Archives of Suicide Research*. 2020 Aug 11;1–36.
144. Awaad R, Dailami M, Noureddine N. US policy of public charge inadmissibility and refugee suicides. *The Lancet Psychiatry*. 2020 Mar;7(3):e12.
145. Hollander A-C, Pitman A, Sjöqvist H, Lewis G, Magnusson C, Kirkbride JB, et al. Suicide risk among refugees compared with non-refugee migrants and the Swedish-born majority population. *The British Journal of Psychiatry*. 2019 Oct 14;217(6):686–92.
146. Hawton K. Influences of the media on suicide. *BMJ(Internet)*. 2002 Dec(cited 2021 Jun 13);325(7377):1374–5. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1124845/>.
147. Phillips DP. The influence of suggestion on suicide: substantive and theoretical implications of the Werther effect. *Am Sociol Rev*. 1974;39(3):340-54.
148. Hawton K, Simkin S, Deeks JJ, O'Connor S, Keen A, Altman DG, et al. Effects of a drug overdose in a television drama on presentations to hospital for self-poisoning: time series and survey study. *BMJ*. 1999 Apr 10;318(7189):972–7.
149. Stack S. Celebrities and suicide: a taxonomy and analysis, 1948-1983. *Am Sociol Rev*. 1987;52(3):401-12.
150. Cosman D, Cosman H. *Melancholia. De la tristețe la sinucidere*. Editura Risoprint, Cluj-Napoca; 2018.
151. Wiesner G. Suizidmethoden? ein Vergleich zwischen Ost- und Westdeutschland. *Bundesgesundheitsblatt - Gesundheitsforschung - Gesundheitsschutz*. 2004 Nov;47(11):1095–106.
152. Barber CW, Miller MJ. Reducing a Suicidal Person's Access to Lethal Means of Suicide. *American Journal of Preventive Medicine*. 2014 Sep;47(3):S264–72.
153. Corcoran P, Reulbach U, Perry IJ, Arensman E. Suicide and deliberate self-harm in older Irish adults. *International Psychogeriatrics*. 2010 Aug 18;22(8):1327–36.
154. Large MM, Nielssen OB. Suicide in Australia: meta-analysis of rates and methods of suicide between 1988 and 2007. *Medical Journal of Australia*. 2010 Apr;192(8):432–7.
155. Rodríguez Andrés A, Hempstead K. Gun control and suicide: The impact of state firearm regulations in the United States, 1995–2004. *Health Policy*. 2011 Jun;101(1):95–103.
156. Johnson RM, Coyne-Beasley T. Lethal means reduction: what have we learned? *Current Opinion in Pediatrics(Internet)*. 2009 Oct(cited 2022 Jul 8);21(5):635–40.

- Available from: <https://jhu.pure.elsevier.com/en/publications/lethal-means-reduction-what-have-we-learned-3>.
157. Dempsey CL, Benedek DM, Zuromski KL, Riggs-Donovan C, Ng THH, Nock MK, et al. Association of Firearm Ownership, Use, Accessibility, and Storage Practices With Suicide Risk Among US Army Soldiers. *JAMA Network Open*(Internet). 2019 Jun(cited 2022 Feb 14);2(6):e195383. Available from: <https://jamanetwork.com/journals/jamanetworkopen/article-abstract/2735465>.
 158. Skegg K, Firth H, Gray A, Cox B. Suicide by Occupation: Does Access to Means Increase the Risk? *Australian & New Zealand Journal of Psychiatry*. 2010 May;44(5):429–34.
 159. Elnour AA, Harrison J. Lethality of suicide methods. *Injury Prevention*. 2008 Feb 1;14(1):39–45.
 160. Beautrais A. Suicide by Jumping. *Crisis*. 2007 Jan;28(S1):58–63.
 161. Pirkis J, Too LS, Spittal MJ, Krysinaka K, Robinson J, Cheung YTD. Interventions to reduce suicides at suicide hotspots: a systematic review and meta-analysis. *The Lancet Psychiatry*. 2015 Nov;2(11):994–1001.
 162. Niederkrotenthaler T, Sonneck G, Dervic K, Nader IW, Voracek M, Kapusta ND, et al. Predictors of Suicide and Suicide Attempt in Subway Stations: A Population-based Ecological Study. *Journal of Urban Health*. 2012 Feb 9;89(2):339–53.
 163. John A, Hawton K, Gunnell D, Lloyd K, Scourfield J, Jones PA, et al. Newspaper Reporting on a Cluster of Suicides in the UK. *Crisis*. 2017 Jan;38(1):17–25.
 164. Isometsä E, Henriksson M, Heikkinen M, Lönnqvist J. Suicide after discharge from psychiatric inpatient care. *The Lancet*. 1993 Oct;342(8878):1055–6.
 165. O’Connell PH, Durns T, Kious BM. Risk of suicide after discharge from inpatient psychiatric care: a systematic review. *International Journal of Psychiatry in Clinical Practice*. 2020 Aug 4;1–11.
 166. Geddes JR, Juszczak E. Period trends in rate of suicide in first 28 days after discharge from psychiatric hospital in Scotland, 1968-92. *BMJ*. 1995 Aug 5;311(7001):357–60.
 167. Morthorst BR, Mehlum L, Pålsson SP, Mühlmann C, Hammerlin Y, Madsen T, et al. Suicide Rates in Nordic Prisons 2000–2016. *Archives of Suicide Research*. 2020 Apr 6;1–11.
 168. Wortzel HS, Binswanger IA, Anderson CA, Adler LE. Suicide among incarcerated veterans. *J Am Acad Psychiatry Law*. 2009;37(1):82-91
 169. Caravaca Sánchez F, Aizpurua E, Ricarte JJ, Barry TJ. Personal, Criminal and Social Predictors of Suicide Attempts in Prison. *Archives of Suicide Research*. 2020 Mar 13;1–14.
 170. The Lancet. Suicide in prisons: NICE fights fires. *The Lancet*. 2018 Mar;391(10124):912.
 171. Ajdacic-Gross V, Bopp M, Ring M, Gutzwiller F, Rossler W. Seasonality in suicide – A review and search of new concepts for explaining the heterogeneous phenomena. *Social Science & Medicine*. 2010 Aug;71(4):657–66.

172. Kalediene R, Starkuviene S, Petrauskiene J. Seasonal patterns of suicides over the period of socio-economic transition in Lithuania. *BMC Public Health*. 2006 Feb 22;6(1).
173. Kalediene R, Petrauskiene J. Inequalities in Daily Variations of Deaths from Suicide in Lithuania: Identification of Possible Risk Factors. *Suicide and Life-Threatening Behavior*. 2004 Jun;34(2):138–45.
174. Perlis ML, Grandner MA, Chakravorty S, Bernert RA, Brown GK, Thase ME. Suicide and sleep: Is it a bad thing to be awake when reason sleeps? *Sleep Medicine Reviews*. 2016 Oct;29:101–7.
175. Salib E, Gray N. Weather conditions and fatal self-harm in North Cheshire 1989–1993. *British Journal of Psychiatry*. 1997 Nov;171(5):473–7.
176. Salib E. Elderly suicide and weather conditions: is there a link? *Int J Geriatr Psychiatry*. 1997;12(9):937-941.
177. Nordin C, Swedin A, Zachau A. CSF 5-HIAA and atmospheric pressure. *Biological Psychiatry*. 1992 Mar;31(6):644–5.
178. Nordin C, Lindström L, Wieselgren I-M. Acid monoamine metabolites in the CSF of healthy controls punctured without preceding strict bedrest: A retrospective study. *Journal of Psychiatric Research*. 1996 Mar;30(2):127–33.
179. Eklundh T, Fernström V, Nordin C. Influence of tapping-time and atmospheric pressure on concentrations of monoamine metabolites in the cerebrospinal fluid: A prospective study in female volunteers. *Journal of Psychiatric Research*. 1994 Nov;28(6):511–7.
180. Gunnarsson T, Eklundh T, Eriksson M, Ali Qureshi G, Sjöberg S, Nordin C. Cholecystokinin peptides in cerebrospinal fluid: a study in healthy male subjects. *Regulatory Peptides*. 1997 Jan;68(1):57–61.
181. Conner KR, Duberstein PR, Conwell Y, Seidlitz L, Caine ED. Psychological Vulnerability to Completed Suicide: A Review of Empirical Studies. *Suicide and Life-Threatening Behavior*. 2001 Dec;31(4):367–85.
182. Duberstein PR. Are Closed-Minded People More Open to the Idea of Killing Themselves? *Suicide and Life-Threatening Behavior*. 2001 Mar;31(1):9–14.
183. King DA, Conwell Y, Cox C, Henderson RE, Denning DG, Caine ED. A Neuropsychological Comparison of Depressed Suicide Attempters and Nonattempters. *The Journal of Neuropsychiatry and Clinical Neurosciences*. 2000 Feb;12(1):64–70.
184. Joe S, Romer D, Jamieson PE. Suicide Acceptability is Related to Suicide Planning in U.S. Adolescents and Young Adults. *Suicide and Life-Threatening Behavior*. 2007 Apr;37(2):165–78.
185. Rajalin M, Hirvikoski T, Jokinen J. Family history of suicide and exposure to interpersonal violence in childhood predict suicide in male suicide attempters. *Journal of Affective Disorders*. 2013 May;148(1):92–7.
186. Hawton K, van Heeringen K. Suicide. *The Lancet*. 2009 Apr;373(9672):1372–81.
187. Gadsden VL, Ford MA, Breiner H. Parenting matters: supporting parents of children ages 0-8. Washington, Dc: The National Academies Press; 2016.

188. Tasmim S, Dada O, Wang KZ, Bani-Fatemi A, Strauss J, Adanty C, et al. Early-life stressful events and suicide attempt in schizophrenia: Machine learning models. *Schizophrenia Research*. 2020 Apr; 218:329–31.
189. Brent DA, Perper JA, Moritz G, Baugher M, Roth C, Balach L, Schweers J. Stressful life events, psychopathology, and adolescent suicide: a case control study. *Suicide Life Threat Behav*. 1993;23(3):179-87.
190. Weyrauch KF, Roy-Byrne P, Katon W, Wilson L. Stressful life events and impulsiveness in failed suicide. *Suicide Life Threat Behav*. 2001;31(3):311-9.
191. Bazrafshan M-R, Jahangir F, Mansouri A, Kashfi SH. Coping Strategies in People Attempting Suicide. *International Journal of High Risk Behaviors and Addiction*. 2014 Mar 9;3(1).
192. Heikkinen M, Aro H, Lönnqvist J. Life events and social support in suicide. *Suicide Life Threat Behav*. 1993;23(4):343-58.
193. Pigeon WR, Pinquart M, Conner K. Meta-analysis of sleep disturbance and suicidal thoughts and behaviors. *J Clin Psychiatry*. 2012;73(9):e1160-7.
194. Franklin JC, Ribeiro JD, Fox KR, Bentley KH, Kleiman EM, Huang X, et al. Risk factors for suicidal thoughts and behaviors: A meta-analysis of 50 years of research. *Psychological Bulletin*(Internet). 2017(cited 2022 Jun 18);143(2):187–232. Available from: <https://www.apa.org/pubs/journals/releases/bul-bul0000084.pdf>.
195. Fässberg MM, Cheung G, Canetto SS, Erlangsen A, Lapierre S, Lindner R, et al. A systematic review of physical illness, functional disability, and suicidal behaviour among older adults. *Aging & Mental Health*(Internet). 2016 Feb(cited 2022 Jun 14);20(2):166–94. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4720055/>.
196. Owen G, Belam J, Lambert H, Donovan J, Rapport F, Owens C. Suicide communication events: Lay interpretation of the communication of suicidal ideation and intent. *Social Science & Medicine*. 2012 Jul;75(2):419–28.
197. Wasserman D, Thanth TTH, Minh PTD, Goldstein M, Nordenskiöld A, Wasserman C. Suicidal process, suicidal communication and psychosocial situation of young suicide attempters in a rural Vietnamese community. *World Psychiatry*. 2008 Feb;7(1):47–53.
198. Mork E, Mehlum L, Barrett EA, Agartz I, Harkavy-Friedman JM, Lorentzen S, et al. Self-Harm in Patients with Schizophrenia Spectrum Disorders. *Archives of Suicide Research*. 2012 Apr;16(2):111–23.
199. Chan MKY, Bhatti H, Meader N, Stockton S, Evans J, O'Connor RC, et al. Predicting suicide following self-harm: systematic review of risk factors and risk scales. *British Journal of Psychiatry*(Internet). 2016 Oct(cited 2021 Mar 14);209(4):277–83. Available from: <https://www.cambridge.org/core/journals/the-british-journal-of-psychiatry/article/predicting-suicide-following-selfharm-systematic-review-of-risk-factors-and-risk-scales/C9D595168EDF06401A823E2E968915E1>.
200. Sher L. Alcohol consumption and suicide. *QJM: An International Journal of Medicine*. 2005 Nov 15;99(1):57–61.
201. Kendall RE. Alcohol and suicide. *Subst Alcohol Actions Misuse*. 1983;4(2-3):121-7.

202. Perez J, Beale E, Overholser J, Athey A, Stockmeier C. Depression and alcohol use disorders as precursors to death by suicide. *Death Studies*. 2020 Apr 2;1–9.
203. Bilban M, Škibin L. Presence of alcohol in suicide victims. *Forensic Science International*. 2005 Jan;147:S9–12.
204. Lasota D, Al-Wathinani A, Krajewski P, Mirowska-Guzel D, Goniewicz K, Hertelendy AJ, et al. Alcohol and the Risk of Railway Suicide. *International Journal of Environmental Research and Public Health*. 2020 Sep 24;17(19):7003.
205. Mann JJ. A Current Perspective of Suicide and Attempted Suicide. *Annals of Internal Medicine*. 2002 Feb 19;136(4):302.
206. Substance Abuse and Self-Harm | Design for Recovery - Sober Living Los Angeles, CA(Internet). designforrecovery.com.(cited 2022 Jan 11). Available from: https://designforrecovery.com/substance-abuse-and-self-harm/#_ftn3.
207. Yi H, Hwang J, Bae H-J, Kim N. Age and sex subgroups vulnerable to copycat suicide: evaluation of nationwide data in South Korea. *Scientific Reports*(Internet). 2019 Nov(cited 2022 Feb 15);9(1):1–9. Available from: <https://www.nature.com/articles/s41598-019-53833-8#Tab2>.
208. Deepali Patel, Simon MA, Taylor RM, Institute Of Medicine (U.S.). Forum on Global Violence Prevention. Contagion of violence: workshop summary. Washington D.C.: National Academies Press; 2013.
209. Ueda M, Mori K, Matsubayashi T, Sawada Y. Tweeting celebrity suicides: Users' reaction to prominent suicide deaths on Twitter and subsequent increases in actual suicides. *Social Science & Medicine*. 2017 Sep;189:158–66.
210. Hagihara A, Tarumi K, Abe T. Media suicide-reports, Internet use and the occurrence of suicides between 1987 and 2005 in Japan. *BMC Public Health*. 2007 Nov 11;7(1).
211. Motto JA. Newspaper Influence on Suicide. *Archives of General Psychiatry*. 1970 Aug 1;23(2):143.
212. Gratteri S, Ricci P, Tarzia P, Fineschi V, Sacco MA, Aquila I. When a suicide becomes a forensic enigma: The role of hanging marks and tools of suspension. *Medico-Legal Journal*. 2017 Mar 10;85(3):141–4.
213. Cusack D, Ferrara SD, Keller E, Ludes B, Mangin P, Väli M, et al. European Council of Legal Medicine (ECLM) principles for on-site forensic and medico-legal scene and corpse investigation. *International Journal of Legal Medicine*. 2016 Oct 28;131(4):1119–22.
214. Patil SS, Deokar RB, Vidhate SG, Tyagi S. An atypical case of suicidal cut throat injury. *Egyptian Journal of Forensic Sciences*. 2016 Dec;6(4):492–5.
215. Kumar S A, Kumar MS V, Babu YR, Prasad M. A case of 'atypical homicidal' cut-throat injury. *Medico-Legal Journal*. 2016 Jul 10;84(3):156–8.
216. Suicide of a patient with schizophrenia: a case report(Internet). *Alpha Psychiatry* 2007;8:74-78. Available from: <https://alpha-psychiatry.com/en/suicide-of-a-patient-with-schizophrenia-a-case-report-132195>.

217. Hassamal S, Keyser-Marcus L, Crouse Breden E, Hobron K, Bhattachan A, Pandurangi A. A Brief Analysis of Suicide Methods and Trends in Virginia from 2003 to 2012. *BioMed Research International*. 2015;2015:1–11.
218. Ahmad M, Hossain M. Hanging as a Method of Suicide: Retrospective Analysis of Postmortem Cases. *Journal of Armed Forces Medical College, Bangladesh*. 1970 Jan 1;6(2):37–9.
219. Pelletti G, Visentin S, Rago C, Cecchetto G, Montisci M. Alteration of the Death Scene After Self-stabbing: A Case of Sharp Force Suicide Disguised by the Victim as a Homicide? *Journal of Forensic Sciences*. 2017 Feb 7;62(5):1395–8.
220. Bohnert M, Faller-Marquardt M, Lutz S, Amberg R, Weisser H-J, Pollak S. Transfer of biological traces in cases of hanging and ligature strangulation. *Forensic Science International*. 2001 Feb;116(2-3):107–15.
221. Peschel O, Kunz SN, Rothschild MA, Mützel E. Blood stain pattern analysis. *Forensic Science, Medicine and Pathology*(Internet). 2010 Nov(cited 2022 Mar 12);7(3):257–70. Available from: <https://link.springer.com/article/10.1007/s12024-010-9198-1>.
222. Home PH, Norman DG, Williams MA. Software for the trajectory analysis of blood-drops: A systematic review. *Forensic Science International*. 2021 Nov;328:110992.
223. Lee S-Y, Seo Y-I, Moon B-S, Kim J-P, Goh J-M, Park N-K, et al. Study on development of forensic blood substitute: Focusing on bloodstain pattern analysis. *Forensic Science International*. 2020 Nov;316:110461.
224. Barroso M, Gallardo E. Hair analysis for forensic applications: is the future bright? *Bioanalysis*. 2014 Jan;6(1):1–3.
225. Yan H, Xiang P, Shen M. Current status of hair analysis in forensic toxicology in China. *Forensic Sciences Research*. 2021 Jul 9;1–10.
226. Ferreira C, Paulino C, Quintas A. Extraction Procedures for Hair Forensic Toxicological Analysis: A Mini-Review. *Chemical Research in Toxicology*. 2019 Nov 8;32(12):2367–81.
227. Usman M, Naseer A, Baig Y, Jamshaid T, Shahwar M, Khurshuid S. Forensic toxicological analysis of hair: a review. *Egyptian Journal of Forensic Sciences*. 2019 Apr 27;9(1).
228. De Leo D, Krysinska K. Suicidal Behaviour by Train Collision in Queensland, 1990–2004. *Australian & New Zealand Journal of Psychiatry*. 2008 Jan 1;42(9):772–9.
229. Andersson A-L, Sokolowski M. Accident or suicide? Improvement in the classification of suicides among road traffic fatalities in Sweden by extended psychosocial investigations, during the years 2010–2019. *Journal of Safety Research*. 2022 Feb;80:39–45.
230. Feigin G. Frequency of Neck Organ Fractures in Hanging. *The American Journal of Forensic Medicine and Pathology*. 1999 Jun;20(2):128–30.
231. O’Carroll PW. A Consideration of the Validity and Reliability of Suicide Mortality Data. *Suicide and Life-Threatening Behavior*. 1989 Mar;19(1):1–16.

232. Hjelmeland H, Dieserud G, Dyregrov K, Knizek BL, Leenaars AA. Psychological Autopsy Studies as Diagnostic Tools: Are They Methodologically Flawed? *Death Studies*. 2012 Aug;36(7):605–26.
233. Brent DA. The Psychological Autopsy: Methodological Considerations for the Study of Adolescent Suicide. *Suicide and Life-Threatening Behavior*. 1989 Mar;19(1):43–57.
234. Isometsä ET. Psychological autopsy studies – a review. *European Psychiatry*. 2001 Nov;16(7):379–85.
235. Lacks RD, Westveer AE, Dibble A, Clemente J. Equivocal Death Investigation: Case Study Analyses. *Victims & Offenders*. 2008 May 14;3(2-3):150–64.
236. Shafii M, Carrigan S, Whittinghill JR, Derrick A Psychological autopsy of completed suicide in children and adolescents. *American Journal of Psychiatry*. 1985 Sep;142(9):1061–4.
237. Marttunen MJ, Aro HM, Lönnqvist JK. Adolescence and suicide: A review of psychological autopsy studies. *European Child & Adolescent Psychiatry*. 1993 Jan;2(1):10–8.
238. Looijmans M, van Bergen D, Gilissen R, Popma A, Balt E, Creemers D, et al. Additional Value of Peer Informants in Psychological Autopsy Studies of Youth Suicides. *Qualitative Health Research*. 2021 Jun 24;31(11):2056–68.
239. Menon V, Varadharajan N, Bascarane S, Subramanian K, Mukherjee M, Kattimani S. Psychological autopsy: Overview of Indian evidence, best practice elements, and a semi-structured interview guide. *Indian Journal of Psychiatry*. 2020;62(6):631.
240. Hawton K, Appleby L, Platt S, Foster T, Cooper J, Malmberg A, Simkin S. The psychological autopsy approach to studying suicide: a review of methodological issues. *Journal of Affective Disorders*. 1998 Sep;50(2-3):269–76.
241. Majid A, Suhaff AA, Khan AW. Psychological Autopsy: Reconstructing the Mystery of Suicide. *Indian Journal of Private Psychiatry*. 2017;11(2):24–5.
242. Saini V. Psychological Autopsy – A Way to Revealing the Enigma of Equivocal Death. *International Journal of Forensic Sciences*. 2017;2(2).
243. Strating C, Mosotho NL, Roux HEL. Psychological autopsy: retrospective exploration of equivocal deaths in Bloemfontein, South Africa. *The Journal of Forensic Psychiatry & Psychology*. 2020 Jun 12;31(4):582–95.
244. Beale EE, Overholser J, Gomez S, Brannam S, Stockmeier CA. The path not taken: Distinguishing individuals who die by suicide from those who die by natural causes despite a percentage d history of suicide attempt. *Journal of Clinical Psychology*. 2021 Jul 31;78(4):526–43.
245. Tandon R. COVID-19 and suicide: Just the facts. Key learnings and guidance for action. *Asian Journal of Psychiatry*. 2021 Jun;60:102695.
246. Mamun MA, Griffiths MD. First COVID-19 suicide case in Bangladesh due to fear of COVID-19 and xenophobia: Possible suicide prevention strategies. *Asian Journal of Psychiatry*. 2020 Jun;51:102073.

247. Fulga I, Neagu M, Piraianu AI, Ciubara BA, Neagu AI, Ciubara A et al. Suicide during COVID-19 infection – Case report and literature review. *Archives of Clinical Psychiatry (São Paulo)*. 2021;48(6): 231-234.
248. Singhal T. A review of coronavirus disease-2019 (COVID-19). *The Indian Journal of Pediatrics*. 2020 Mar 13;87(4):281–6.
249. Dascalu S, Geambasu O, Valentin Raiu C, Azoicai D, Damian Popovici E, Apetrei C. COVID-19 in Romania: What Went Wrong? *Frontiers in Public Health*. 2021 Dec 17;9.
250. Dascalu S, Geambasu O, Covaciu O, Chereches RM, Diaconu G, Dumitra GG, et al. Prospects of COVID-19 Vaccination in Romania: Challenges and Potential Solutions. *Frontiers in Public Health*. 2021 Feb 10;9.
251. Gibson PG, Qin L, Pua SH. COVID -19 acute respiratory distress syndrome (ARDS): clinical features and differences from typical pre- COVID -19 ARDS. *Medical Journal of Australia*. 2020 Jun 22;213(2).
252. Paul O, Tao JQ, West E, Litzky L, Feldman M, Montone K, et al. Pulmonary vascular inflammation with fatal coronavirus disease 2019 (COVID-19): possible role for the NLRP3 inflammasome. *Respiratory Research*. 2022 Feb 10;23(1).
253. Nile SH, Nile A, Qiu J, Li L, Jia X, Kai G. COVID-19: Pathogenesis, cytokine storm and therapeutic potential of interferons. *Cytokine & Growth Factor Reviews*. 2020 May 7;53. doi: 10.1016/j.cytogfr.2020.05.002. PubMed PMID: 32418715. PubMed Central PMCID: PMC7204669.
254. Carsana L, Sonzogni A, Nasr A, Rossi RS, Pellegrinelli A, Zerbi P, et al. Pulmonary post-mortem findings in a series of COVID-19 cases from northern Italy: a two-centre descriptive study. *The Lancet Infectious Diseases*. 2020 Oct;20(10):1135-1140.
255. Batah SS, Fabro AT. Pulmonary pathology of ARDS in COVID-19. A pathological review for clinicians. *Respiratory Medicine*. 2021 Jan 1;176:106239.
256. Pannone G, Caponio VCA, De Stefano IS, Ramunno MA, Meccariello M, Agostinone A, et al. Lung histopathological findings in COVID-19 disease – a systematic review. *Infectious Agents and Cancer*. 2021 May 17;16(1).
257. Desforges M, Le Coupanec A, Brison É, Meessen-Pinard M, Talbot PJ. Neuroinvasive and Neurotropic Human Respiratory Coronaviruses: Potential Neurovirulent Agents in Humans. *Infectious Diseases and Nanomedicine I(Internet)*. 2014 Mar(cited 2022 Feb12);807:75–96. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7121612/>.
258. Gómez-Mesa JE, Galindo-Coral S, Montes MC, Muñoz Martin AJ. Thrombosis and Coagulopathy in COVID-19. *Current Problems in Cardiology*. 2021 Mar 1;46(3):100742.
259. Iba T, Levy JH, Levi M, Thachil J. Coagulopathy in COVID-19. *Journal of Thrombosis and Haemostasis*. 2020 Jul 21;18(9):2103–9.
260. Lorini FL, Di Matteo M, Gritti P, Grazioli L, Benigni A, Zacchetti L, et al. Coagulopathy and COVID-19. *European Heart Journal Supplements(Internet)*. 2021 Oct(cited 2022 Apr 16);23(Supplement_E):E95–8. Available from: https://academic.oup.com/eurheartjsupp/article/23/Supplement_E/E95/6386371.

261. Wan D, Du T, Hong W, Chen L, Que H, Lu S, et al. Neurological complications and infection mechanism of SARS-CoV-2. *Signal Transduction and Targeted Therapy*. 2021 Nov 23;6(1).
262. DosSantos MF, Devalle S, Aran V, Capra D, Roque NR, Coelho-Aguiar J de M, et al. Neuromechanisms of SARS-CoV-2: A Review. *Frontiers in Neuroanatomy*. 2020 Jun 16;14.
263. Wu Y, Xu X, Chen Z, Duan J, Hashimoto K, Yang L, et al. Nervous system involvement after infection with COVID-19 and other coronaviruses. *Brain, Behavior, and Immunity(Internet)*. 2020 Mar(cited 2021 Jun 15);87:18–22. Available from: <https://www.sciencedirect.com/science/article/pii/S0889159120303573?via%3Dihub>.
264. Keyhanian K, Umeton RP, Mohit B, Davoudi V, Hajighasemi F, Ghasemi M. SARS-CoV-2 and nervous system: From pathogenesis to clinical manifestation. *Journal of Neuroimmunology*. 2021 Jan;350:577436.
265. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. *The Lancet Psychiatry*. 2020 May;7(7).
266. Troyer EA, Kohn JN, Hong S. Are we facing a crashing wave of neuropsychiatric sequelae of COVID-19? Neuropsychiatric symptoms and potential immunologic mechanisms. *Brain, Behavior, and Immunity*. 2020 Jul;87:34-39.
267. Koyuncu Orkide O, Hogue Ian B, Enquist Lynn W. Virus Infections in the Nervous System. *Cell Host & Microbe*. 2013 Apr;13(4):379–93.
268. Matías-Guiu J, Gomez-Pinedo U, Montero-Escribano P, Gomez-Iglesias P, Porta-Etessam J, Matias-Guiu JA. ¿Es esperable que haya cuadros neurológicos por la pandemia por SARS-CoV-2? *Neurología*. 2020 Apr;35(3):170–5.
269. Chen R, Wang K, Yu J, Howard D, French L, Chen Z, et al. The Spatial and Cell-Type Distribution of SARS-CoV-2 Receptor ACE2 in the Human and Mouse Brains. *Frontiers in Neurology*. 2021 Jan 20;11.
270. Wan D, Du T, Hong W, Chen L, Que H, Lu S, et al. Neurological complications and infection mechanism of SARS-CoV-2. *Signal Transduction and Targeted Therapy*. 2021 Nov 23;6(1).
271. Linker RA, Lühder F, Kallen K-J, Lee D-H, Engelhardt B, Rose-John S, et al. IL-6 transsignalling modulates the early effector phase of EAE and targets the blood-brain barrier. *Journal of Neuroimmunology*. 2008 Dec;205(1-2):64–72.
272. Conde Cardona G, Quintana Pájaro LD, Quintero Marzola ID, Ramos Villegas Y, Moscote Salazar LR. Neurotropism of SARS-CoV 2: Mechanisms and manifestations. *Journal of the Neurological Sciences(Internet)*. 2020 May(cited 2021 Feb 26);412:116824. Available from: <https://pubmed.ncbi.nlm.nih.gov/32299010/>.
273. Baig AM, Khaleeq A, Ali U, Syeda H. Evidence of the COVID-19 Virus Targeting the CNS: Tissue Distribution, Host–Virus Interaction, and Proposed Neurotropic Mechanisms. *ACS Chemical Neuroscience*. 2020 Apr 1;11(7):995-998.

274. Sasannejad C, Ely EW, Lahiri S. Long-term cognitive impairment after acute respiratory distress syndrome: a review of clinical impact and pathophysiological mechanisms. *Critical Care*. 2019 Nov 12;23(1).
275. Aquila I, Sacco MA, Ricci C, Gratteri S, Ricci P. Quarantine of the COVID-19 pandemic in suicide: A psychological autopsy. *Medico-Legal Journal*. 2020 May 15;002581722092369.
276. Preliminary investigation of the association between COVID-19 and suicidal thoughts and behaviors in the U.S. *Journal of Psychiatric Research*(Internet). 2021 Feb(cited 2022 Apr 12);134:32–8. Available from: <https://www.sciencedirect.com/science/article/pii/S0022395620311456>.
277. Mihalopoulos C, Chatterton ML, Engel L, Le LK-D, Lee YY. Whither economic evaluation in the case of COVID-19: What can the field of mental health economics contribute within the Australian context? *Australian & New Zealand Journal of Psychiatry*. 2020 Oct 2;000486742096372.
278. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The Psychological Impact of Quarantine and How to Reduce it: Rapid Review of the Evidence. *The Lancet*. 2020 Feb 26;395(10227):912–20.
279. Crisan R-M, Bacila CI, Neamtu B, Cristian AN, Topîrcean E, Popescu A, et al. Psychological Autopsy and Forensic Considerations in Completed Suicide of the SARS-CoV-2 Infected Patients. A Case Series and Literature Review. *Applied Sciences*. 2021 Dec 6;11(23):11547.
280. Ho CS, Chee CY, Ho RC. Mental Health Strategies to Combat the Psychological Impact of Coronavirus Disease 2019 (COVID-19) Beyond Paranoia and Panic. *Ann Acad Med Singap*. 2020 Mar 16;49(3):155-160.
281. Khan AR, Ratele K, Arendse N. Men, Suicide, and COVID-19: Critical Masculinity Analyses and Interventions. *Postdigital Science and Education*. 2020;2(3):651–656. doi: 10.1007/s42438-020-00152-1. PMC7314913.
282. Borges G, Garcia JA, Pirkis J, Spittal MJ, Lopez-Arellano O. Suicide After and During the COVID-19 Pandemic in Mexico City. *SSRN Electronic Journal*; 2021.
283. Almaghrebi AH. Risk factors for committing suicide during the COVID-19 pandemic: Identification of the high-risk groups. *Journal of Taibah University Medical Sciences*. 2021 Jun.
284. Mamun MA. Suicide and Suicidal Behaviors in the Context of COVID-19 Pandemic in Bangladesh: A Systematic Review. *Psychology Research and Behavior Management*. 2021;14:695–704.
285. Wollschläger D, Schmidtman I, Blettner M, Ernst V, Fückel S, Caranci N, et al. Suicide during the COVID-19 pandemic in 2020 compared to 2011–2019 in Rhineland-Palatinate (Germany) and Emilia-Romagna (Italy). *Deutsches Ärzteblatt international*. 2021 Nov 26.
286. Palomar-Ciria N, Blanco del Valle P, Hernández-Las Heras MÁ, Martínez-Gallardo R. Schizophrenia and COVID-19 delirium. *Psychiatry Research*(Internet). 2020 Aug(cited

- 2022 Apr 1);290:113137. Available from: <https://www.sciencedirect.com/science/article/abs/pii/S0165178120315754>.
287. Kahil K, Cheaito MA, El Hayek R, Nofal M, El Halabi S, Kudva KG, et al. Suicide during COVID-19 and other major international respiratory outbreaks: A systematic review. *Asian Journal of Psychiatry*(Internet). 2021 Feb(cited 2021 Feb 25);56:102509. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7764387/>.
288. Kozloff N, Mulsant BH, Stergiopoulos V, Voineskos AN. The COVID-19 Global Pandemic: Implications for People with Schizophrenia and Related Disorders. *Schizophrenia Bulletin*. 2020 Apr 28;46(4).
289. Neelam K, Duddu V, Anyim N, Neelam J, Lewis S. Pandemics and Pre-existing Mental Illness: A Systematic Review and Meta-analysis. *Brain, Behavior, & Immunity - Health*. 2020 Nov;10:100177.
290. Crişan RM, Băcilă CI, Morar S. The role of psychological autopsy in investigating a case of atypical suicide in schizophrenia: a case report with a brief review of literature. *Egyptian Journal of Forensic Sciences*. 2022 Jul 6;12(1).
291. Sher L. Psychiatric disorders and suicide in the COVID-19 era. *QJM: An International Journal of Medicine*. 2020 Jun 18;113(8):527–8.
292. Sansone RA, Sansone LA. Physician suicide: a fleeting moment of despair. *Psychiatry* (Edgmont). 2009 Jan;6(1):18-22.
293. Levine J, Sher L. Interdisciplinary Approach and Suicide Prevention Amongst U.S. Military Veterans. *Psychiatr Danub*. 2021 Summer;33(2):200.
294. Kawohl W, Nordt C. COVID-19, unemployment, and suicide. *The Lancet Psychiatry*(Internet). 2020 May(cited 2021 Feb 16);7(5):389–90. Available from: [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30141-3/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30141-3/fulltext).
295. Barchielli B, Cricenti C, Gallè F, Sabella EA, Liguori F, Da Molin G, et al. Climate Changes, Natural Resources Depletion, COVID-19 Pandemic, and Russian-Ukrainian War: What Is the Impact on Habits Change and Mental Health? *International Journal of Environmental Research and Public Health*(Internet). 2022 Jan(cited 2022 Oct 6);19(19):11929. Available from: <https://www.mdpi.com/1660-4601/19/19/11929/htm>.
296. Almaghrebi AH. Risk factors for committing suicide during the COVID-19 pandemic: Identification of the high-risk groups. *Journal of Taibah University Medical Sciences*; 2021 Jun.
297. Conejero I, Berrouiguet S, Ducasse D, Leboyer M, Jardon V, Olié E, et al. Épidémie de COVID-19 et prise en charge des conduites suicidaires: challenge et perspectives. *L'Encéphale*. 2020 Jun;46(3):S66–72.
298. Dubé JP, Smith MM, Sherry SB, Hewitt PL, Stewart SH. Suicide behaviors during the COVID-19 pandemic: A meta-analysis of 54 studies. *Psychiatry Research*. 2021 Jul;301:113998.
299. Moutier C. Suicide Prevention in the COVID-19 Era. *JAMA Psychiatry*. 2020 Oct 16;78(4).
300. Farooq S, Tunmore J, Ali W, Ayub M. Suicide, self-harm and suicidal ideation during COVID-19: A systematic review. *Psychiatry Research*. 2021 Dec;306:114228.

301. Gunnell D, Appleby L, Arensman E, Hawton K, John A, Kapur N, et al. Suicide risk and prevention during the COVID-19 pandemic. *The Lancet Psychiatry*(Internet). 2020 Apr(cited 2021 Oct 14). Available from: [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30171-1/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30171-1/fulltext).
302. Crisan RM, Băcilă CI, Toboltoc PC, Morar S. Completed Suicide Linked to the COVID-19 Pandemic by Using the Psychological Autopsy Method in Sibiu County, Romania: Case Series and Literature Review. *Healthcare*. 2022 Nov 26;10(12):2377.
303. Goyal K, Chauhan P, Chhikara K, Gupta P, Singh MP. Fear of COVID 2019: First suicidal case in India! *Asian Journal of Psychiatry*. 2020 Mar;49:101989.
304. Sahoo S, Rani S, Parveen S, Pal Singh A, Mehra A, Chakrabarti S, et al. Self-harm and COVID-19 Pandemic: An emerging concern – A report of 2 cases from India. *Asian Journal of Psychiatry*. 2020 Jun;51:102104.
305. Ojimba C, Tumenta T, Thanju A, Oforeh K, Osaji J, Saha A, et al. COVID-19 Pandemic and Uptake in Suicide Attempt Among Young People of Minority Population: A Case Series. *Journal of Medical Cases*. 2020;11(12):411–6.
306. Gimbrone C, Rutherford C, Kandula S, Martínez-Alés G, Shaman J, Olfson M, et al. Associations between COVID-19 mobility restrictions and economic, mental health, and suicide-related concerns in the US using cellular phone GPS and Google search volume data. Kardeş S, editor. *PLoS ONE*. 2021 Dec 22;16(12):e0260931.
307. Turecki G, Brent DA. Suicide and suicidal behaviour. *The Lancet*(Internet). 2016 Mar(cited 2021 Oct 5);387(10024):1227–39. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5319859/>.
308. Deisenhammer EA, Kemmler G. Decreased suicide numbers during the first 6 months of the COVID-19 pandemic. *Psychiatry Research*. 2020 Dec;113623.
309. Kim AM. The short-term impact of the COVID-19 outbreak on suicides in Korea. *Psychiatry Res*. 2021 Jan;295:113632.
310. Leske S, Kõlves K, Crompton D, Arensman E, Leo D de. Real-time suicide mortality data from police reports in Queensland, Australia, during the COVID-19 pandemic: an interrupted time-series analysis. *The Lancet Psychiatry*(Internet). 2020 Nov(cited 2021 Apr 4). Available from: [https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(20\)30435-1/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(20)30435-1/fulltext).
311. Mitchell TO, Li L. State-Level Data on Suicide Mortality During COVID-19 Quarantine: Early Evidence of a Disproportionate Impact on Racial Minorities. *Psychiatry Research*. 2021 Jan;295:113629.
312. Bone AE, Finucane AM, Leniz J, Higginson IJ, Sleeman KE. Changing patterns of mortality during the COVID-19 pandemic: Population-based modelling to understand palliative care implications. *Palliative Medicine*. 2020 Jul 24;34(9):1193–201.
313. Calderon-Anyosa RJC, Kaufman JS. Impact of COVID-19 lockdown policy on homicide, suicide, and motor vehicle deaths in Peru. *Preventive Medicine*. 2021 Feb;143:106331.

314. Gunnell D, Bennewith O, Hawton K, Simkin S, Kapur N. The epidemiology and prevention of suicide by hanging: a systematic review. *International Journal of Epidemiology*. 2005 Jan 19;34(2):433–42.
315. Caba IC, Ștreangă V, Dobrin ME, Jităreanu C, Jităreanu A, Profire BȘ, et al. Clinical Assessment of Acute Organophosphorus Pesticide Poisoning in Pediatric Patients Admitted to the Toxicology Emergency Department. *Toxics*. 2022 Oct 2;10(10):582.
316. Chatterjee SS, Barikar CM, Mukherjee A. Impact of COVID-19 pandemic on pre-existing mental health problems. *Asian Journal of Psychiatry*. 2020 Jun;51:102071.
317. World Health Organization. COVID-19 disrupting mental health services in most countries, WHO survey(Internet). www.who.int. 2020.(cited 2021 Dec 26). Available from: <https://www.who.int/news/item/05-10-2020-COVID-19-disrupting-mental-health-services-in-most-countries-who-survey>.
318. Williams R, Jenkins DA, Ashcroft DM, Brown B, Campbell S, Carr MJ, et al. Diagnosis of physical and mental health conditions in primary care during the COVID-19 pandemic: a retrospective cohort study. *The Lancet Public Health*. 2020 Oct;5(10):e543–50.
319. Moynihan R, Sanders S, Michaleff ZA, Scott AM, Clark J, To EJ, et al. Impact of COVID-19 Pandemic on Utilisation of Healthcare services: a Systematic Review. *BMJ Open*. 2021 Mar 1;11(3):e045343.
320. Hossain MM, Tasnim S, Sultana A, Faizah F, Mazumder H, Zou L, et al. Epidemiology of mental health problems in COVID-19: a review. *F1000Research*. 2020 Jun 23;9(1):636.
321. Sher L. Individuals with untreated psychiatric disorders and suicide in the COVID-19 era. *Brazilian Journal of Psychiatry*. 2020 Jul 17;43(3):229-230.
322. Ornell F, Borelli WV, Benezano D, Schuch JB, Moura HF, Sordi AO, et al. The next pandemic: impact of COVID-19 in mental healthcare assistance in a nationwide epidemiological study. *The Lancet Regional Health - Americas*. 2021 Sep;100061.
323. Wu T, Jia X, Shi H, Niu J, Yin X, Xie J, et al. Prevalence of mental health problems during the COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Affective Disorders*. 2021 Feb;281:91–8.
324. Phiri P, Ramakrishnan R, Rathod S, Elliot K, Thayanandan T, Sandle N, et al. An evaluation of the mental health impact of SARS-CoV-2 on patients, general public and healthcare professionals: A systematic review and meta-analysis. *EClinicalMedicine*(Internet). 2021 Apr(cited 2022 May 13);34. Available from: [https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370\(21\)00086-9/fulltext](https://www.thelancet.com/journals/eclinm/article/PIIS2589-5370(21)00086-9/fulltext).
325. Romania Suicide Rate 2000-2023(Internet). www.macrotrends.net.(cited 2022 Dec 21). Available from: <https://www.macrotrends.net/countries/ROU/romania/suicide-rate>.
326. Pandemia de COVID-19 a dus la creșterea ratelor de sinucidere în rândul tinerilor europeni(Internet). *EurActiv | Știri, politici europene & Actori UE online*.(cited 2022 Dec 21). Available from: <https://www.euractiv.ro/social/suicid-pandemie-deprehub-26817>.

327. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. *The Lancet Psychiatry*. 2020 Apr;7(6):547–60.
328. Padubidri J R, Rao S J, Dutt A, Shetty B S K, Boloor A. Psychological Autopsy- Unraveling the Mystery of Death. *Austin J. Forensic Sci. Criminol*. 2015;2(3):1025.
329. Bastia BK, Kar N. A Psychological Autopsy Study of Suicidal Hanging from Cuttack, India: Focus on Stressful Life Situations. *Archives of Suicide Research*. 2009 Jan 9;13(1):100–4.
330. Pfefferbaum B, North CS. Mental Health and the COVID-19 Pandemic. *New England Journal of Medicine*. 2020 Apr 13;383(6):510–2.
331. Nicola M, Alsafi Z, Sohrabi C, Kerwan A, Al-Jabir A, Iosifidis C, et al. The Socio-Economic Implications of the Coronavirus and COVID-19 Pandemic: A Review. *International Journal of Surgery*. 2020 Apr 17;78:185–93.