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# BIOLOGICAL PSYCHIATRY AND PSYCHOPHARMACOLOGY

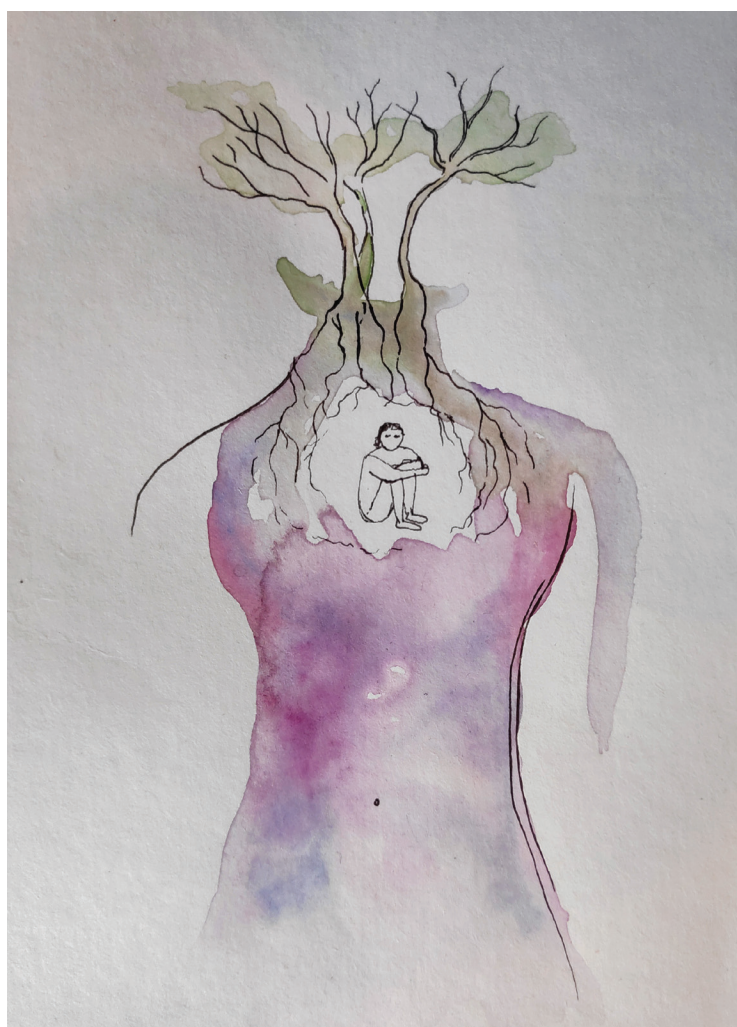
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## BIOLOGINĖ PSICHIATRIJA IR PSICHOFARMAKOLOGIJA

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## COVID-19 and the Brain

COVID-19 pandemic has presented societies with unprecedented health and social challenges that continue to evolve. There is an accumulating body of evidence that COVID-19 associated stress and fear, economic and social uncertainties, and implementation of strict social isolation strategies cause serious mental health problems, such as depression, anxiety, stress related disorders and addictions among other. Increasing incidence of the COVID-19 associated undiagnosed and untreated mental health disorders can subsequently impair work productivity and post-COVID-19 economic recovery resulting in stress and mental health problems causing a vicious circle. Mental health sequelae of prolonged social isolation and deprivation of meaningful social contacts can also carry its toll for the young generation for years to come. COVID-19 imposed mental health challenges threaten to overburden already limited mental health resources. Thus, there is an urgent need to adapt the existing healthcare systems and to implement novel and innovative approaches to meet the growing demand for mental health services, especially for the most vulnerable populations.

Aside from stress induced mental health problems, there is already some evidence that the SARS-CoV-2 virus can have neuroinvasive potential. For example, a substantial proportion of COVID-19 patients experience neurological symptoms, the SARS-CoV-2 RNA was detected in the cerebrospinal fluid and angiotensin-converting enzyme (ACE) 2, which is used by the SARS-CoV-2 virus to access cells, is expressed in neurons and glial cells. Further research will help to unveil more light whether the SARS-CoV-2 can cause clinically meaningful CNS damage and disturbance of normal brain functioning.

This special issue of the Journal was initiated in the pre-COVID-19 era with goal to review management of depression in Lithuania. As it turned out, the need for this knowledge is more important now than it was before. In this issue, we present a balanced review of epidemiology of depression and suicide ideation in Lithuania, discuss depression assessment scales used in Lithuania, review depression management in primary care setting in Lithuania and Latvia, analyze academic productivity of psychiatrists in Lithuania, and also investigate suicidal ideation in medical students in Lithuania.

I would like to cordially thank authors and editorial team members for their efforts to construct this timely and important special issue.

Please keep safe and well.

Sincerely,

Adomas Bunevicius MD, PhD

# Suicide and Depression: Epidemiology in Lithuania

## Savižudybės ir depresija: epidemiologija Lietuvoje

Vilma LIAUGAUDAITĖ<sup>1</sup>, Nida ZEMAITIENĖ<sup>2</sup>, Adomas BUNEVIČIUS<sup>1</sup>

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### SUMMARY

Suicide is a complex, multidimensional and multi-causal phenomenon which can be described from different approaches and perspectives. Most suicides are related to mental disorders, especially with depression. Depression also known to be the most common disorder among people who die by suicide. Lithuania has the highest suicide rate in the EU, which poses a serious challenge to mental health services.

**The objective** of the present report was to review the statistical data of suicide and depression, risk factors, and to discuss possible suicide prevention methods, based on national and international literature.

**Methods.** Analysis of statistical data of suicide mortality and morbidity of depression was based on a literature search of the World Health Organization (WHO), Eurostat, Health Statistics/Institute of Hygiene in Lithuania databases.

**Results and conclusions.** The analysis of statistical data showed that despite a recent decline in suicide mortality in Lithuania, suicide remains one of the leading causes of death in the working age population, particularly men. In Lithuania, there is still a large gap in the number of suicides in urban and rural areas. Suicide rates are also high among vulnerable groups include mid-aged (45–59 years) and over 75 years old males, living in rural area. Men are five times more likely than women to commit suicide, while women are more likely to experience suicidal attempts. Almost ten percent are people with depression in Lithuania, and a quarter have had of depressive episodes at some point in their lives. Depression is a treatable condition but about 50% of cases of major depression still go untreated. This implies that mortality of suicide could be reduced by preventing depression and by recognizing and adequately treating it. A broad array of suicide prevention strategies addressing different risk factors at various levels is recommended to achieve an overall reduction in the population's long-term suicide rate. To address inequalities in the number of suicides between major cities of Lithuania and district municipalities located in remote regions of the country, municipalities are developing rapid intervention algorithms.

**Keywords.** suicide, depression, mental health

### SANTRAUKA

Savižudybė yra sudėtingas, daugialypis ir daugiaveiksnis reiškinys, kurį galima apibūdinti iš skirtingų požiūrių ir perspektyvų. Dažnai savižudybės yra susijusios su psichikos sutrikimais, ypač su depresija. Depresija yra žinomas kaip labiausiai paplitęs psichikos sutrikimas tarp žmonių, kurie miršta nuo savižudybės. Lietuva turi didžiausią savižudybių skaičių Europos Sąjungoje, ir tai kelia rimtą iššūkį šalies psichikos sveikatos tarnyboms.

**Darbo tikslas** – remiantis nacionaline ir tarptautine literatūra, apžvelgti savižudybių ir depresijos statistinius duomenis, rizikos veiksnius, bei aptarti galimus savižudybių prevencijos metodus.

**Metodika.** Savižudybių mirtingumo ir depresijos sergamumo rodiklių statistinių duomenų analizė atlikta naudojantis Pasaulio sveikatos organizacijos (PSO), Eurostat, ir Higienos instituto duomenimis.

**Rezultatai ir išvados.** Atlikus statistinių duomenų apžvalgą, pastebėta, kad nepaisant pastaruoju metu sumažėjusio savižudybių skaičiaus Lietuvoje, savižudybės vis dar išlieka viena pagrindine darbingo amžiaus žmonių, ypač vyrų, mirties priežastimi. Lietuvoje išlikęs didelis savižudybių skaičiaus atotrūkis tarp miesto ir kaimo. Didžiausia savižudybės rizika yra vidutinio amžiaus (45–59 metų) ir vyresniems nei 75 metų vyrams, gyvenantiems kaime. Vyrų nusižudo penkis kartus dažniau nei moterų, tačiau moterų kelis kartus dažniau bando nusižudyti. Lietuvoje yra apie 10 proc. sergančių depresija, o kada nors gyvenime turėję depresijos epizodų yra ketvirtadalis. Depresija yra išgydoma liga, tačiau beveik pusę depresija sergančių asmenų negauna tinkamo gydymo. Todėl galima formuoti hipotezę, kad savižudybių mirtingumą būtų galima sumažinti užkertant kelią depresijai, laiku diagnozuojant bei tinkamai ją gydant. Norint pasiekti ilgalaikį savižudybių mirtingumo rodiklių sumažėjimą, rekomenduojamos plataus masto savižudybių prevencijos strategijos, išskiriant konkrečius veiksmus atliktinus tiek bendrojoje populiacijoje, tiek individualiame lygmenyje. Savižudybių skaičiaus netolygumų mažinimui tarp didžiųjų Lietuvos miestų bei rajonų savivaldybių, esančių atokiuose regionuose, Lietuvos savivaldybėse kuriami ir diegiami greito įsikišimo algoritmai.

**Raktiniai žodžiai:** savižudybė, depresija, psichikos sveikata

**Corresponding author:** Vilma Liaugaudaitė, Lithuanian University of Health Sciences, Neuroscience Institute, Laboratory of Behavioral Medicine, Vyduo 4, Palanga LT-00135, Lithuania. E-mail: vilma.liaugaudaitė@lsmuni.lt

## INTRODUCTION

Good mental health is a critical part of individual well-being, and the foundation for happy, fulfilled and productive lives [1]. The economic costs of mental illness are also significant. Mental health problems cover a wide range of illnesses, including mild or moderate anxiety, depressive disorders, drug and alcohol use disorders, and more severe disorders such as, bipolar disorders and schizophrenia. Mental disorders are one of the top public health challenges in the European Region, affecting about 25% of the population every year [2]. In the European Region, depression affects around 40 million people, or 4.3% of the population. Regional average (not age standardized) of depressive disorders in Lithuania according to the WHO in 04/2017 was 5.6% [3]. Depression limits a person's ability to fully function at work or school and to cope with daily life. This also leads to enormous economic losses; in the European Union, the cost of lost productivity due to depression has been estimated at over €70 billion per year [4].

Despite being very common and affecting anyone at any stage of life, depression is still under-recognized and undertreated [5]; there is, consequently, a need to open up dialogue and tackle the stigma associated with this highly disabling condition. Depression is a major challenge to health in the European Region. Depression is a treatable condition but about 50% of cases of major depression still go untreated [6]. Yet, 3 out of 4 people who suffer from depression do not receive adequate treatment, therefore WHO works to raise awareness of the consequences of depression and self-harm, to reduce stigma and discrimination, and to improve access to health care. It supports countries' efforts to scale up services for depression in nonspecialized health-care settings as part of an integrated approach to chronic disease management [7]. The European Mental Health Action Plan 2013–2020 encourages Member States to develop and implement

evidence-based suicide prevention strategies that combine a universal approach with activities to protect vulnerable groups [8].

At its worst, it can lead to suicide. Depression is a primary cause of suicide deaths. Suicide is a serious global public health problem that demands our attention but preventing suicide is no easy task [9]. It contributes to premature death, morbidity, lost productivity, and health care costs [10]. Although the suicide rate in Lithuania is on a consistent decline, the overall number of people taking their own lives remains high, highlighting the problems in the mental healthcare system [11, 12]. Lithuania ranks the fourth in the world according to suicide rate, and it has a second rank for the male suicide rate among all countries in the world [13].

## EPIDEMIOLOGY

The number of suicides is one of the most important indicators of the public's state of mental health. Lithuania is one of the top countries in terms of suicide rate. According to data provided by the Institute of Hygiene in Lithuania, 683 people committed suicide in 2018, down from 748 in 2017, 823 in 2016, 891 in 2015, 935 in 2014 and 1.085 in 2013 [12]. Since 2004, the standardized mortality rate (SMR) (the number of deceased individuals per 100,000 residents in accordance with the European Standard) per 100,000 Lithuanian residents due to suicide, which was at 42.89 during that year, started to go down – in 2013, it was 36.68 (Figure 1) [14]. According to the Eurostat data, the average rate of death by suicide in the EU in 2014 was 11.7 (per 100,000 residents), while the SMR in Lithuania was 31.71 (per 100,000 residents) and exceeded the European Union average three times [15,16]. In 2015 it was at 30.84, which means it remained largely unchanged for three years. The suicide rate has also declined over the past few years from 30.84 suicides per 100,000 population in 2015 to 28.69 in 2016, and 26.45 in 2017 and 24.4 in 2018 [12].

The Organization for Economic Cooperation and

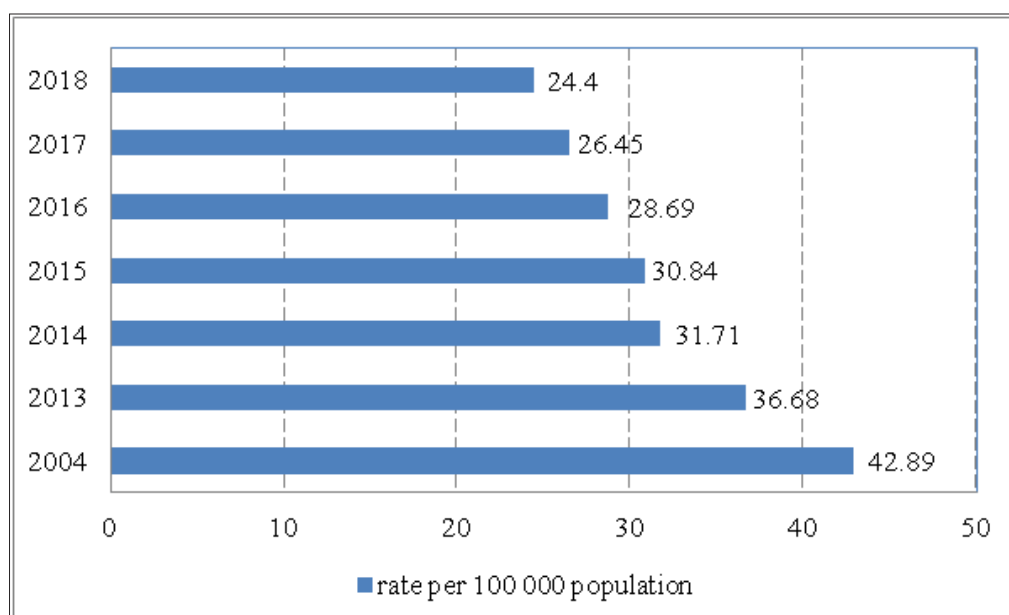


Figure 1. Age-standardized suicide rates (per 100 000 population) in Lithuania in 2004–2018



Development (OECD) notes that Lithuania's high suicide rate is tied to many different factors, including rapid social and economic changes which increase both psychological and social insecurity, as well as the lack of a national suicide prevention strategy [14].

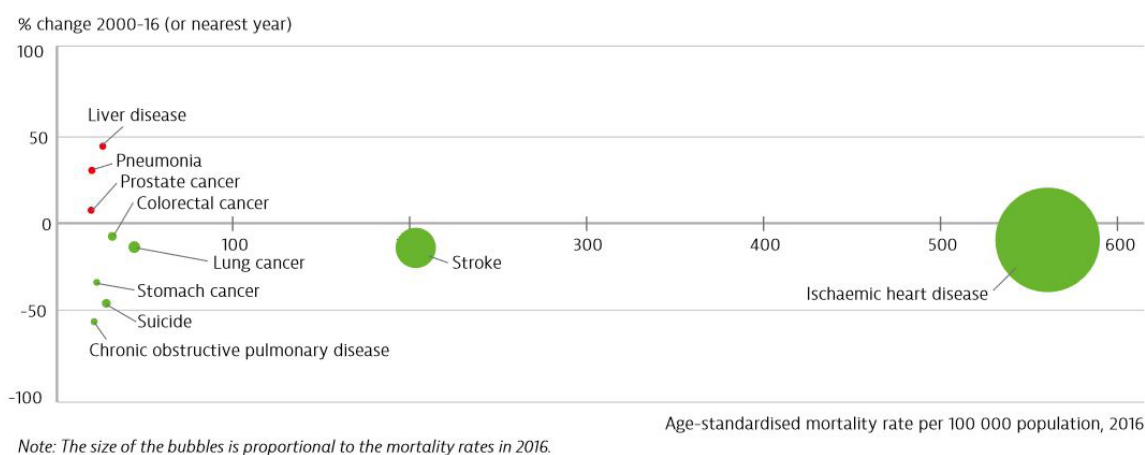
In recent years, the authorities have launched a number of suicide prevention campaigns, social and economic conditions have also changed, that led to a 45% decrease in the number of deaths due to suicide between 2000 and 2016 (Figure 2), but is still more than double the OECD average for the general population and nearly three-times the OECD average for men (Figure 3) [17]. It is estimated that more than half of all deaths in Lithuania can be attributed to behavioral risk factors, including dietary risks (32%; vs. EU: 18%), tobacco smoking (15%; vs. EU: 17%), alcohol consumption (10%; vs. EU: 6%) and low physical activity (5%; vs. EU: 3%). This proportion is far above the 39 % EU average. Mortality from ischemic heart disease, suicides and alcohol-related causes was the highest in the EU. Many of the leading causes of death – including cardiovascular diseases, liver diseases, accidental poisoning and road traffic deaths – are associated with high alcohol consumption, and Lithuania has recently introduced new alcohol control policies (Figure 2) [17].

Looking at trends in more specific causes of death, ischemic heart diseases and stroke remain the top two causes of death in Lithuania (Figure 2), with mortality rates four and two times above the EU average respectively. Lung cancer is now the third leading cause of death, a legacy of high smoking rates. Lithuania also has the highest suicide rate in the EU, which poses a serious challenge to mental health services. Colorectal and prostate cancers, as well as liver disease, have climbed in the list of leading causes of deaths between 2000 and 2016.

Globally, suicides are the second leading cause of premature mortality in individuals aged 15 to 29 years (preceded by traffic accidents), and number three in the age-group 15–44 years [18]. According to recent review of Bachmann et al (2018) crude and age-standardized suicide

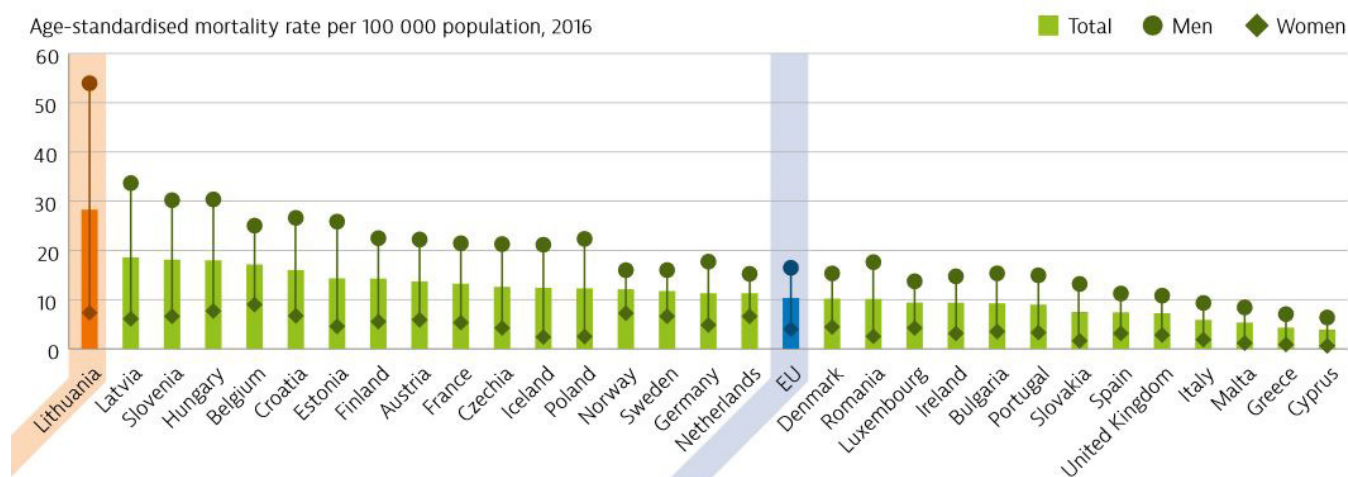
rates according to WHO regions, both rates amount to 10.7 per 100,000 worldwide but fall apart in certain regions. The Eastern Mediterranean region has suicide rates of 3.8 and 4.3, the African region 8.8 and 12.8, the Americas 9.6 and 9.1, the Western Pacific region 10.8 and 9.1, South East Asia 12.9 and 13.3, and Europe 14.1 and 11.9 (all crude and age-standardized) [19].

The highest suicide rates for both men and women are found in Europe, more particularly in Eastern Europe, in a group of countries that share similar historical and sociocultural characteristics, such as Estonia, Latvia, Lithuania and, to a lesser extent, Finland, Hungary and the Russian Federation [18]. Obviously, the European area presents the highest absolute or crude suicide rate, namely above the global suicide rate of 10.7 for both genders. This is the case despite the fact that, since 1980, a drop in suicide rates was reached through preventive measures and assisted suicides were taken out of the statistics. On the other hand, however, data quality is much better in comparison to other regions of the world, and fewer incidents are lacking in the statistics [18, 20]. Although there is some progress in reducing historically high mortality rates from suicide, it nevertheless remains an important cause of death, particularly among men, as Lithuania recorded the highest rate of mortality from this cause in the EU in 2016. The largest absolute gender gap in 2016 was in Lithuania, where the rate for men was 54.5 per 100 000 inhabitants compared with 7.8 per 100 000 inhabitants for women (Figure 3). The most vulnerable groups include mid-aged (45–59 years) and over 75 years old males living in rural and socially isolated environment. Men are five times more likely than women to commit suicide, so municipalities are developing rapid intervention algorithms to address this trend [12]. However, taking a simple ratio between the rates for men and women showed that in Poland, the rate for men was 7.6 times as high as the rate for women. This ratio between the gender was lowest in Luxembourg, Belgium, Sweden and the Netherlands, where standardized death rates for suicide for men were at most 3.0 times as high as those for women [17]. It



Source: [17] OECD/EU (2018), *Health at a Glance: Europe 2018: State of Health in the EU Cycle*, OECD Publishing, Paris. Available online: [https://doi.org/10.1787/health\\_glance\\_eur-2018-en](https://doi.org/10.1787/health_glance_eur-2018-en)

Figure 2. Top 10 causes of death in 2016 and percent change, 2000–2016, all ages, number in Lithuania



Source: [17] OECD/EU (2018), *Health at a Glance: Europe 2018: State of Health in the EU Cycle*, OECD Publishing, Paris. Available online: [https://doi.org/10.1787/health\\_glance\\_eur-2018-en](https://doi.org/10.1787/health_glance_eur-2018-en)

Figure 3. Suicide is a serious public health concern in Lithuania, particularly for men

was estimated, that nearly three times as many men as women die by suicide in high-income countries, in contrast to low- and middle-income countries, where the rate is more equal.

It is very difficult to obtain reliable data on suicide rates. However, assuring rates of suicide attempts is nearly impossible, not least because a suicide attempt may not come to anyone's attention, much less to the attention of the health care system. Nevertheless, the registration of suicides and suicide attempts is a desirable goal towards better prevention, detection, and intervention [18].

### MENTAL HEALTH SERVICES

Although Lithuania's mortality rate by suicide has come down over the past decade, in 2017 it was still the highest reported in the EU, which poses a serious challenge to mental health services.

According to Mental Health ATLAS 2017 Lithuania profile burden of mental disorders (WHO official estimates) expressed as 4,425.98 disability-adjusted life years (per 100,000 population) [4]. The largest proportion of physical and human capital is concentrated in psychiatric institutions, with large numbers of beds, psychiatrists and increasing funding for medications. Many strategies have been developed in Lithuania not only to prevent suicide but also to detect depression symptoms earlier and provide more appropriate treatment for other mental health issues [17].

Over the last 15 years, a substantial share of institutionalized psychiatric and substance abuse services has moved into general hospitals and outpatient mental health centers to reduce the stigma associated with mental health disorders. The provision of mental health care center has been considerably restructured, with specialized primary care providers playing an increasing role. Patients can be referred to these primary mental health services by their GP or the hospital, but they can also access them directly [17].

Data in Table 1 demonstrate the human resources for mental health and mental health service availability and

uptake.

At the primary care level, services are delivered in 115 mental health care centers (Table 1), which are sometimes co-located with primary care centers. Most centers consist of multidisciplinary teams, including psychiatrists, psychologists, mental health nurses, and social workers.

In 2015, the European Union (EU) had around 90 000 psychiatrists in total (Figure 4). The majority practiced in Finland, Sweden, the Netherlands and France. According to data, Lithuania has retained a high number of psychiatrists (225 per million inhabitants) [15].

Despite retained a high number of psychiatrists in Lithuania, accessibility of services at mental health centers are uneven. Due to differences in the workload of mental health specialists, and the failure to ensure team work, coordination across different health care providers remains a major issue. The availability of mental health and primary care services does not systematically translate into a functional team approach with effective mechanisms to detect illness early and meet patients' needs. Coordination between hospital and outpatient care is also insufficient. Despite access to pharmacological treatment, psychosocial treatment to recovery to be missing.

This may explain, at least in part, why inpatient deaths from suicide among patients hospitalised with a mental disorder, as well as suicide rates one month and one year after hospitalisation, are also substantially higher than in neighbouring countries. Other components of care such as housing, psychosocial and vocational rehabilitation, community based mental health services should be developed.

In 2017, the National Audit Office called for renewed efforts to identify and support individuals at risk of mental health issues and to ensure immediate and continuous support to people who have attempted suicide, emphasizing the need for information sharing between institutions [21].

On 1st November 2018, Lithuanian Health Minister order stated the procedure for providing help of suicide survivors. The document includes prepared goals to increase training

**Table 1. Human resources for mental health and mental health service availability and uptake**

Resource	
Total number of mental health professionals (gov. and non gov.)	2,558
Psychiatrists per 100,000	8.45
Child psychiatrists per 100,000 (gov. and non gov.)	3.17
Psychologists per 100,000	15.86
Mental health nurses	49.76
“Community-based / non-hospital” mental health outpatient facility	115
Inpatient care (total facilities)	
Mental hospitals	4
Psychiatric units in general hospital	20
Inpatient care (per 100,000 population)	1
Mental hospital beds/annual admissions	40.18/364.33
General hospital psychiatric unit beds/annual admissions	49.59/767.41
Forensic inpatient unit beds/annual admissions	1.50/4.98
Mental hospitals	
Total number of inpatients	2,063
Admissions that are involuntary	755
Mental hospitals (length of stay)	
Inpatients staying less than 1 year	89%
Inpatients staying 1–5 years	9.4%
Inpatients staying more than 5 years	2.0%

Source: [15] EUROSTAT (European statistics). Available online: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20171010-1>

for key gatekeepers, volunteers, and professionals regarding recognition of risk factors, warning signs and at-risk behaviours; to provide effective interventions; and to develop and promote effective clinical and professional practice to support clients, families and communities. Psychosocial assessment can be a vital tool for self-harm management, for engaging patients in treatment and improving their rates of aftercare.

A recent Lithuanian Health Minister order states that, from November 2019, new health care services will be provided in mental health care institutions to children and adolescents. In addition, the network of institutions providing psychiatric day care treatment will expand from five institutions to ten. Since 2019, the Ministry also started financing municipal Public Health Bureaus to promote mental health prevention in schools. The objectives of this program are to enhance the competences of school staff in detecting and addressing mental health issues and improve overall mental health literacy.

According to data provided by the State Patients' Fund, the number of visits to medical psychologists in clinics

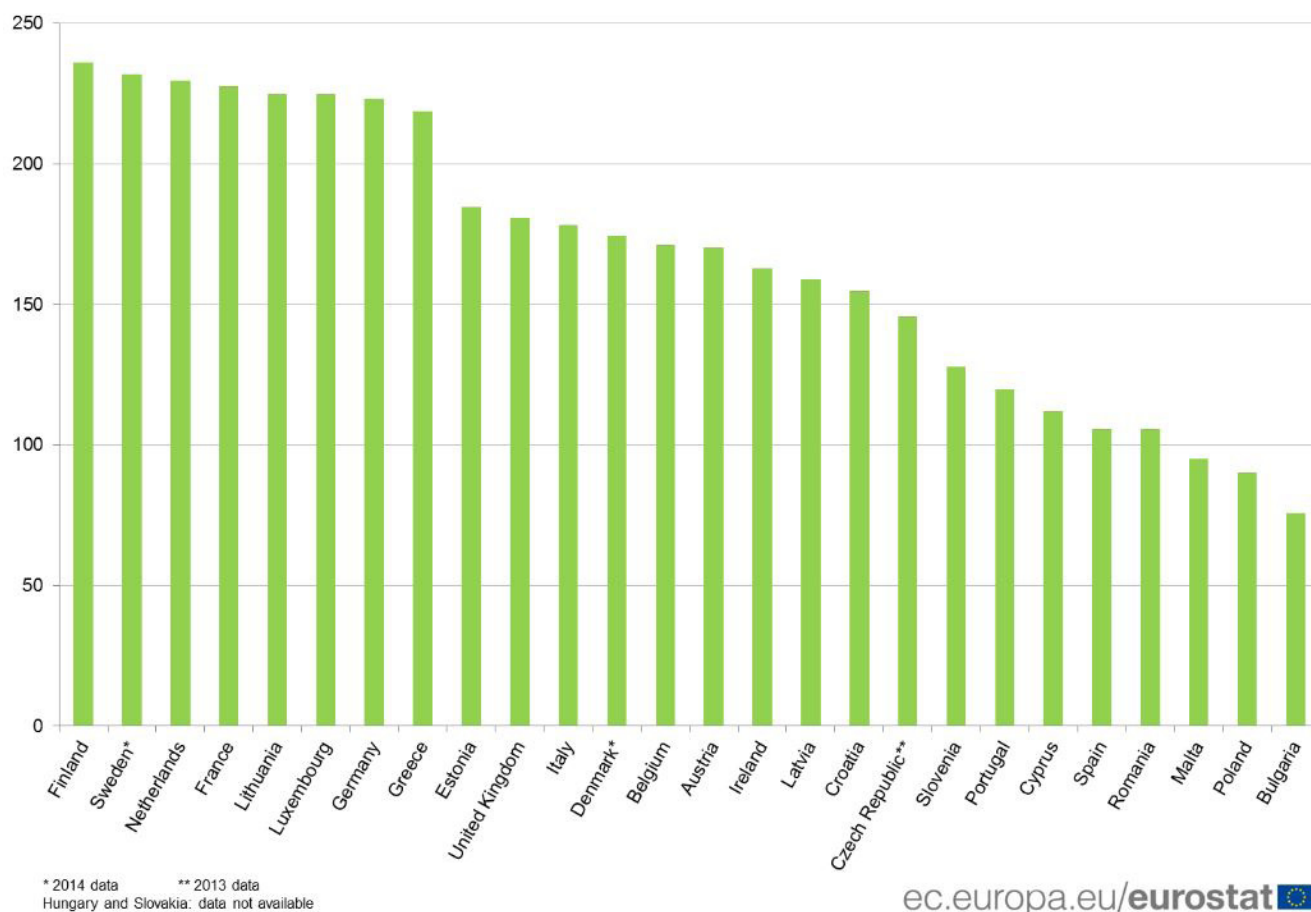
has tripled over the past three years – from 20,959 in 2014 to 65,000 in 2017. The support from other people during a suicidal crisis is one of the strongest suicide deterrents [22]. Unfortunately, individuals with suicide behavior often avoid seeking help from others [23]. Thus, it is very important to understand reasons for this avoidance better. The question of how to improve the interaction between those who can help and those who need help is open until now. Early detection of any disease or disorder can help prevent the condition from worsening. Yet all too often, people do not seek medical attention when they are struggling with early signs of mental illness. They may fear being labeled as mentally ill or crazy, or they don't believe anyone can help them. Perhaps they have had previous negative experiences in the health care system, or ineffective treatment. Too often, the stigma associated with mental illness and suicide both deter and prevent many people from obtaining the necessary resources and health care that will thwart and lower the risks for suicide [24]. Research in the field of psychiatry and mental health is not very well developed, mainly because of a lack of research capacity and the absence of research institutions in these fields.

### DEPRESSION AND SUICIDE

Depression is the leading cause of death of suicide worldwide and is number two in years lived with disability (globally up to 11%) [8, 25]. Study of Bradvik (2018) showed that the majority of suicides are related to a psychiatric condition, including depression, substance use disorders, and psychosis [26]. Other research suggests that the suicide risk for mental disorders including depression, alcoholism, and schizophrenia is around 5% to 8%, while up to 60% of people who commit suicide have depression [27]. In 2017, the proportion of people reporting depression in Lithuania was 4.7%, while 7.1 % in the EU-28 population (Figure 5). With 12.1%, Ireland topped the ranking for the share of its population reporting chronic depression, while double-digit shares were also recorded in Portugal, Germany and Finland; an even higher share was recorded in Iceland (14.8 %), while Turkey also recorded a double-digit share (11%). The proportion of people reporting depression was less than 4% in the Czech Republic, Cyprus, Bulgaria and Romania [28].

Looking across the age groups from youngest to oldest, the share of people reporting depression generally increased with age (data not shown). There was a relatively low prevalence of chronic depression among the young (compared with most other diseases). The only exception to the pattern of increasing prevalence with age was for the class covering those aged 65–74 years, where the prevalence of depression was lower than for people aged 45–54 and 55–64 years [28]. Longitudinal studies have consistently demonstrated the importance of past suicide attempts, cigarette smoking, alcohol use disorders, and comorbid personality disorder as predictors of future suicide attempts in depressed populations [29, 30]. The most important risk factor for lifetime suicide attempt is depression, with a population attributable risk proportion of around 28%. This implies that the lifetime prevalence of suicide attempts could be reduced significantly by preventing depression and by recognizing and adequately treating it [31, 32].





Source: [15] EUROSTAT (European statistics). Available online: <https://ec.europa.eu/eurostat/web/products-eurostat-news/-/EDN-20171010-1>

Figure 4. Number of psychiatrists per million inhabitants in the EU Member States, 2015

Some country-specific factors may play a role in recognition and management of depression in PC settings. Currently, two parallel and separate PC systems coexist in Lithuania. PC health centers employ family practitioners and are expected to cover the majority of medical problems whereas mental health problems are assigned to primary mental health centers where psychiatry teams are employed. Such a system may contribute to poor recognition and management of depression by family practitioners as they may assign mental health issues to primary mental health care services [30, 33].

Existing evidence suggests that depression remain poorly recognized and managed in the PC setting mainly because PC health providers face significant time constraints, and receive limited training with regard to identification and management of mental health issues.

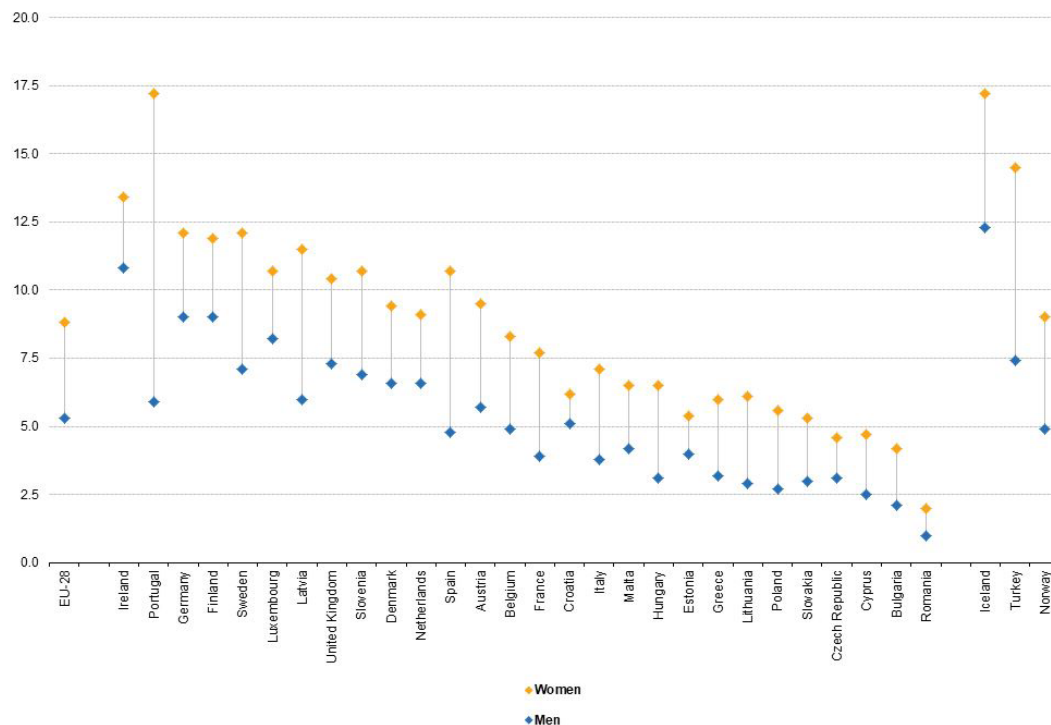
Advances in understanding suicidal thinking, strongly intertwined with mood states, as well as psychological and neurocognitive factors influencing a person's decision making [34, 35] are needed to advance the clinical care of suicidal patients and prevention of suicidal behaviour. It is an area where psychotherapy and neuroscience must meet.

### THE CHALLENGES AND THE SOLUTIONS

In 2013, the 66th World Health Assembly, composed of

the ministers of health of 194 member states, approved the WHO Mental Health Action Plan 2013–2020. Member states committed to strive for the common goal of decreasing the number of suicides by 10 percent by 2020 [14]. One of the goals of the Lithuanian Health Strategy 2014–2025 [36] is to decrease the SMR due to suicide down to 19.5 cases per 100,000 residents by 2020, and then to 12 cases by 2025. The rates had only been reduced by 1.6 percent from 2012 to 2015 [11]. A fraction of at-risk individuals remains unidentified and help-offering institutions often fail to react in a timely manner and to provide help throughout the country. The achievement of such an ambitious goal necessitates the mobilization and purposeful action on the part of all sectors (health, education, social security and labour, interior affairs, non-government organizations (NGO), etc.).

Important efforts have been made in recent years to improve mental health services, which have contributed to initiate a reduction in the number of deaths by suicide. Many strategies have been developed not only to prevent suicide but also to detect depression symptoms earlier and provide more appropriate treatment for other mental health issues. Psychological help for those who are not willing or not able to seek out professional assistance of a psychologist or a psychotherapist due to financial restrictions is available through online or phone suicide prevention hotlines, there are



Note: ranked on the share of the total population reporting that they had chronic depression.

Source: [15] State of Health in the EU. State of Health in the EU Lithuania Country Health Profile 2019. Available online: <https://ec.europa.eu/health/sites/health/files/state/docs/2019chplenglish.pdf>

Figure 5. State of the population reporting that they had chronic depression, 2014

nine phone numbers listed.

Reliability of suicide certification and reporting is an issue in great need of improvement. Suicides are most commonly found misclassified according to the codes of the 10th edition of the International Classification of Diseases and Related Health Conditions (ICD-10) [6]. In addition, stigma associated with suicide (and suicide attempts) has profound psychological and behavioral effects on individuals and families – who may avoid seeking help, and may conceal or deny suicide – and also affects false death registration and coding practice [37, 38]. Providing case registration information to policy makers, researchers and health professionals allows greater exposure to the problem of suicide and can be a way of raising awareness, initiating research and developing prevention campaigns, and monitoring the effectiveness of suicide prevention and intervention strategies.

## CONCLUSIONS

Although Lithuania's mortality rate by suicide has come down over the past decade, in 2018 it was still the highest reported in the EU, which poses a serious challenge to mental health services, highlighting the problems in the mental healthcare system. In order for things to change, the stigma surrounding mental illnesses ought to be annulled, the suicide prevention programs must be involved evidence-based interventions from population level to the individual, implemented simultaneously within a localized region. Integral to the success of this program is collaboration

between local healthcare, community services.

Lithuania aims to develop a prevention strategy affecting the entire population, in order to increase access to health care services and promote taking care of a mental health, to reduce the consumption of alcohol; early identification, treatment and care of people with mental and substance use disorders, chronic pain and acute emotional distress; training of non-specialized health workers in the assessment and management of suicidal behavior; follow-up care for people who attempted suicide and provision of community support. Advances in understanding suicidal thinking, strongly intertwined with mood states, as well as psychological and neurocognitive factors influencing a person's decision making are needed to advance the clinical care of suicidal patients and prevention of suicidal behaviour. Given that suicide is complex and multifaceted, a broad array of suicide prevention strategies addressing different risk factors at various levels is recommended to achieve an overall reduction in the population's long-term suicide rate. In the future, more research is needed to improve the prediction of suicide in depression, along with more effective implementation of preventative measures.

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# Narrative Review: Depression Assessment Scales Used in Lithuania

## Literatūros apžvalga: Lietuvoje naudojamų depresijos vertinimo skalės

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### SUMMARY

The measurement of health outcomes is critical defining subjective and objective patient's experiences, and evaluating treatment efficacy. For this purpose, a large number of depression rating scales have been published to screen, monitor and evaluate the severity of the disorder. However, it is still rather difficult for the clinicians and researchers to choose an appropriate rating scale without adequate information on their psychometric properties. This work aims to provide a selective overview of key depression symptoms assessment scales most often used in clinical practice and research as well as to examine the characteristics of questionnaires regarding their adaptation and validity in Lithuania.

**Keywords.** Depression, Depressive symptoms, Depression assessment scales.

### SANTRAUKA

Sveikatos simptomų vertinimas yra itin svarbus apibrėžiant subjektyvią ir objektyvią paciento patirtį ir gydymo efektyvumą. Šiuo tikslu yra publikuota nemažai depresijos įvertinimo skalių, skirtų sutrikimo sunkumui tirti, stebėti ir vertinti. Vis dėlto pastebima, kad kliniciams ir tyrėjams vis dar yra sunku pasirinkti tinkamą įvertinimo skalę, neturint pakankamai informacijos apie jų psichometrinės savybes. Šiuo darbu siekiama pateikti pagrindinių depresijos simptomų vertinimo skalių, dažniausiai naudojamų klinikinėje praktikoje ir tyrimuose Lietuvoje, apžvalgą, kartu pateikiant klausimynų charakteristikas atsižvelgiant į jų adaptaciją ir validizaciją Lietuvoje.

**Raktiniai žodžiai:** Depresija, depresijos simptomai, depresijos vertinimo skalės

### THE BURDEN CAUSED BY DEPRESSION

About 264 million people in the world are affected by depression, and the World Health Organization has stated it to be the leading cause of disability [1]. According to the data provided by the Health Information Centre of the Hygiene Institute of the Lithuanian Ministry of Health, in 2018 mood disorders were one of the leading psychiatric disorders in the country [2]. Depression can affect people of all ages. This mental disorder is a common cause of disability and reduced life-satisfaction in senior years [3]. In youth, depression is seen as prevalent and disabling condition which can increase chances of chronic, recurrent illness and impairment later in life [4, 5].

### THE IMPORTANCE OF ADEQUATE ASSESSMENT

Adequate evaluation and assessment of depression symptoms is important to not only screen for the right diagnosis, but also to evaluate unique symptoms profile of an individual case and treatment response. Due to far many currently offered questionnaires, mental health practitioners and researchers face a great difficulty in choosing the best scales to measure depression severity and treatment outcomes. In order to select the appropriate questionnaire for the clinical practice and research study, it is critically important to understand the psychometric characteristics and adaptation procedures as well as history of a particular questionnaire and for what purpose it was developed.

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Therefore, this paper aims to review depression assessment scales most often used in clinical practice and research and to examine the characteristics of the scales regarding their adaptation and validity in Lithuania.

## DEPRESSION RATING SCALES

The nine most commonly used scales for depressive symptoms in clinical practice and research in Lithuania were selectively chosen and reviewed. These scales are: *The Beck Depression Inventory-II* [6], *The Burns Depression Checklist* [7], *The Edinburgh Postnatal Depression Scale* [8], *The Geriatric Depression Scale* [9], *The Hamilton Depression Rating Scale* [10], *The Hospital Anxiety and Depression Scale* [11], *The Montgomery and Åsberg Depression Rating Scale* [12], *The Patient Health Questionnaire-9* [13] and *The Zung Self-Rating Depression Scale* [14]. Following the introductions to each scale, the characteristics of their adaptation and validity in Lithuania are presented as well (Table 1). The questionnaires were reviewed regarding psychometric properties, scale development and variability in scale functioning.

## THE BECK DEPRESSION INVENTORY-II

The Beck Depression Inventory-II (BDI-II) is a 21-item, self-report instrument used to measure motivational, emotional and behavioural symptoms of depression [6, 15]. The first version of the questionnaire (BDI) was developed in 1961 by Aaron T. Beck and colleagues [16]. It was designed to effectively discriminate between groups of patients with varying degrees of depression. It could also reflect changes in the intensity of depression after an interval of time, giving the clinician possibility to rate the effectiveness of psychotherapy. As the authors expressed – “...in view of these attributes of reliability and validity, this instrument is presented as a useful tool for research study of depression, and as a step in the direction of placing psychiatric diagnosis on a quantitative basis (p. 61)” [16].

Indeed, it was one of the first questionnaires which rated behavioural depression symptomatology quantitatively. Existing depression measures at the time either did not rate the intensity of behavioural aspects of the disorder such as The Minnesota Multiphasic Personality Inventory or were derived from studies of regular college students. To test the usefulness of the questionnaire, A. Beck attempted to include patients in psychiatric facilities.

While this instrument was employed for registering varying degrees of depression, it was not designed to distinguish between diagnostic categories. Along with other self-rated tests, its applicability largely depended on the cooperation of the patients as well as their ability to comprehend the questions [16].

Approximately 17 years later the questionnaire was revised and copyrighted [15]. The new form (BDI-IA) had adequate psychometric characteristics, however, critics of the questionnaire have pointed out that the scale lacks consistency with the Diagnostic and Statistical Manual III definition of depression [15].

This scale had a second revision in 1996 (BDI-II) [6]. It

included psychological and somatic displays of a two-week major depressive episode, measuring the frequency and intensity of depressive symptoms, in accordance with DSM-IV [6].

The English version of BDI-II has been shown to have good psychometric characteristics [15]. Each item in the BDI-II is scored between 0 and 3. The final score of 1–10 is considered normal mood, 11–16 is seen as mild mood disturbance, 17–20 is considered borderline clinical depression symptomatology, 21–30 indicates moderate depression symptomatology, 31–40 is considered as severe depression and over 40 – is extreme depression symptomatology. The highest total of the instrument is 63. It takes approximately 10 minutes to complete.

As with all self-assessment instruments, limitations for BDI-II include probability of unintentional exaggeration or minimization of depression symptoms [17] e.g. patients with concomitant physical illnesses can have their fatigue scores inflated, but this inflation rather reflects symptoms due to illness and not depression [18]. By definition major depressive episode (MDE) symptoms must last for more than two weeks and the BDI-II specifically asks to assess individual changes in symptoms in the last two weeks [19]. Patients who experience their symptoms change in a shorter than two weeks period may be inclined to report no changes in depressive symptoms. Therefore, if the questionnaire is given to the patient weekly, clinician or researcher should advise patient to concentrate on experiences within the time period of interest.

The psychometric properties of the Lithuanian BDI-II questionnaire have been verified showing adequate internal consistency, validity and proposed good factor structure in samples of patients with coronary artery disease [20] and brain tumours [21]. However normative cut-offs for depression severity evaluation still need to be verified for Lithuanian populations.

## THE BURNS DEPRESSION CHECKLIST

The Burns Depression Checklist (BDC) [22] is a self-reported instrument developed by David D. Burns in 1984 to measure and track patients progress between therapy sessions. The original version of BDC consisted of 15 questions but the upgraded version in 1996 has 25 items [23].

The 25-item BDC rates the intensity of patient's depression symptoms in these areas: thoughts and feelings, activities and personal relationships, physical symptoms, and suicidal urges. Participants are asked to indicate how much they experienced each symptom during the last week by rating on a scale from 0 to 4, with a higher score representing a more severe symptomatology. The final score of 0–5 indicates no depression symptoms, 6–10 is considered as regular mood, but with some unhappiness, 11–25 indicates mild depression symptoms, 26–50 shows moderate depression symptoms, 51–75 is considered as severe depression symptoms, and 76–100 indicates extreme depression symptoms.

The Psychometric properties of BDC have been investigated and showed good internal consistency, strong content validity, excellent concurrent validity, and well-established discriminant validity [24]. It was also assessed in

Table 1. Prevalence of sleep complaints and sleep parameters among males and females in 2003 and 2013

Depression Scale	Adaptation in Lithuania	Validated groups in Lithuania	Licensed
The Beck Depression Inventory-II (BDI-II) [6]	Partial adaptation in specific samples	Patients with coronary artery disease [20]. Patients with brain tumours [21]	Copyrighted by Pearson, Ltd. ( <a href="https://www.pearsonassessments.com/">https://www.pearsonassessments.com/</a> )
The Burns Depression Checklist (BDC) [7]	No	—	Burns DD. Geros nuotakos vadovas, nauja emociju terapija. Vilnius: Psichologija TAU; 2013
The Edinburgh Postnatal Depression Scale (EPDS) [8]	Yes	Women two weeks postpartum [8]	Users may reproduce the scale without permission providing the copyright is respected by quoting the names of the authors, title and the source of the paper in all reproduced copies.
The Geriatric Depression Scale (GDS) [9]	No	—	Freely available at <a href="http://biological-psychiatry.eu/wp-content/uploads/2014/06/1999_1_1_Instrumentuot%C4%97.pdf">http://biological-psychiatry.eu/wp-content/uploads/2014/06/1999_1_1_Instrumentuot%C4%97.pdf</a>
The Hamilton Depression Rating Scale (HAM-D) [10]	No	—	Reproduced with permission of John Wiley & Sons Ltd. For more information please visit <a href="https://eprovide.mapi-trust.org/instruments/hamilton-depression-rating-scale">https://eprovide.mapi-trust.org/instruments/hamilton-depression-rating-scale</a>
The Hospital Anxiety and Depression Scale (HADS) [11]	Yes	Students [47] Primary care patients [40] Patients with coronary artery disease [20] Patients with brain tumours [21]	Lithuanian HADS version is not available anymore due to changes in licensing terms. All questions regarding permission to use the Lithuanian scale version should be addressed to The GL Assessment Education Group (info@gl-assessment.co.uk). For more information please visit: <a href="https://eprovide.mapi-trust.org/instruments/hospital-anxiety-and-depression-scale">https://eprovide.mapi-trust.org/instruments/hospital-anxiety-and-depression-scale</a>
The Montgomery and Åsberg Depression Rating Scale (MADRS) [12]	Partial adaptation in specific samples	Patients with coronary artery disease [42]	The copyright on the MADRS is claimed by Stuart Montgomery and the Royal College of Psychiatrists.
The Patient Health Questionnaire- 9 [13]	Partial adaptation of a short form of a questionnaire PHQ-2	Patients with brain tumours [45]	Freely available at <a href="http://biological-psychiatry.eu/wp-content/uploads/2019/01/JBPP_2018_v20_No2_57-59.pdf">http://biological-psychiatry.eu/wp-content/uploads/2019/01/JBPP_2018_v20_No2_57-59.pdf</a>
The Zung Self-Rating Depression Scale (SDS) [14]	No	—	Copyrighted by W. Zung, 1972, for more information please visit <a href="https://eprovide.mapi-trust.org/instruments/the-zung-self-rating-depression-scale">https://eprovide.mapi-trust.org/instruments/the-zung-self-rating-depression-scale</a>

the dissertation thesis of Jessica Ann Damron [25] showing adequate psychometric properties for the BDC-Revised. However, in comparison to other depression scales, BDC is rarely used in research and more often applied in clinical practice. The Lithuanian version is available in a David D. Burns book published in 2013 [7]. However, this questionnaire has not been adapted to Lithuanian populations and clinicians as well as researchers should not use its results as the basis for their scientific findings, neither to monitor patients' mood or therapy effectiveness relying on the severity scores provided.

### THE EDINBURGH POSTNATAL DEPRESSION SCALE

The Edinburgh Postnatal Depression Scale (EPDS) [26] is a self-reported 10-item tool developed to assist health professionals in detecting emotional distress of mothers during

pregnancy and the postnatal period. It takes about 5 minutes to complete. During the assessment, an individual has to pick an answer reflecting mood over the past week. Answers are scored on a scale from 0 to 3 with a higher number representing increased severity of depression symptoms. Some items are marked with an asterisk (\*) and are scored in reverse, from 3 to 0.

The items included in this scale correlate to MDE symptoms within psychiatric and psychotherapeutic practices assessing feelings of guilt, sleep disturbance, low energy, anhedonia, and suicidal thoughts. (26). However, in a study conducted by Brouwers and colleagues investigating the factor structure of the questionnaire it was found that EPDS has two-factor structure and does not just measure depression, but also an anxiety [27].

The final score of 0–9 indicates some symptoms of

distress that may be short-lived and are less likely to interfere with everyday ability to function at home or work; 10–12 is considered as presence of symptoms of depression that may cause discomfort (it is recommended to repeat the assessment in 2 weeks and monitor progress); a score of 13 and above – requires further assessment of possible depression symptoms (referral to a psychiatrist/psychologist might be necessary). If the last item about suicidal thoughts is scored from 1 to 3, further evaluation is recommended to ensure the mother's and the child's safety.

Ever since the development of the EPDS a number of studies have shown that the questionnaire has good psychometric properties for measuring postpartum depression [28]. However, there is a significant variability in validation studies of psychometric properties and optimal cut off scores, thus it is highly recommended to validate EPDS for a particular population [28].

The Lithuanian version of EPDS has been adapted showing that the scale is a reliable instrument for repeated evaluations of depressive symptoms during pregnancy [8]. It has good psychometric characteristics for detecting antenatal major depressive disorder with an optimal cut-off of 11/12 or higher [29].

### THE GERIATRIC DEPRESSION SCALE

The Geriatric Depression Scale (GDS) was first created by Yesavage et al. (1983) and is designed for older adults from age 66. The scale was design to avoid interference of depression symptoms with medical illness and it was made easy to understood for mild to moderately cognitively impaired respondents [30]. It is a useful screening tool to measure depression in older adults in clinical settings when baseline measurements are compared to subsequent scores. The GDS has a long form (30-items) and a short form (15-items) questionnaires in which participants are asked to respond by answering "yes" or "no" in reference to how they felt during the past week. It is a screening tool used in the clinical setting to facilitate assessment of depression in older adults when baseline measurements are compared to subsequent scores. This tool can be used in retirement homes, hospitals or primary care clinics. It does not require high medical qualification; it can be used by medical and nursing staff. The assessment can be done in person or over the phone [9]. A limitation of GDS is that it does not assess suicidality, which is something to keep in mind for the interviewer during the assessment. In the short form of GDS scores of 0–4 are considered as regular mood; 5–8 indicates mild depression symptomatology; 9–11 refers to moderate depression symptomatology; and 12–15 indicates severe depression symptomatology. In the long form: 0–9 indicates regular mood; 10–19 mild depression symptomatology; 20–30 represents severe depression symptomatology [9, 31]. In practise, the short form of GDS is used more commonly. This form is easier for patients who are physically ill or have mild to moderate dementia, for those who have short attention spans and/or feel easily fatigued. It takes about 5 to 7 minutes to complete [31].

The English version of both short and long forms of GDS were found to have very good psychometric properties and

both were successful in differentiating depressed from non-depressed adults [32]. Freely accessible in Lithuania [9], this scale requires further validation and adaptation to be used in Lithuanian geriatric population.

### THE HAMILTON DEPRESSION RATING SCALE

The Hamilton Depression Rating Scale (HAM-D) is a clinician-administered depression assessment scale used for clinical and research assessments. Developed in 1960 by M. Hamilton, it is used to measure the severity and the treatment course of depression [10].

The original version of HAM-D consists of 21 items, but over the years several versions have been developed resulting in 29 items. In the original form a severity score yields from 0 to 63 and has proven to be a reliable and valid measure of depression across various populations [33, 34]. The items in the scale measure patients depressed mood, work and interests, vitality, anxiety, guilt feelings, psychomotor changes (motor, verbal, intellectual, and emotional), psychomotor agitation and suicidal thoughts [10]. Usually a sum of the first 17 statements is used to determine the severity of depression symptomatology. The first 8 items are scored on a five-point scale, ranging from zero to four and nine others are scored from zero to two. Additional items from 18 to 21 provide information about symptoms associated with depression, such as circadian rhythms, paranoid symptoms, obsessions and compulsions. The final scores ranging from 0 to 7 is accepted to be within the normal mood range (or in clinical remission), from 8 to 19 is considered as mild depression symptomatology, 20 or higher indicates moderate severity depression symptomatology [35].

A limitation of the HAM-D is that atypical symptoms of depression such as hypersomnia, hyperphagia are not assessed [34]. This is a clinician rating scale based on patient interview and being a multiple question scale, it requires approximately 15 to 20 minutes to be completed. On the other hand, good psychometric characteristics of the English version questionnaire ensured that this scale remains a gold standard for depression symptomatology assessment in clinical pharmaceutical trials [36]. It is frequently used scale for measuring the effectiveness of antidepressant [37]. However, to the best of our knowledge, this scale is not adapted to the Lithuanian population.

### THE HOSPITAL ANXIETY AND DEPRESSION SCALE

The Hospital Anxiety and Depression Scale (HADS) was developed by A.S. Zigmond and R.P. Snaith in 1983 to measure symptoms of anxiety and depression [11]. This instrument was found to perform well when assessing anxiety and depression in somatic and psychiatric cases, in primary care patients and in the general population [38]. It is also validated to use with adolescents [39].

This instrument consists of two subscales, anxiety (HADS-A) and depression (HADS-D), both containing seven intermingled items. It is used to indicate how the respondent has felt in the past week. It takes 2–5 min. to complete. Each question is scored from 0 to 3 and the final scores for

anxiety and depression are counted separately. Final scores between 0 and 7 are considered regular mood, 8–10 are seen as borderline depression symptomatology and 11–21 indicate severe depression symptomatology.

In a sample of 503 primary care patients, it has been found that the Lithuanian version of HADS-D at a cut-off score of  $\geq 6$  showed adequate performance in screening for a major depressive episode (MDE), but not dysthymia [40]. Similarly, in patients with coronary artery disease optimal cut-off values for screening of major depressive disorder were  $\geq 5$  for the HADS-D [20]. However, at optimal cut-off values the BDI-II  $\geq 14$  had slightly superior psychometric properties when compared to the HADS [20]. Another problem with HADS, which is that it is currently copyrighted, and assessment charges are applied both per individual assessment and per research study. Historically, the questionnaire was freely available. Due to its simplicity, low administration costs and ease of use the HADS became one of the most popular depression screening tools in research studies and clinical practice. However currently use of the questionnaire is licensed by GL Assessment, and a license agreement must be completed beforehand, and a user fee is required to all users (commercial, healthcare organizations and academic users). Although HADS can still be found in many older textbooks and can be easily downloaded from the internet, users should be mindful that unlicensed use of the scale will infringe copyright.

### THE MONTGOMERY-ÅSBERG DEPRESSION RATING SCALE

The Montgomery-Åsberg Depression Rating Scale (MADRS) is a clinician administered questionnaire used to measure the severity of depressive episodes in patients with mood disorders [12, 41]. Developed in 1979 by S. A. Montgomery and M. Åsberg, it was meant as an addition to the HAM-D, which would be more sensitive to changes brought on by antidepressants and other forms of treatment [12].

The questionnaire was developed using a Comprehensive Psychopathological Rating Scale (CPRS). The CPRS is composed of 65 scaled items covering a wide range of psychiatric symptoms. MADRS authors took 10-items of CPRS to form a questionnaire covering particularly prevalent symptoms of individuals with depression. Each item in the scale has a score ranging from 0 to 6 and the overall sum score ranges from 0 to 60. The questionnaire includes items such as sadness, inner tension, reduced sleep, reduced appetite, concentration difficulties, lassitude, inability to feel, pessimistic and suicidal thoughts. The final score from 0 to 6 is considered as regular mood, 7 to 19 – mild depression symptomatology, 20 to 34 – moderate depression symptomatology and  $>34$  – severe depression symptomatology [12]. This instrument can be used by nursing staff, psychologists and psychiatrists [41].

In comparison to HAM-D, MADRS is shorter and requires approximately 8 to 12 minutes to be completed. Differently from HAM-D this scale does not measure patient's psychomotor agitation. However, like HAM-D, MADRS does not have reverse vegetative symptoms (i.e., increased appetite and hypersomnia). This limits scale's sensitivity assessing

patients with atypical depression. The English version of the questionnaire has been shown to have good psychometric characteristics and is useful for major depressive disorder screening [19].

The Lithuanian version of MADRS has been adapted in a sample of 522 patients with coronary artery disease showing that MADRS had one-factor structure and high internal consistency [42]. At a cut-off value of 10 or higher the Lithuanian version of the questionnaire had good psychometric properties for the identification of current MDE [42].

### THE PATIENT HEALTH QUESTIONNAIRE-9

The Patient Health Questionnaire-9 (PHQ-9) [13, 43] is a self-administered 9-item depression module from the full Patient Health Questionnaire that measures how the patient felt in the past two weeks before the questionnaire was administered. It is a multipurpose instrument for screening, monitoring and measuring the severity of depression. This instrument incorporates DSM-IV depression diagnostic criteria with other depressive symptoms.

Each of the items in the questionnaire can be measured from 0 (not at all) to 3 (nearly every day) and the final score can range from 0 to 27. There is one additional non-scored item at the end of the diagnostic section, which assigns weight to the degree to which depressive problems have affected the patient's level of functioning. The PHQ-9 scores of 0–4 are considered minimal depression symptomatology, 5–9 indicates mild depression symptomatology; 10–14 indicates moderate depression symptomatology; 15–19 indicates moderate to severe depression symptomatology and 20–27 is considered as severe depression symptomatology [13]. Clinicians and psychologists can administer this tool. It is used with somatic, psychiatric and primary care patients.

A limitation of PHQ-9 is that it does not measure depression symptoms that are not included in the DSM-IV criteria, e.g., loneliness, hopelessness, and anxiety, which may provide additional information to the clinician when accessing a patient [13].

The English version of PHQ-9 demonstrated adequate reliability, convergent/discriminant validity, and similar responsiveness to change in a sample of 172 depressed patients in two randomized clinical trials [44]. The study authors noted that 'the attributes of the PHQ-9, being shorter and based on the diagnostic criteria for depression, may indicate an advantage over the BDI-II [44]. While the Lithuanian version of PHQ-9 is freely available, there is still a need for adaptation of this instrument to be used in clinical practice and research. However, a shortened version of PHQ-9 consisting of only two questions, PHQ-2, was validated by Bunevicius et al. [45] in neurosurgical patients with brain tumours.

### THE ZUNG SELF-RATING DEPRESSION SCALE

The Zung Self-Rating Depression Scale (SDS) [14] is a self-administered questionnaire, created by W.K. Zung in 1965 to assess the severity of depression for patients diagnosed with depressive disorder [38]. It is a 20-item tool used to rate characteristics of depression: the pervasive effect, the physiological equivalents, other disturbances, and



psychomotor activities. SDS results provide indicative ranges for depression severity that can be useful for clinical and research purposes.

As a screening tool, SDS is often used for monitoring changes in depression severity. The questionnaire takes about 10 minutes to complete with ten positively and ten negatively worded questions. Each question is scored on a Likert scale of 1–4 (a little of the time; some of the time; a good part of the time; most of the time). A final score ranging from 20 to 44 represents regular mood, 45–59 indicates mild depression symptomatology, 60–69 is considered as moderate depression symptomatology, 70 and above represents severe depression symptomatology.

The SDS scale has recently undergone new validation of its psychometric properties showing that the instrument could

be used for identification of individuals with major depressive disorder [46]. However, the psychometric properties of SDS in the Lithuanian populations have not been researched.

## CONCLUSION

There are variety of assessment scales used in Lithuania for screening, monitoring and measuring the severity of depression. Most of them are based on self-report and filled in by the patient or client themselves. All of the reviewed instruments have been translated into Lithuanian, however only a couple of the depression rating scales currently used are culturally adapted. A few have been partially validated in Lithuania. There is a need for adapting and validating all depression scales to ensure accurate patient assessment and treatment.

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# Depression Management in Primary Care in Lithuania and Latvia

## Depresijos diagnostika ir gydymas Lietuvos ir Latvijos pirminėje sveikatos priežiūroje

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### SUMMARY

**Background.** Lithuania (LT) and Latvia (LV) have high prevalence of depressive disorder with one of the highest prevalence of suicide in Europe. A critical first step in the provision of treatments for any disorder is its effective recognition. General practitioners (GPs) are usually the first contact of the health care system that are obligated to recognize depression at an early stage in order to manage it within an interdisciplinary team successfully. Primary care providers play a central role in managing depression and concurrent physical comorbidities, and they face challenges in diagnosing and treating the condition. Good mental health care outcomes provided by GPs' are related with GPs' skills in diagnosing and treating depressive disorders. Effective mental health protocols and guidelines are the basis to assure successful depression management in primary care (PC).

**The Aim.** to review current Lithuanian and Latvian mental health strategies, protocols, guidelines also to evaluate recent literature data on GPs' duties, involvement, self-confidence, skills in recognizing and managing depression in their daily practices.

**Materials and methods:** literature search and review were conducted by using Lithuanian and Latvian mental health care protocols for PC, guidelines, local and WHO statistical bases and studies on depression recognition, diagnosing, treatment and prevention in PC in both, LT and LV from PubMed and Medline databases.

**Results.** Lithuanian and Latvian Health Care systems do not provide guidelines addressed for GPs on how to recognize, diagnose and follow-up patients with depression in PC. GPs have only general recommendations. Only treatment recommendations are indicated in both countries, however, steps differ as well as reimbursement levels. Our review suggests that GPs have doubts about their clinical skills and preparedness to recognize and treat depression in both, LT and LV.

**Discussion.** clinical practice guidelines and recommendations are needed for GPs in order to assure effective recognition, diagnosing and treatment of depression in PC. Further training is needed to improve GPs' skills in mental health management in LT and LV.

**Key words:** general practitioner; primary care; depression; mental health; Lithuania; Latvia

### SANTRAUKA

**Įvadas.** Lietuvoje (LT) ir Latvijoje (LV) depresijos ir susijusių sutrikimų paplitimas yra aukštas, o pagal savižudybių skaičių šios šalys pirmąją Europoje. Sveikatos priežiūros sistemoje šeimos medicinos gydytojai dažniausiai yra pirmieji su kuriais kontaktuoja pacientai, tai suteikia galimybę atpažinti depresiją ankstyvoje stadijoje ir ją sėkmingai kontroliuoti bendradarbiaujant su tarpdisciplinine komanda. Pirminės sveikatos priežiūros paslaugų teikėjai vaidina pagrindinį vaidmenį gydant depresiją ir gretutines somatines ligas, todėl jie susiduria su iššūkiais diagnozuojant ir gydant tokias būkles. Veiksmingi psichikos sveikatos priežiūros strategijos žingsniai ir gairės itin svarbūs, užtikrinant sėkmingą depresinių sutrikimų kontroliavimą pirminės sveikatos priežiūros grandyje.

**Tikslas.** apžvelgti LV ir LT esančias psichikos sveikatos priežiūros strategijas, gaires, strateginius žingsnius bei naujausius literatūros duomenis apie šeimos gydytojų pareigas, dalyvavimą, pasitikėjimą savimi ir įgūdžius atpažįstant ir gydant depresiją kasdieninėje praktikoje.

**Metodai.** literatūros paieška bei apžvalga buvo atlikta naudojantis LT ir LV psichikos sveikatos priežiūros reglamentais, gairėmis, statistinėmis duomenų bazėmis, PSO statistiniais duomenimis, PubMed ir Medline duomenų bazėse esančiais tyrimais apie depresijos atpažinimą, diagnozavimą, gydymą ir prevenciją pirminėje sveikatos priežiūros grandyje Lietuvoje ir Latvijoje.

**Rezultatai.** LT ir LV sveikatos priežiūros sistemos neturi parengusios depresijos atpažinimo, diagnozavimo, ligos sekimo priežiūros gairių skirtų šeimos gydytojams. Šeimos gydytojams pateiktos tik bendro pobūdžio rekomendacijos. Abiejose šalyse pateiktos panašios depresijos gydymo rekomendacijos, tačiau skiriasi ligos gydymo etapų bei vaistų kompensacijos tvarka. Mūsų apžvalga rodo, kad LT ir LV šeimos gydytojai abejoja savo klinikiniais įgūdžiais ir pasirėmimu atpažinti bei gydyti depresinius sutrikimus.

**Diskusija.** šeimos gydytojams yra reikalingos gairės ir rekomendacijos tinkamam depresijos atpažinimui, diagnostikai ir gydymui klinikinėje praktikoje. LT ir LV reikalingi papildomi šeimos gydytojų mokymai, skirti klinikinių įgūdžių lavinimui psichikos sveikatos priežiūros srityje.

**Raktiniai žodžiai:** šeimos medicinos gydytojas; pirminė sveikatos priežiūra; depresija; psichinė sveikata; Lietuva; Latvija

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## INTRODUCTION

The importance of depression as an international and major public health problem, and the importance of primary care-based support for the majority of people with depression are now well recognized [1–4]. One decade ago, the World Health Organization (WHO) reported that depression was the leading cause of disability and the fourth leading contributor to the global burden of disease [5]. Recently, the WHO stated that depression is still a leading cause of disability worldwide, and a major contributor to the overall global burden of disease [6]. These numbers are still increasing despite the Prevention and management of depression in PC in Europe as a holistic model of care and interventions – position paper of the European Forum for Primary Care was introduced 10 years ago [5,7]. Depression is expected to become one of the three leading causes of burden of disease by 2030 [8]. Globally, depressive disorders are ranked as the single largest contributor to non-fatal health loss (7,5 %. Of all years of life disabled, YLD) [6]. Care of patients with chronic diseases like depression is frequently not proactive in PC including with other mental health problems, which must be solved in a very complex manner by GPs' [9]. It is estimated that 10–14% of patients seen in PC clinics at any given time have major depression. Unfortunately, reports also suggest that half of these PC patients will not be recognized as having depression [10]. According to the Ministry of Health of the Republic of Lithuania, one of the main priorities in the public health sector is improvement of mental health [11] as well as by the Ministry of Health of the Republic of Latvia [12]. In order to ensure psychosocial wellbeing of people and more versatile assistance to persons with problems of mental health, the Strategy on Mental Health of Lithuania has been developed [11]. Despite these efforts, leading countries of mood, anxiety disorders and suicidal ideation still remain Baltic states within Europe [13] with poor recognition and management of mental disorders by GPs' in Lithuania [14,15] and Latvia [16,17], and with both states having highest rates of suicide in the world [13]. Consequently, this review seeks to review Lithuanian and Latvian mental health strategies, protocols, guidelines and recent literature on GPs' duties, involvement, self-confidence and skills in recognizing and managing depression in their daily practices.

# MENTAL HEALTH PROBLEMS AND DEPRESSION STATISTICS IN LATVIA, LITHUANIA AND OTHER EUROPE COUNTRIES

More than 300 million people over the world were estimated to suffer from depression, equivalent to 4.4% of the world's population in 2017. According to the WHO statistical data in the Europe region there are 40.27 million cases (12%) of depressive disorders (Table 1). Data show higher prevalence in the female population [18]. The burden of depression by the WHO is provided in Table 2 [19].

Studies on mental health problems and depression tendencies, recognition, management in Latvia and Lithuania in PC are scarce. There are only few recent decade studies on depression performed. We found 3 studies from LT [20–22] and 4 studies from LV [17, 23–25] available at PubMed, Medline

Table 1. Prevalence of depressive disorders in Europe [18]

Country	Prevalence of depressive disorders	
	Total cases	% of population
Lithuania	169 685	5.6
Latvia	102 702	4.9
Estonia	75 667	5.9
Poland	1 878 988	5.1
Czech Republic	525 488	5.2
Finland	293 921	5.6
Sweden	446 734	4.9
Norway	227 446	4.7
Denmark	267 213	5.0

databases, dated 2010–2020. According to the Latvian Centre for Disease Prevention and Control (CDPC) the number of patients with mental and behavioral disorders in the Latvian Registry is increasing [26,27]. According to the 2016 Survey of Habits Affecting the Health of the Population of Latvia, 48.4% of the population aged 15–64 have experienced tension, stress and depression in the last month. 6.2% of the population noted that tension, stress and depression are common (5.2% of men and 7.2% of women). 6.6% of the respondents complained of depression in the last month, while 16.3% of them have complained of insomnia [26]. Creating a psycho-friendly, supportive and understanding-based environment in the family, at school, in relationships with friends, in relationships with peers, in society, is reported by Latvian authorities as crucial to promoting psycho-emotional well-being [26].

With regard to the mental health of children and adolescents, school bullying is a common form of violence that has a markedly negative impact on the psyche, related to depressive disorders. The prevalence of bullying in Latvia is high, not only because of the high proportion of 13.6% of pupils who are victims in the 11, 13 and 15 age groups, but also among the 42 countries and regions participating in the International Student Health Behavior Survey. Latvia is ranked in the second place in terms of the number of victims of bullying among pupils aged 11, 13 and 15 [26]. Also one of the main mental health problems adolescents face in Lithuania is school bullying: more than half of all schoolchildren are involved in bullying [28–31].

Depression is often lead by suicide [32–37]. Suicide prevention was the objective of new policy and legislative measures in several countries. This allowed for the creation of a suicide prevention bureau at the State Mental Health Center in LT [2]. One of the important indicators of mental health situation and depressive disorders is suicide in LV also. Comparing the dynamics of suicide rates in Latvia and Lithuania, they are variable, but overall, from 2013 to 2016, there is a slight decrease from 19 per 100,000 in 2013 to 18.2 per 100,000 in 2017 in Latvia [26]. In Lithuania suicide rates have been decreasing also since 2013 and in 2018 suicide rates reached 28 suicides per population of 100,000 which would be 683 in absolute numbers. Unfortunately Lithuania still exceeds the EU average. In fact, statistics show that Lithuania

Table 2. The burden of depression in Europe by the WHO: facts and figures [19]

- Each year, 25% of the population suffer from depression or anxiety.
- Neuropsychiatric disorders account for 19.5% of the burden of disease in the European Region, and 26% in European Union (EU) countries.
- These disorders account for up to 40% of years lived with disability, with depression as the main cause.
- Up to 50% of chronic sick leaves are due to depression/anxiety.
- About 50% of major depressions are untreated.
- The cost of mood disorders and anxiety in the EU is about €170 billion per year.

is topmost country by suicide rate in 2020 (31.9 suicides per 100,000) [38–41]. Moreover, the middle age men population is in the highest risk group [40]. Taken all above into account, GPs should be first to take early interventions to diagnose not only depression but also detect suicide ideations [42].

### MENTAL HEALTH STRATEGY IN LITHUANIA AND LATVIA

In 2007, the Lithuanian Government approved a Strategy on Mental Health. According to this strategy, the GP's institution is the key to the successful implementation of mental health policy by integrating public and personal health care efforts to protect and enhance citizens' mental health in Lithuania [43]. One of the goals of this strategy is for general practitioners and community nurses to be consulted by mental health professionals and to be able to provide assistance to the majority of the people seeking help due to mental health problems and disorders. Another goal is to train general practitioners to better recognize mental health problems, especially in recognition, to have better knowledge and motivation to diagnose and treat mental disorders [43] especially in those with comorbidities. It was found that training general practitioners in cognitive-behavioral methods also resulted in a demonstrable reduction of symptoms of depression among people with long-term conditions [44,45]. However, there is a lack of measures by which these steps and tasks would be implemented in the strategy. In 2016, the Government of the Republic of Lithuania presented the report of the Implementation of Strategy on Mental Health 2007–2016, and, according to this report, no changes have occurred in the GP's institution in the mental health area [46].

The most important aspects of mental health improvement in Latvia are focused on prevention of mental illness and suicide, improvement of mental health and well-being, improvement of somatic health, full realization of human resources and potentials, reduction of prejudices and discrimination, availability of specialists, interdisciplinary cooperation [47]. Recently the Ministry of Health of LV has prepared a medium-term policy planning document in LV – Plan “Improvement of Mental Health Care Accession Plan 2019-2020”. The plan has been developed in cooperation with the involved state administration institutions – Latvian Centre for Disease Prevention and Control, National Health Service (NHS), Health Inspectorate (HI) and psychiatric professionals [47].

According to the Latvian National Development Plan 2014–2020, Latvia's sustainable development is based on a

healthy and able-bodied person whose physical, mental and social well-being is one of the essential elements of healthy life. The Public Health Guidelines for 2014-2020, identified a number of issues and challenges related to mental health, including [47]:

- There is a bias in society towards people with mental health problems that hinders their inclusion.
- Suicide mortality rates remain high, especially among men.
- The number of people experiencing stress, tension and depression is rising.
- People with mental health problems do not seek primary health care in a timely manner, resulting
- In the primary diagnosis of mental health problems, which may be delayed [47].

Despite all above listed strategies which are made as general recommendations for mental health care, also challenges, there are no particular steps and tactics, based on evidence – based guidelines and recommendations for GPs to proceed in their daily practices in LV and LT.

### THE ROLE OF GP's IN MENTAL HEALTH PROBLEMS MANAGEMENT IN LITHUANIA AND LATVIA

#### General practitioner competencies on depression management

Primary mental health services are ensured by the GP's institution: GPs, community nurses and by mental healthcare teams – psychiatrist, psychologists and social workers in Lithuania [48]. Lithuanian General practitioner standards define GP's competence to treat depressive disorders, they are obligated to diagnose and treat mild to moderate depressive disorders in adults [49]. Latvia's general practitioners have addressed more detailed competences in recognition, diagnosing and treating depressive disorders than Lithuanians GPs, namely: management of mild/moderate depressive episode; recurrent depressive disorder – mild to moderate depressive episode; adaptation disorders with depressive response, assessing suicide risk; mild organic (symptomatic) depressive disorders. Also, GPs are addressed to recognize and assess the severity of the mood disorder – depressive episode, recurrent depressive disorder, bipolar affective disorder, comorbid depression with depression, depressive addiction in LV [50].

#### Depression management by GPs'

Currently, GPs' duties are to treat mild and moderate



depression cases in adult PC patients in Lithuania [49]. GPs prescribe 100% Lithuanian Government reimbursable antidepressants such as serotonin and noradrenaline reuptake inhibitors and selective serotonin reuptake inhibitors (SSRI) only for the moderate depression treatment. If a satisfactory treatment effect is not achieved within 4–8 weeks, the GP may prescribe monotherapy with another SSRI or direct patient to a psychiatrist or pediatric psychiatrist for a consultation [51]. If no clinical improvement is achieved treating mild/moderate depressive episodes within 4 to 8 weeks after administration of the antidepressant, Latvia's GPs have slightly different tactics – they have to send their patients for a psychiatrist consultation [50]. In Lithuania, GPs are very restricted in their ability to prescribe antidepressants, the indications for treatment and prescribing of 100% reimbursable antidepressants are very strict also. There are no medications that GPs can prescribe for a long time without consultation of a psychiatrist: certain antidepressants can be prescribed by GPs, and given for 6 months, when patients have to be consulted by a psychiatrist afterwards. Other antidepressants can be prescribed for 6 months only after patient consultation by a psychiatrist [52]. Details are given in Table 3.

Despite treatment tactics above, there are no evidence-based guidelines and management tools for GPs to follow-up patients with depression in PC in Lithuania.

Similarly, exclusive evidence-based guidelines on primary care population depression recognition, treatment and follow-up are not developed in Latvia for GPs to use, too, despite that the Latvian Association of Psychiatrists in cooperation with Latvian Family Physicians Association has developed clinical

guidelines for the diagnosis and treatment of schizophrenia, depression, and bipolar affective disorder, as well as clinical guidelines for the diagnosis and treatment of behavioral deficits and hyperactivity in the pediatric psychiatry population [50].

There have been several recent changes in reimbursement of depressive disorders treatment in Latvia. Diagnosis with ICD-10 codes of depression F32.1–F32.3 were started to be reimbursed 75% from 29th, April 2019, for those diagnosed by GPs in Latvia. Details are given in Table 4. Reimbursement of ICD-10 diagnosis F33.0–F33.4, F33.8, F33.9, has also been changed from 50% to 75% [53].

Compared to Lithuanian depression treatment schemes for GPs, Latvian treatment schemes slightly differ, despite reimbursement differences discussed above (Table 4).

## The challenges of depression management by GPs

Data from the Latvian National Health Service show that in 2016, only 5,132 unique patients with a diagnosis of mood disorders were diagnosed in primary care [23]. In both Latvia and Lithuania there is a significant lack of research on this topic which contributes to the lack of statistics from PC: how often GPs diagnose and what tools they use for diagnosing depression in PC, how often they treat depression and prescribe antidepressants. Only 7 articles were found in PubMed and Medline databases [17, 20–25]. There are some studies on recognition, in which were used the Patient Health Questionnaire-9 (PHQ-9) and its shortened version, the Patient Health Questionnaire-2 (PHQ-2) for diagnosing depression in PC in Latvia [23–25]. According to these studies the PHQ-9 is a reliable and valid instrument to diagnose major depression

**Table 3. Antidepressants which are prescribed by GP with 100% reimbursement in LT, based on ICD-10 diagnoses [52]**

Antidepressants	Indications ICD-10 diagnose
Prescribed for a period of 6 months by GPs, afterwards the consultation of psychiatrist is mandatory	
Amitriptylinum	F32.1, F33.1
Citalopramum	F32.1, F33.1
Duloxetine	F32.1, F33.1
Fluoxetine	F32.1, F33.1
Mirtazapinum	F32.1, F33.1
Paroxetine	F32.1, F33.1
Sertraline	F32.1, F33.1
Venlafaxine	F32.1, F33.1
Firstly, it is prescribed by a psychiatrist, later prescribed for a period of 6 months by GPs, following repetitive mandatory consultation by psychiatrists afterwards	
Bupropionum	F32.1, F33.1, F31.3 (only in patients with moderate depression)
Escitalopramum	F32.1, F33.1, F31.3 (only in patients with moderate depression)
Fluvoxamine	F32.1, F33.1, F31.3 (only in patients with moderate depression)
Tianeptine	F32.1, F33.1, F31.3 (only in patients with moderate depression)
Agomelatine	F32.1, F33.1
Firstly, it is prescribed by a psychiatrist, followed for a period of 3 months by GPs, after that the consultation of a psychiatrist is mandatory	
Acidum valproicum (Natrium valproatum)	F31.3
Haloperidolum	F32.1, F33.1, F31.3 (only in patients with moderate depression)
Lithii carbonas	F32.1, F33.1, F31.3 (only in patients with moderate depression)

**Table 4. Antidepressants which are prescribed by GP with 75% reimbursement in LV, based on ICD-10 diagnoses [53]**

Antidepressants	Indications ICD-10 diagnose
First line treatment. Prescribed for a period of 6 months by GPs, afterwards the consultation of psychiatrist is mandatory	
Amitriptylinum	F32.1–F33.4; F33.8, F33.9
Nortriptylinum	F32.1–F33.4; F33.8, F33.9
Fluoxetinum	F32.1–F33.4; F33.8, F33.9
Citalopramum	F32.1–F33.4; F33.8, F33.9
Paroxetinum	F32.1–F33.4; F33.8, F33.9
Escitalopramum	F32.1–F33.4; F33.8, F33.9
Sertralinum	F32.1–F33.4; F33.8, F33.9
Mirtazapinum	F32.1–F33.4; F33.8, F33.9
Second line treatment option by GPs, if first line treatment medication was not effective	
Clomipraminum	F32.1–F33.4; F33.8, F33.9
Venlafaxinum	F32.1–F33.4; F33.8, F33.9
Bupropionum	F32.1–F33.4; F33.8, F33.9
Escitalopramum	F32.1–F33.4; F33.8, F33.9
Fluvoxaminum	F32.1–F33.4; F33.8, F33.9
Tianeptinum	F32.1–F33.4; F33.8, F33.9
Agomelatinum	F32.1–F33.4; F33.8, F33.9
Prescribed by a psychiatrist. For patients if the previous 3 treatment courses were ineffective	
Bupropionum	F32.1–F33.4; F33.8, F33.9
Vortioxetinum	F32.1–F33.4; F33.8, F33.9
Other prescribed medication options by GPs	
Buspironum	F32.1–F33.4; F33.8, F33.9
Chlorprothixenum	F32.1–F33.4; F33.8, F33.9
Flupentixolum	F32.1–F33.4; F33.8, F33.9
Haloperidolum	F32.1–F33.4; F33.8, F33.9
Olanzapinum	F32.1–F33.4; F33.8, F33.9
Quetiapinum	F32.1–F33.4; F33.8, F33.9
Risperidonum	F32.1–F33.4; F33.8, F33.9
Sulpiridum	F32.1–F33.4; F33.8, F33.9
Trihexyphenidylum	F32.1–F33.4; F33.8, F33.9

among Latvians in PC [23,24,25]. However, there are only several studies which used Mini International Neuropsychiatric Interview (MINI) and Hospital Anxiety and Depression Scale (HAD) to recognize depression in PC in Lithuania [20–22]. According to recent data, more than half of the patients visiting the GP have undiagnosed mental disorders with most frequent mental disorders identified as a generalized anxiety disorder and major depressive disorder in Lithuania [20, 54]. Also, major depressive disorder is significantly underdiagnosed by GPs' in Latvia [25]. General practitioners say they feel responsible for the management of their patients' mental health problems, but they do not have enough knowledge, only 8.8% of GPs say they have sufficient knowledge in the mental health area and 86.4% would like to improve their knowledge [55]. In 2016, educational materials on depression, diagnostics and treatment of depression and neurotic disorders, and evaluation

of the effectiveness of therapy in primary care were developed in Latvia to reduce health problems and burden of depressive disorders [56]. Overall, 73% of Latvia GPs believe that their work with patients with a mental health profile should be improved. Just over half think their skills in counseling and educating patients and prescribing are very good (54%) or rather good (55%) [57]. Similarly, data from study by Sinkevicius et al. [58] showed that GPs also do not feel sure about their skills in treating depression in Lithuania. GPs who had additional training in mental health were more confident diagnose and treat depression [58]. Likewise, a very important factor is the stigmatization of depression by general practitioners - in study by Sinkevicius et al. [58], most of the surveyed physicians had misconceptions about depression in LT. We did not find data about GPs' stigmatization related issues to recognize, diagnose and treat depression in LV.

Increasing workload contributes to poor recognition and management of mental disorders in PC [5]. Researchers conducted in Lithuania had shown that patients with mental and behavioral disorders increased the workload of GPs' and visited GPs much more frequently [54, 59]. Patients with symptoms of depression posed a higher workload for GPs than patients without symptoms of depression [59]. This just confirms the level of the burden towards GPs practices [54]. This leads to a vicious cycle: Lithuanian general practitioners feel hopeless, depressed and burned out [60]. Latvian burnout data also shows high emotional exhaustion towards GPs' [61]. This fact is thought to be still underestimated by authorities.

There have been proposed measures which can improve mental disorders diagnostics by GPs' in Lithuania:

- mental health knowledge improvement;
- development of clear clinical guidelines for the management of mental disorders;
- improved possibilities for GPs to prescribe psychotropic drugs;
- financial incentives [55].

## DISCUSSION

Mental health problems and depression are getting more relevant in modern society with dramatic rising in primary care [62,63]. Knowing that PC services have a key role in provision of mental health, especially for patients with mild to moderate mental disorders, particularly with depression or major depressive disorder as one of the most common and under-recognized mental illnesses in PC [5,13,14,16,20,63–65]. Depression often goes undetected in PC because it co-occurs with many chronic physical conditions and can be comorbid with various somatic disorders [22,66], that is why clear agreement and guidelines on depression recognition, screening and diagnosing tactics are needed for PC specialists to follow. GPs in LV and LT indicate that some of them are lacking education and training which could affect the diagnosis of depressive disorder in PC [67]. This shows a significant weakness of PC systems – some researchers show that better training leads GPs to better practice [67,68]. Additional aspects that can influence the diagnosis are the time limitation per consultation and heavy workload [5,67]. Besides mentioned

problems, what makes the situation even more complicated is the stigma surrounding depression. We did not aim to analyze stigmatization of depression in PC, but it is already clear that more research should be done to evaluate the impact of depression stigmatization in Lithuanian and Latvian GPs' regular practices. Data show that stigma creates barriers for people who are suffering from depression and seeking medical help, and Lithuania has high multiple-discrimination against persons with depression [66]. Data show that these problems are found not only in Lithuania and Latvia but more globally as well [69].

As it is mentioned above, there are no clear recommendations how to screen and diagnose depression in PC, but also how to manage in secondary, and tertiary prevention strategies, especially in comorbid suicide cases, in both countries. Clear tactics, starting early screening, interventions for timely made diagnosis in PC is needed.

There are some differences between Lithuania and Latvia depression treatment in PC. Lithuanians GPs prescribe 100 % reimbursement antidepressants for F32.1, F33.1, F31.3 (only in patients with moderate depression) diagnosis [52] and Latvians' GPs prescribe 75 % reimbursement antidepressants for F32.1–F33.4; F33.8, F33.9 diagnosis [53]. If a satisfactory treatment effect is not achieved within 4–8 weeks, the GP may prescribe another SSRI or direct patient to a psychiatrist in Lithuania [51]. Latvia's GPs have to address their patients

for a psychiatrist consultation [50]. However, there are more similarities in depression management in PC between these countries. Once treatment is successful, secondary and tertiary prevention steps need to be provided for GPs to follow.

Based on GPs' self-reported low level of recognition, diagnosing and management skills, periodical training must be implemented in GPs qualification training yearly in order to start changing depression and related conditions management in PC in both, LT and LV. Certainly, there are more countries specific factors (availability of GPs, numbers of PC centers per 1000 inhabitants) and some other factors that may play a role in recognition and management of depression in PC [70]. We have not analyzed those and other country-specific factors in our review and it is a limitation of the study. In low-income countries, the rate of mental health workers can be as low as 2 per 100 000 population, compared with more than 70 in high-income countries [71]. Despite that both Lithuania and Latvia qualify as high income countries, according to the World Bank data [72,73], depression management remains poor in PC, what also needs to be better investigated as possible, related reason towards depression management in PC in both countries.

## DECLARATION OF INTEREST

All authors declare no conflict of interest.

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# Communication of research findings in peer-review literature: bibliometric index analysis of Lithuanian psychiatrists

## Mokslo tyrimų rezultatų sklaida tarptautiniuose recenzuojamuose mokslo žurnaluose: Lietuvos psichiatrių bibliometrinių indeksų analizė

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### SUMMARY

**Objective.** Communication of research findings in peer-reviewed literature is integral part of academic medicine. Qualitative and quantitative indexes of academic productivity are increasingly studied and used for promotion purposes and for ranking of physicians working in academia. For the first time we evaluated bibliometric indexes of psychiatrists practicing in Lithuanian universities.

**Methods.** We explored Pubmed/MEDLINE and Clarivate Analytics databases and extracted total number of publications, number of citations and h-index of 36 psychiatrists practicing in two major academic centers in Lithuania. Selected bibliometric indexes were compared as function of academic rank, presence of research degree and gender.

**Results.** There were 21 (58%) women and 15 (42%) men. Fifteen (42%) psychiatrists had a PhD degree. There were 5 (14%) professors, 8 (22%) assistant or associate professors and 23 (64%) psychiatrists without listed academic rank. The mean number of publications indexed in the Pubmed/MEDLINE database was  $4.58 \pm 7.75$  and the mean number of publications indexed in the Clarivate Analytics (Web of Science) database was  $6.56 \pm 13.45$ . Average number of citations was  $30.03 \pm 75.42$ . Mean h-index was  $1.42 \pm 2.26$ , and the highest h-index was 8. Academic psychiatrists holding a PhD degree had significantly greater number of publications, received more citations and had greater h-index. Professors when compared to assistant and associate professors and to psychiatrists not holding an academic rank had more publications and citations, and had greater h-index. All investigated bibliometric indexes were similar between men and women.

**Conclusions.** Bibliometric indexes are increasingly used and studied in academic medicine. Our study provides a benchmark of quantity and quality of research dissemination in peer-reviewed literature in Lithuanian psychiatrists. We found that bibliometric indexes correlated with higher academic rank and advanced research training. We did not find gender disparities in the studied bibliometric indexes of Lithuanian psychiatrists

**Keywords:** h-index; psychiatrists; academic productivity

### SANTRAUKA

**Įvadas.** Mokslinių tyrimų rezultatų sklaida recenzuojamuose moksliniuose žurnaluose yra neatskiriama akademinės medicinos dalis. Atliekama vis daugiau mokslinių tyrimų analizuojančių kiekybinius ir kokybinius akademinio produktyvumo rodiklius. Šie rodikliai dažnai naudojami akademinį įstaigų reitingavimui bei mokslininkų akademinį pasiekimų objektyviam vertinimui. Šiame tyrime pirmą kartą ištyrėme Lietuvos universitetinėse ligoninėse praktikuojančių psichiatrių bibliometrinius rodiklius.

**Metodai.** Išanalizavome Lietuvos universitetinėse ligoninėse praktikuojančių gydytojų psichiatrių bibliometrinius rodiklius pateikiamus Pubmed/MEDLINE ir Clarivate Analytics duomenų bazėse, tokius kaip publikacijų skaičius, citavimų skaičius ir h-indeksas. Bibliometriniai rodikliai lyginti atsižvelgiant į gydytojo psichiatro pedagoginį laipsnį/pareigas, mokslų daktaro laipsnio turėjimą ir lytį.

**Rezultatai.** Įmity sudarė 36 psichiatrai dirbantys dviejose Lietuvos akademinėse gydymo įstaigose: 21 (58 proc.) moteris ir 15 (42 proc.) vyrų. Penkiolika (42 proc.) psichiatrių turėjo mokslo daktaro laipsnį. Įmity sudarė 5 (14 proc.) profesorai, 8 (22 proc.) docentai arba lektoriai ir 23 (64 proc.) psichiatrai neturintys akademinio laipsnio. Vidutinis publikacijų indeksuojamų Pubmed/MEDLINE duomenų bazėje skaičius tenkantis vienam psichiatrai buvo  $4.58 \pm 7.75$ , ir vidutinis publikacijų indeksuojamų Clarivate Analytics (*Web of Science*) duomenų bazėje skaičius tenkantis vienam psichiatrai buvo  $6.56 \pm 13.45$ . Vidutinis citatų skaičius tenkantis vienam psichiatrai buvo  $30.03 \pm 75.42$ . Vidutinis h-indeksas buvo  $1.42 \pm 2.26$ , didžiausias h-indeksas buvo 8. Lyginant su psichiatrais neturinčiais mokslo laipsnio, psichiatrai turintys mokslo laipsnį buvo paskelbę daugiau publikacijų, jų mokslo darbai buvo dažniau cituojami ir jie turėjo aukštesnį h-indeksą. Profesorai, lyginant su docентаis, asistentai ir psichiatrais be akademinio laipsnio, buvo paskelbę daugiau publikacijų, jų publikacijos buvo dažniau cituotos bei jų h-indeksas buvo aukštesnis. Nenustatėme analizuotų akademinio produktyvumo indeksų skirtumų tarp vyrų ir moterų.

**Išvados.** Bibliometriniai indeksai yra vis dažniau naudojami akademinėje medicinoje. Tai yra pirmas tyrimas analizuojantis akademinio produktyvumo indeksus tarptautinėse duomenų bazėse indeksuojamuose žurnaluose tarp Lietuvos psichiatrių. Nustatėme, kad akademinis produktyvumas buvo aukštesnis tarp psichiatrių turinčių mokslo laipsnį bei tarp profesorų. Nenustatėme ryšio tarp lyties ir analizuotų bibliometrinių indeksų.

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## INTRODUCTION

Research is an indispensable and integral component of academic medicine driving development of innovative diagnostic and treatment approaches that subsequently are expected to translate into improved patient care. Dissemination of research findings in peer-reviewed literature is the most commonly used method to disseminate research finding to peers worldwide. Total number of publications is simple and most commonly used quantitative metric of researcher's academic productivity [1–3]. However, it does take into account quality of the research that is usually judged by the number of citations. Hence, journal's impact factor is often considered to define quality of scientific output because it reflects mean number of citations of published papers, and greater impact factor of a journal is often associated with more rigorous editorial process, more stringent selection higher quality research papers. Citation count and other bibliometric indexes are also often employed to assess quality of a research paper and individual researcher. For example, higher citation count of a paper and papers published by a researcher (or a group) mirrors greater scientific impact of a research. Hirsch index (h-index) takes into account both the number of publications of a researcher as well as the number of citations per publication and is the most widely used qualitative bibliometric index [4]. For example, a researcher who has authored 20 publication of which 7 publications received at least 7 citations would have a h-index of 7. Nevertheless, limitations of the h-index as well as other qualitative and quantitative citation metrics should be considered. For example, a researcher with longer academic career is expected to have acquired greater number of publication and citations and hence would have higher h-index than more junior colleagues. To solve this problem, m-quotient was developed and it adjusts h-index for years of duration of one's academic career by dividing an h-index by years since the first publication. For example, m-quotient of 0.5 would indicate that researcher's h-index increases by 0.5 points every year since the date of his/hers first publication. Qualitative and quantitative citation indexes can be obtained from various indexing databases (for example, Scopus, Clarivate Analytics and Google Scholar) that use different journal selection criteria and therefore can producing different bibliometric indexes for the same researcher.

Studies exploring academic productivity academic psychiatrists is growing [5–7]. In academic psychiatrists there is a positive correlation between greater academic productivity and higher academic rank [6,7]. Full professors had higher h-index and greater number of citations, followed by associate professors and assistant professors [7]. Furthermore, higher h-index of psychiatrists is associated with greater likelihood of securing research funding [8]. A recent analysis of academic productivity indexes obtained from the Web of Science (Thomson Reuters) of 1683 faculty members of academic psychiatry departments in Canada noted a large variability of academic productivity indexes [7]. Others also noted gender disparities in academic productivity of psychiatrists with women having lower academic productivity indexes when compared to men [5]. There are not studies exploring

academic productivity of academic psychiatrists in Lithuania. Consequentially, we investigated commonly used quantitative and qualitative bibliometric indexes of psychiatrists affiliated with academic hospitals in Lithuania.

## METHODS

Psychiatrists practicing at two major academic hospitals in Lithuania were identified from respective websites on December, 20, 2019: (1) Hospital of Lithuanian University of Health Sciences Kaunas Clinic (<https://kontaktai.lsmuni.lt/lt/kontaktai/sarasas?populate=psichiatrijos+klinika>) and (2) Vilnius University, Faculty of Medicine, Clinic of Psychiatry (<https://www.mf.vu.lt/en/institutes/institute-of-clinical-medicine/clinic-of-psychiatry#publications-by-academic-staff>). Websites were reviewed to identify all practicing psychiatrists within each department, their gender, listed highest academic rank and whether they had an advanced research degree (PhD). Psychologists and other supporting personnel (if any) listed in the department websites were not selected.

## BIBLIOMETRIC ANALYSIS

Qualitative and quantitative bibliometric indexes of all identified psychiatrists were obtained from the Web of Knowledge database and PubMed/MEDLINE database. Databases were analyzed on December 15, 2019. All psychiatrists were queried in both databases. All authors received the same credit for multi-authored publications.

The PubMed/MEDLINE (<https://www.ncbi.nlm.nih.gov/pubmed>) database was used to identify the total number of publications authored in indexed journals. Search function was used by inputting author's last name and first name.

The Web of Knowledge/Clarivate Analytics (<https://login.webofknowledge.com>) database was queried to determine the total number of listed indexed publications (research papers and conference abstracts), total number of citations and h-index. H-index was automatically calculated and provided by the database. Authors were queried using the search ("Author") function by inputting authors' last name and first name.

## Statistical analysis

Independent sample t-test or ANOVA analysis was used as appropriate to compare mean values of all academic productivity indexes of identified psychiatrists. Academic productivity indexes were compared as a function of gender (men vs. women), presence of advanced research degree (Ph.D. vs. no research degree), and academic rank (full professor vs. associate or assistant professor vs. no academic rank).

The SPSS for Windows was used for statistical comparison (Armonk, NY: IBM Corp). All reported p-values are 2-sided, p values of < 0.05. Values are presented as mean ± Standard deviation, median [interquartile range] and minimal value-maximal value.

## RESULTS

From institutional websites we identified 36 psychiatrists practicing in two academic medical centers. There were 21

(58%) women and 15 (42%) men. Fifteen (42%) psychiatrists had a PhD degree. There were 5 (14%) professors, 8 (22%) assistant or associate professors and 23 (64%) psychiatrists without listed academic rank.

In the total sample, the mean number of publications in journals indexed in the Pubmed/MEDLINE database was  $4.58 \pm 7.75$  and ranged from 0 to 30 publications (Table 1). Mean number of publications (research papers and indexed conference abstracts) indexed in the Clarivate Analytics (Web of Science) database was  $6.56 \pm 13.45$ . Average number of citations of analyzed faculty members was  $30.03 \pm 75.42$  and ranged from 0 to 397. Mean h-index was  $1.42 \pm 2.26$ , and the highest h-index was 8.

Next, we examined the association of advanced research degree with academic productivity (Table 2). We found that when compared to academic psychiatrists without advanced research training, those holding a PhD degree had significantly greater number of publications indexed in Pubmed/MEDLINE database ( $0.48 \pm 0.60$  and  $10.33 \pm 9.42$ , respectively,  $p < 0.001$ ) and Clarivate Analytics (Web of Science) database ( $0.71 \pm 1.15$  and  $14.73 \pm 18.09$ , respectively,  $p = 0.001$ ), received greater number of citations ( $1.14 \pm 5.01$  and  $70.47 \pm 105.74$ , respectively,  $p = 0.005$ ) and had higher h-index ( $0.10 \pm 0.30$  and  $3.27 \pm 2.52$ , respectively,  $p = 0.001$ ).

As expected, higher academic rank was associated with higher quantitative and qualitative bibliometric indexes (Table 3). The association was positive and linear. Specifically, the number of publications indexed in the Pubmed/MEDLINE database and Clarivate Analytics (Web of Science) database, number of citations and h-index were the highest for professors when compared to assistant and associate professors and to psychiatrists not holding academic rank (all  $p$  values  $< 0.001$ ). Psychiatrist not holding academic rank had lower academic productivity indexes relative to associate and assistant professors.

We did not find statistically significant differences between men and women in the total publications indexed in the Pubmed/MEDLINE ( $p = 0.87$ ) and Clarivate Analytics (Web of Science) databases ( $p = 0.41$ ), number of citations ( $p = 0.48$ ) and h-index ( $p = 0.86$ ).

## DISCUSSION

This is the first study that evaluated number of publications (as a proxy of research dissemination in peer-reviewed literature) and commonly used bibliometric indexes

**Table 2. Association of academic productive with advanced research degree (PhD)**

	PhD degree		
	Yes, N=15	No, N=21	p-value
Pubmed/MEDLINE database			
Number of publications	$10.33 \pm 9.42$	$0.48 \pm 0.60$	$<0.001$
Clarivate Analytics (Web of Science)			
Number of publications	$14.73 \pm 18.09$	$0.71 \pm 1.15$	0.001
Number of Citations	$70.47 \pm 105.74$	$1.14 \pm 5.01$	0.005
H-index	$3.27 \pm 2.52$	$0.10 \pm 0.30$	$<0.001$

of psychiatrists practicing in two academic medical centers in Lithuania. We found that bibliometric indexes were greater in psychiatrists holding advanced research degree. There was a linear association between greater academic productivity and higher academic rank. Gender was not associated with all investigated indexes.

This study provides a benchmark of qualitative and quantitative bibliometric indexes of Lithuanian psychiatrists affiliated with academic centers. To the best of our knowledge, this is the first study of this kind in Lithuanian psychiatrists. Bibliometric indexes are becoming increasingly considered and studied in psychiatry [5,7] and other clinical disciplines, such as neurosurgery [3], general surgery [9], neurology [10] and others. This is also one of the first studies of this kind in Lithuania with one prior study in dentistry specialists of Lithuania, Latvia and Estonia [11]. Objective measures of academic productivity are often considered for promotion purposes, when considering research grant applications and for ranking of individual physician-scientists and academic institutions and departments. However, given inherent limitations of these metrics, and underlying concepts and calculations, strengths and limitations of each index should be considered within the context of assessment. For example, while h-index is the most commonly used measures to assesses one's quantity and quality of scientific output, but it is heavily influenced by the duration of his/hers academic career, hence m-quotient should be preferably considered when evaluating junior faculty members and/or comparing them to more senior colleagues.

Mean number of publications ranged from 3.7 in Pubmed database to 5 in Clarivate analytics database. It should be considered that Clarivate analytics database indexes certain

**Table 1. Descriptive statistics of academic productivity indexes of Lithuanian academic psychiatrists**

	Mean $\pm$ SD	Median [interquartile range]	Minimal–maximal values
Pubmed/MEDLINE database			
Number of publications	$4.58 \pm 7.75$	1 [7]	0–30
Clarivate Analytics (Web of Science)			
Number of publications	$6.56 \pm 13.45$	1 [8]	0–73
Number of Citations	$30.03 \pm 75.42$	0 [22]	0–397
H-index	$1.42 \pm 2.26$	0 [2]	0–8

Table 3. Association of academic productive with research rank

	Academic rank			p-value
	Professor, N=5	Associated or assistant professor, N=8	No rank, N=23	
	Pubmed/MEDLINE database			
Number of publications	20.20 ± 8.56	6.63 ± 4.78	0.48 ± 0.59	<0.001
	Clarivate Analytics (Web of Science)			
Number of publications	27.60 ± 25.74	7.88 ± 8.31	1.52 ± 4.18	<0.001
Number of Citations	152.2 ± 155.73	36.88 ± 32.29	1.09 ± 4.79	<0.001
H-index	5.20 ± 3.03	2.75 ± 1.49	0.13 ± 0.341	<0.001

conference proceedings, hence it might include more records that are subjected to less rigorous editorial evaluation when compared to research papers. On the other hand, Pubmed database indexes mainly research papers published in the indexed journals. Mean h-index of academic psychiatrists was 1 and the highest h-index of an academic psychiatrist was 8. Large variability of h-index was noted in prior study of 1683 academic psychiatrists in Canada [7].

As expected, there was a positive association between academic rank and all investigated bibliometric indexes with full professors having the greatest productivity when compared to associate/assistant professors and faculty members without academic rank. These findings are in line with prior studies of psychiatrists in Canada [7]. Similarly, a positive linear association between greater research output and higher academic rank was documented in other medical and surgical specialties, including neurosurgery [3], general surgery [9] and craniofacial surgery [12]) among others. These findings support the use of objective academic productivity indexes for promotion purposes in academic medicine, including psychiatry.

All bibliometric indexes were higher in faculty members holding advanced research degree when compared to those who did not. This is not surprising as advanced research training provides an opportunity to gain skills and knowledge required to succeed in academic career. Similar association between research training and academic output was previously documented in neurosurgeons practicing in Great Britain [13], Germany [14] and USA [15]. These findings suggest that faculty members wishing to pursue physician-scientist career should be supported with additional protected time to gain research experience.

We did not find association between gender and academic productivity. This is in juxtaposition to previous study in Canadian academic psychiatrists showing that among junior faculty members, women had lower h-index and less publication when compared to men [5]. Similar findings were also noted in neurology departments in the USA [10]. However, studies in academic radiology faculty members found similar academic productivity indexes between men and women [16] or found that women at professor level had more publications when compared to men [17]. While further studies remain to elucidate gender impact on academic career in medical fields, but equal opportunities should be present for both women and men aspiring to succeed in academic medicine.

Our study has limitation. Firstly, some commonly used indexing databases, such as Scopus and Google Scholar, were not examined. However, despite differences in journal indexing requirements between databases, a strong correlation of number of papers and citations is expected. Certain factors, such as time since the first publication and age, that can be associated with academic productivity, were not considered. We studied psychiatrists affiliated with academic centers and it is possible that academic requirements and expectations as well as direct involvement in research activities are different between affiliated physicians. Finally, other academic productivity indexes, such as the m-quotient, remain to be investigated as it can be more sensitive index of academic success of junior faculty members.

## CONCLUSIONS

Objective quantitative and qualitative bibliometric indexes are increasingly used and studied in academic medicine. Our study provides a benchmark of research dissemination in peer-reviewed literature in Lithuanian psychiatrists and the impact of research output. We found that bibliometric indexes increased with higher academic rank and advanced research training. We did not find gender disparities in academic productivity of Lithuanian psychiatrists. Further studies comparing academic psychiatry between countries, regions and areas of practice are encouraged.



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# Suicidal thoughts, intentions and suicide attempts by Lithuanian medical students of the Lithuanian University of Health Sciences

## Lietuvos sveikatos mokslų universiteto lietuvių medicinos studentų mintys, ketinimai bei bandymai nusižudyti

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### SUMMARY

**Introduction.** Medical students are particularly stressed during their studies. There is a very strong association between chronic stress, depression and suicidal ideation, which can lead to suicidal actions or even suicide.

**Aim.** To find out the prevalence of thoughts/intentions/suicide attempts of medical students of LUHS, their differences between genders and courses, and possible causes of suicidal ideations.

**Material and methods.** Anonymous questionnaire survey of Lithuanian medical students of LUHS I-VI year students was carried out on 2019. The questionnaire consisted of questions designed by the researchers to look at demographics, smoking and drug use rates, prevalence of thoughts/intentions/suicide attempts, open questions to identify mental disorders and possible causes of suicidal attempts, and the AUDIT-C test.

**Results.** 45% of medical students have thoughts of suicide and 2.8% had thoughts of suicide during the survey. 16% of students had an intention to commit suicide. 1.2% had such intentions at the time of the survey. 5.9% have tried to commit suicide. Causes of suicide during studies are very diverse: high levels of stress, psychological pressure, competition, burnout, extreme workloads, and other.

Men more often than women had suicidal thoughts and intentions. No statistically significant differences were found in the prevalence of thoughts/intentions/suicide attempts and the reasons among medical students in different courses.

**Conclusions.** 45% of medical students reported history of suicidal thoughts; 2.8% of the respondents had such thoughts during the survey. Every sixth of the respondents reported suicide plans. 1.2% of medical students had such intentions during the survey. 6.2% of students have tried to commit a suicide. The most common causes of suicidal ideations during study years are very different: stress, psychological pressure, high workload, competition, fatigue and burnout, personal life problems, lack of leisure time, bullying, high expectations of self/others. Men more often than girls had suicidal thoughts and intentions, without significant differences in the prevalence of thoughts/intentions/suicide attempts and the reasons in differences causes of students.

**Keywords.** medical students, suicidal thoughts/ intentions, LUHS.

### SANTRAUKA

**Ivadas.** Medicinos studentai savo studijų metu patiria ypač daug streso, o visa tai gali turėti įtakos jų psichikos sveikatai. Egzistuoja labai stiprus ryšys tarp lėtinio streso, depresijos bei minčių apie savižudybę, kurių pasekmės gali pasireikšti kaip savižudiški veiksmai ar savižudybė.

**Tikslas.** Išsiaiškinti Lietuvos sveikatos mokslų universiteto (LSMU) I-VI kurso medicinos studentų savižudiškų minčių/ ketinimų/ bandymų nusižudyti paplitimą, viso to skirtumus tarp lyčių ir skirtingų kursų bei galimas savižudiškų tendencijų priežastis.

**Medžiaga ir metodai.** 2019 metais buvo atlikta anoniminė LSMU I-VI kurso lietuvių medicinos studentų anketinė apklausa. Anketa buvo sudaryta iš tyrėjos kurtų klausimų, kuriais buvo siekiama išsiaiškinti demografinius duomenis, rūkymo bei narkotikų vartojimo dažnį, minčių/ketinimų/bandymų nusižudyti paplitimą, atvirų klausimų forma buvo siekiama išsiaiškinti sergamumą psichikos sutrikimais bei galimas savižudiškų bandymų priežastis, bei AUDIT-C testo, kuriuo buvo siekiama išsiaiškinti rizikingą alkoholio vartojimo lygį.

**Rezultatai.** Keturiasdešimt penkiems proc. medicinos studentų yra kilę minčių apie savižudybę, 2,8 proc. apklaustųjų tokių minčių turėjo apklausos metu. Ketinimų nusižudyti turėjo apie 16 proc. apklaustųjų. 1,2 proc. medicinos studentų tokių ketinimų turėjo apklausos metu. Nusižudyti buvo bandę 5,9 proc. apklaustųjų. 58,4 proc. apklaustųjų buvo girdę apie įvykusias savižudybes tarp LSMU medicinos studentų. Priežastys dėl kurių įvyksta savižudybės studijų metu yra labai įvairios: didelis stresas, psichologinis spaudimas, konkurencija, perdegimas, studijų ir darbo perspektyvų beprasmybė, didelis mokymosi krūvis ir kitos. Vaikiniai dažniau nei merginos apklausos metu turėjo minčių apie savižudybę bei ketinimų. Jokių statistiškai reikšmingų skirtumų tarp minčių/ketinimų/bandymų nusižudyti paplitimo bei jų priežasčių tarp skirtingo kurso medicinos studentų nenustatyta.

**Išvados.** 45 proc. medicinos studentų pranešė turę minčių apie savižudybę, 2,8 proc. apklaustųjų tokių minčių turėjo apklausos metu. Ketinimų nusižudyti turėjo kas šeštas apklaustasis, o 1,2 proc. medicinos studentų tokių ketinimų turėjo apklausos metu; 6,2 proc. apklaustųjų buvo bandę žudyti. Dažniausios priežastys savižudiškoms tendencijoms studijų metu: didelis stresas, psichologinis spaudimas, didelis mokymosi krūvis, konkurencija, pervargimas ir perdegimas, asmeninio gyvenimo problemos, patiriama įtampa, laisvalaikio stoka, patyčios, dideli lūkesčiai iš savęs/aplinkinių. Vaikiniai dažniau nei merginos apklausos metu turėjo minčių apie savižudybę bei ketinimų, bet nenustatyta reikšmingų skirtumų tarp minčių/ketinimų/bandymų nusižudyti paplitimo bei priežasčių skirtumo tarp skirtingo kurso medicinos studentų.

**Raktiniai žodžiai:** medicinos studentai, savižudiškos mintys/ ketinimai, LSMU

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## INTRODUCTION

Medical students are under a great deal of stress throughout the six years of the study because of the high academic standards placed upon them. All of this can affect both somatic and mental health of future physicians. The incidence of mental health problems among medical students has been shown to be constantly increasing and higher than for other specialty students and the general population [1,2].

The most common mental health problem in the world among future doctors unfortunately is depression [3]. One third of medical students in the world are affected by this disorder, but very few of them are cured [4].

Depression is considered to be the most important factor affecting attempts to suicide [1,5]. Other factors contributing to suicidal ideation include chronic stress, desire to quit medical studies, sleep disorders, anxiety, previous psychiatric diagnosis, low socioeconomic status, financial difficulties, grades, academic burden, introversion / extraversion, current or past drug use, feeling anxious parents [1,3,5-9]. It is noted that there is a very strong association between chronic stress, depression and suicidal ideation [8]. Coentre and colleagues peer-reviewed research papers on suicidal ideations by prospective physicians and found that the incidence was between 1.8 % and 53.6 %. [5]. The consequences of suicidal ideation can be manifested as suicidal actions and completed suicide [5,10].

It was found that in the first years of medical education, the mental health of young people is no different from that of their peers, but medical students experience burnout syndrome, depression and other mental disorders more often and intensively than young people of other specialties [11]. Suicidal ideations among medical students is not a popular research topic in Lithuania. Only one Master's thesis has been carried out on this topic by Erika Keršytė [12]. She found that nearly a quarter of LUHS students have suicidal tendencies, while those who consume alcohol were more likely. As this topic is not a widely analysed in Lithuania, it would be important to find out the prevalence of LUHS medical students' thoughts/intentions/suicide attempts and the possible causes of suicidal ideations.

**The aim.** To find out the prevalence of thoughts/intentions/suicide attempts of medical students of Lithuanian University of Health Sciences (LUHS), their possible causes and the differences between genders and courses.

## METHODOLOGY

The survey was conducted between April and July 2019. Lithuanian medical students of Lithuanian University of Health Sciences (LUHS) were invited to participate in this study. Questionnaires were distributed before the lectures, practical work and self-study in the library to find out socio-demographic characteristics, risk of alcohol consumption, smoking and frequency of drug use, prevalence of thoughts/intentions/suicide attempts, mental illness, possible causes of suicide. The AUDIT-C test [13], which consists of the first three questions in the AUDIT questionnaire, was used to find out risky levels of alcohol consumption. This level of use was found when men scored 4 or more (out of 12 possible) and

women scored 3 or more (out of 12) [13]. Researcher-designed questions aimed at finding out the prevalence of smoking and drug use, the prevalence of thoughts/intentions/suicide attempts among medical students, and open-ended questions aimed at identifying student morbidity (Are you currently suffering from/had a mental disorders: depression, anxiety, addictions, schizophrenia, etc.? If so, what?) and possible causes of suicide (In your opinion, what are the reasons for suicide during medical studies/why did you try to quit life?). The submitted questionnaires were requested to be completed and returned by the researchers. The name and other personal details were not requested in the questionnaire survey. Only fully completed questionnaires were included in the analysis of the study data.

The software package SPSS 23.0 was used to analyze the results. The statistical significance level chosen was 0.05. First, the normality of the distributions was checked. According to the Kolmogorov-Smirnov criterion, all distributions were statistically significantly different from normal. As a result, the Mann Whitney nonparametric criterion for two independent samples, the Kruskal-Wallis criterion for comparing several independent samples, as well as the Chi square criterion for nominal variables were used to compare averages.

The study was authorized by the LUHS Bioethics Center. Publication Number: BEC- MF-362.

## RESULTS

The study involved 322 LUHS medical students of I–VI courses. 62 (19.3%) of them were men and 260 (80.7%) were women. The distribution of subjects by study course is presented in Figure 1.

### Prevalence of medical students suicidal thoughts/intentions/suicide attempts.

The first task of the study was to determine the prevalence of medical students' thoughts/intentions/suicide attempts. To assess this, we first asked the question: Have you ever had suicidal thoughts? The answers are shown in Figure 2.

Figure 3 shows that about half of the students have suicidal thoughts, 2.8% respondents had such thoughts during the survey. The third figure shows that as much as 23% students have had suicidal thoughts many times.

Approximately 16% of the respondents had a suicidal intentions (1.2% had this intention at the time of the survey), and about 6% of students had a suicide intention more than

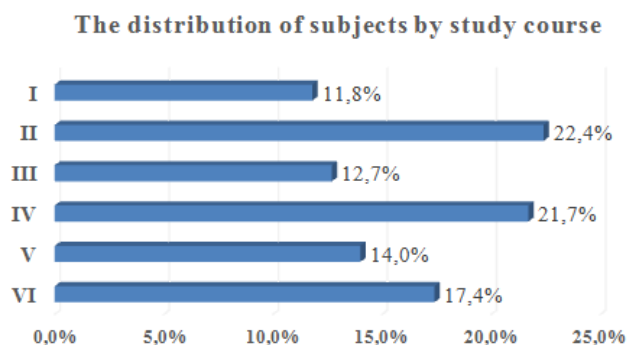


Figure 1. The distribution of subjects by study course

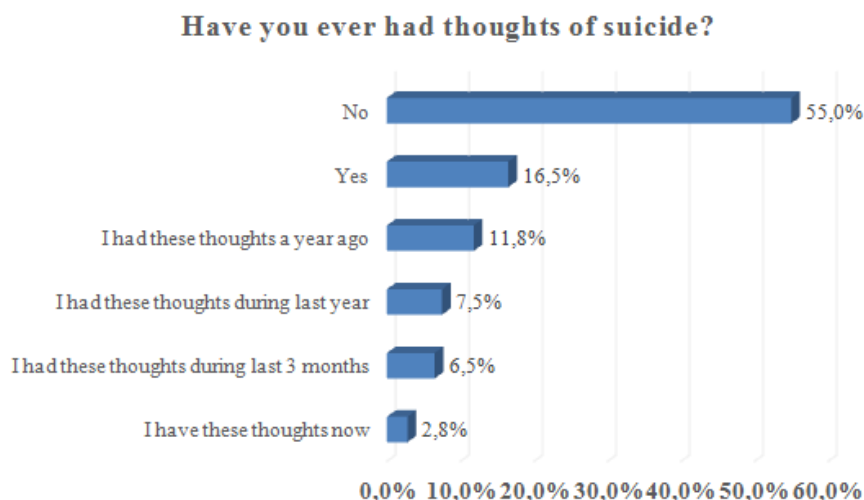


Figure 2. Suicidal thoughts among medical students

twice (Fig. 4).

As shown at Figure 5, 5.9 % of study participants- medical students have attempted suicide. Approximately 2% of them attempted suicide more than once (Fig. 5).

More than half (58.4%) of the respondents have heard of suicides among LUHS medical students, on average 2–3 such cases, and they have heard about attempts to commit suicide even more (up to 10 cases).

#### The reasons for medical students' thoughts/ intentions/ suicide attempts

The second task was to find out the reasons for medical students' thoughts/intentions/suicide attempts. When asked to identify the reasons for suicidal thought or suicidal attempts during the medical studies, students most often mentioned the reasons listed in Table 1.

Table 1 shows that the main causes of suicide among LUHS medical students of year I–VI are stress 15.2%, pressure 12% and high study load 11.5 %. All these reasons are related to studies. Academic community of LUHS should take more attention to it and try to reduce these causes among medical students. The resulting feelings of hopelessness, sadness, frustration, self-loathing, loneliness, constant anxiety, depression, and poor knowledge of how to take care of one's

mental health lead to thoughts, intentions or suicide attempts.

The results of the study revealed that 8.1% of students had a mental disorder (depression, anxiety disorders, bulimia, schizophrenia), 6.5% had a history of mental health depression, adjustment disorder, anxiety disorders, anorexia, bulimia) 4.7% used psychotropic medications during the survey, 9.9% had used medication during lifetime. 88.8% of students time to time used alcohol. The mean of the AUDIT-C test scores was  $5.75 \pm 2.11$  at a rate of 0–4 for men and 0–3 for women.

19.9% of respondents were smoking, 3.1% were using drugs. All of these factors could be rated and be a risk factors for medical student suicidal thoughts or attempts.

#### Differences in medical students' thoughts/intentions/ suicide attempts between genders and across courses

Another task of the study was to assess the differences of thoughts/intentions/suicide attempts of medical students in different genders of LUHS I–VI courses.

The results showed that men statistically ( $p = 0.008$ ) more often than women had suicidal thoughts (Table 2).

Similarly, with the intention to suicide, it seems that statistically significant ( $p = 0.014$ ) men had a higher frequency than women during their survey (Table 3).

Regarding suicide attempts, again, the results show that

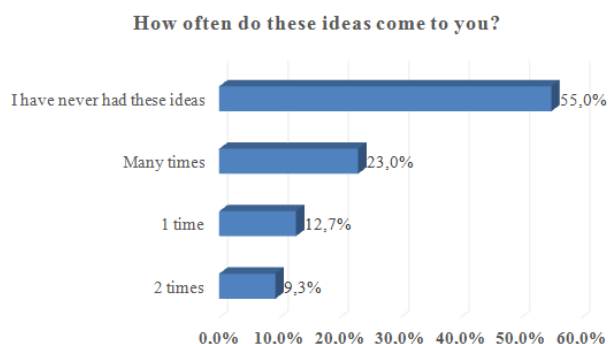


Figure 3. The incidence of suicidal thoughts among medical students

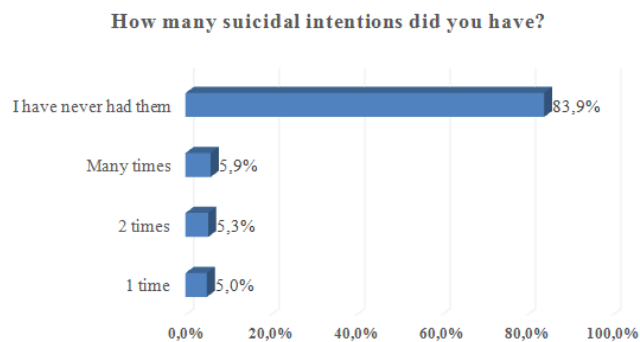


Figure 4. The incidence of suicide intentions among medical students



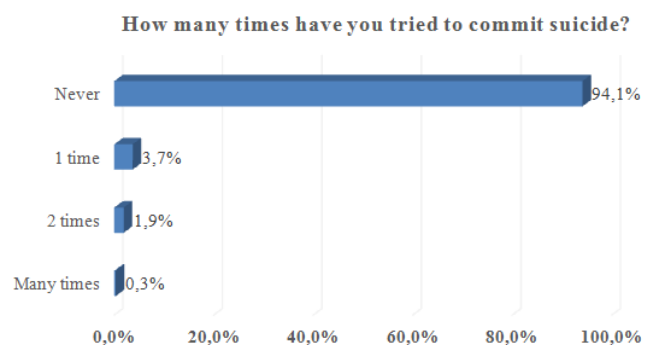


Figure 5. The incidence of suicide attempts among medical students

men were statistically significantly ( $p = 0.032$ ) more likely than women to attempt suicide more than once (Table 4).

No statistically significant differences were found in the prevalence of suicide among men and women.

No statistically significant ( $p > 0.05$ ) differences were found in the prevalence of thoughts/intentions/suicide attempts among medical students of different courses. In fact, there are different answers to the question of whether they have heard of suicides among LUHS medical students. It seems that first and second year students have statistically significantly ( $p = 0.001$ ) less often heard of such events (Table 5).

## DISCUSSION

The study revealed that even half of LUHS Lithuanian medical students had suicidal thoughts, while 2.8% of respondents had such thoughts during the survey. Approximately 16 % of those surveyed had suicide intentions, and 1.2% of them had such intentions during the survey. As many as 5.9% of medical students have attempted suicide. These are very shocking and distressing results, because at any time such thoughts can move on to intentions and suicide attempts. There are a number of studies from other parts of the world looking at medical students' thoughts / intentions / suicide attempts, which are very different. We have mentioned several such studies in Table 6.

Comparison of these studies with our study reveals considerable differences. It has been mentioned that as many as 45% of LUHS Lithuanian medical students have thoughts of suicide, which is significantly more than students of other countries [14,15,16]. Our study also found that 2.8% of those surveyed had suicidal ideation at the time of the survey, which is less than Torres and colleagues in Brazil [6], but more than Amiri and colleagues in the United Arab Emirates [14].

Table 1. Possible causes of suicide among LUHS medical students of year I-VI

Cause	Number of respondents	Percentage (%)
Stress	99	15.2
Pressure	78	12.0
High study load	75	11.5
High competition	54	8.3
Fatigue and burnout	35	5.3
Personal life issues	34	5.2
Tension	27	4.1
Lack of leisure	24	3.6
Bullying	22	3.3
High expectations from oneself / others	20	3.0
Hard studies	19	2.9
Loneliness	19	2.9
Poor self-esteem	17	2.6
Mental Illness	15	2.3
Fear of the future	14	2.1
Misfortune	14	2.1
Lack of support from loved ones	14	2.1
Fear of not meeting parents' expectations	14	2.1
Marks	12	1.8
High demands	11	1.6
Financial difficulties	9	1.3
High perfectionism	8	1.2
Dissatisfaction with own results	5	0.7
Unhappy Love	4	0.6
Mistakes	2	0.3
Lack of assistance	1	0.1

If we treat suicide as having a suicide plan, it would appear that medical students in our country are much more likely to commit suicide than would-be doctors in other countries. [15,16,17]. Another shocking fact is that LUHS I-VI medical students are much more likely to commit suicide than other students. [14–17]. Summarizing the researches it can be stated that Lithuanian medical students of LUHS I-VI course have one of the highest thoughts/intentions/suicide attempts in the world.

Table 2. Thoughts of suicide among men and women

Gender	Have you ever had thoughts of suicide?						p-value
	no	yes	I have these thoughts now	I have had such thoughts for the last three months	I have had such thoughts in recent years	I had such thoughts more than a year ago	
Men, n=62	32 (51.6%)	12 (19.4%)	6 (9.7%)	4 (6.5%)	4 (6.5%)	4 (6.5%)	0.008
Women, n=260	145 (55.8%)	41 (15.8%)	3 (1.2%)	17 (6.5%)	20 (7.7%)	34 (13.1%)	

Table 3. Intentions of suicide among men and women

Gender	Have you ever had suicide intentions?			p-value
	no	yes	Yes ( i have these thought now)	
Men, n=62	49 (79.0%)	10 (16.1%)	3 (4.8%)	0.014
Women, n=260	224 (86,2%)	35 (13,5%)	1 (0,4%)	

Table 4. Suicide attempts among men and women

Gender	How many times did you try to commit suicide?				p-value
	I have never tried	1 time	2 times	Many times	
Men, n=62	57 (91.9%)	1 (1.6%)	3 (4.8%)	1 (1.6%)	p= 0.032
Women, n=260	246 (94.6%)	11 (4.2%)	3 (1.2%)	0 (0.0%)	

Table 5. Knowledge of suicide among LUHS students, among different course students

Course (grade)	Have you heard of suicides among LUHS medical students?		p-value
	Yes	No	
I grade, n=38	9 (23.7%)	29 (76.3%)	0.0001
II grade, n=72	31 (43.1%)	41 (56.9%)	
III grade, n=41	34 (82.9%)	7 (17.1%)	
IV grade, n=70	44 (62.9%)	26 (37.1%)	
V grade, n=45	29 (64.4%)	16 (35.6%)	
VI grade, n=56	41 (73.2%)	15 (26.8%)	

Respondents in our study identified a variety of causes that could lead to suicide: high levels of stress, psychological pressure, competition, burnout, futility of study and work prospects, “cold, cynical, competitive relationships between students”, excessive workload, demands, expectations, personal reasons, alcohol, low self-esteem, “old-fashioned thinking of teachers that prevents growth, sets the bullet points to follow”, bullying (mostly from lecturers), disrespect, lack of empathy and humanity, failure to reconcile social life with academic, financial problems. Other studies highlight the following predisposing factors for suicide: chronic stress, previous suicide attempts, depression, high levels of anxiety,

broken relationships with a loved one, hopelessness, loss of something valuable, grades, high academic load, low economic status, sleep disorders, often experiencing headaches or non-inflammatory joint pain, living alone, poor physical health, receiving previous psychopharmacological treatment, alcohol use, lack of intrinsic motivation to study [3,7–9,12,16,18]. Comparing the results of our study with the results of other countries, we can clearly see that LUHS medical students experience a lot of negative factors in communication with the academic staff and other students: “cold, cynical, competitive relations among students”, does not allow for growth, sets rules to follow”, bullying (mostly from teachers), disrespect, lack of

Table 6. Medical students’ thoughts / intentions / suicide attempts in other parts of the world

Research	Country	Sample	Prevalence of thoughts/intentions/suicide attempts
Amiri and co-authors (2012) [14]	UAE	115 medical students in I–VI grades	17.5% have had suicidal thoughts. 1.8% had suicidal thoughts during the survey. 1.8% have attempted suicide.
Miletic and co-authors (2014) [15]	Serbia	1296 medical students in I,III,VI grades	2.9% have had suicidal thoughts. 0.5% had a suicide plan. 0.6% have attempted suicide.
Coentre and co-authors (2016) [16]	Portugal	465 medical students in IV–V grades	3.7% of the respondents had suicidal thoughts during their studies. 1.1% had a suicide plan in their studies. 0.7% of those surveyed attempted suicide during their studies.
Sun and co-authors (2017) [17]	China	2198 medical students in I–V grades	17.9% have had suicidal thoughts. 8.2% had suicidal ideation within 12 months. 5.2% had a suicide plan. 4.3% have attempted suicide.
Torres and co-authors (2017) [6]	Brazil	475 medical students in I–VI grades	7.2% had suicidal thoughts during the survey.

empathy and humanity. All of these potential causes of suicide are not highlighted in research findings in other countries and require the attention of students and academic staff alike to reduce medical students' thoughts/intentions/suicide attempts at the Lithuanian University of Health Sciences.

In our study, 8.1% of students had a mental disorder (depression, anxiety disorder, bulimia, schizophrenia), and 6.5% had a history of it. 4.7% used psychotropic medications during the survey, 9.9% had used medications earlier. In a study of 456 fourth- and fifth-year medical students at the University of Portugal, Coentre and colleagues in Portugal found that 12.7% of those surveyed had a psychiatric diagnosis and 11% had received prior psychopharmacological treatment [16]. Comparing medical students at the Lithuanian University of Health Sciences with Portuguese university colleagues, it is clear that LUHS medical students were slightly more likely to have mental illness and were 3.6% more likely to use psychotropic medication than their Portuguese counterparts.

Even 88.8% of LUHS I-VI medical students consumed alcohol less frequently or more frequently (the mean of the AUDIT-C test score was  $5.75 \pm 2.113$  at 0–4 for males and 0–3 for females). These data reveal that LUHS medical students have a high risk of alcohol abuse. In 2016, the same Master's student Erika Keršytė made similar conclusions in her Master's thesis. She claimed that most LUHS medical students consume alcohol. Almost half of students drink alcohol at least once a month. More than half of students consume 2 to 5 units of alcohol once. 6 units of alcohol and more are consumed more often by 4–6 year students. Girls are more likely to consume 1 unit of alcohol, guys 6 units and more [12]. Risky drinking is also common among medical students in Portugal: 11.8% suspected alcoholism, 15.6% alert alcoholism [16]. Alcohol consumption is a known risk factor for suicide. Alcohol consumption increases aggressiveness, impulsivity, which are strongly associated with suicidal behavior [19].

In our study, 3.1% of respondents used drugs during the survey. A study conducted by Coentre and colleagues in Portugal found that as many as 143 (31%) respondents mentioned using a substance over a 12-month period: cannabis, sedatives, stimulants, cocaine, heroin [16]. In Nepal, Adhikari and colleagues also analyzed medical students and found that 15 % of respondents used marijuana during their studies [20]. Comparing the results of this study with the studies of other authors, it can be stated that medical students of LUHS are much less likely to use drugs than medical students of other countries.

Men studying medicine at LUHS were more likely than women to have thoughts about suicide ( $p < 0.5$ ). This conclusion is in stark contrast to one of the findings of the Master's thesis presented by Erika Keršytė in 2016, which stated that no relationship between suicidal tendency and gender was found. [12]. It is noteworthy that gender differences in suicidal ideation have not been observed in other national studies [1,7,20]. Only a study by Zheng and colleagues found that of the 540 Chinese students surveyed, girls were more likely to commit suicide than boys [9]. The LUHS community needs to pay special attention to the population of male

medical students who had statistically significantly greater suicidal ideation and intention than girls.

No statistically significant differences were found in the prevalence of thoughts/intentions/suicide attempts and reasons among medical students of different rates in our study. A study by Coentre and colleagues in Portugal showed a similar trend: there is no difference in suicidal behavior between different medical courses [16]. Other authors have found different conclusions. In Erika Keršytė's Master's thesis, students who have been diagnosed with a mental disorder are more likely to commit suicide [12]. A study by Alhikari and colleagues found that students in clinical years in Nepal (from the third year of study) were more likely to have suicidal thoughts than pre-clinical students [20]. A similar trend was observed in China: medical students in their fourth year of study had the highest incidence of suicide [9].

Ideas for future research: it would be useful to compare the prevalence of thoughts/intentions/suicide attempts of LUHS medical students with those of Vilnius University medical students or with non-medical students of other universities.; at the same time- to evaluate the prevalence of mental disorders among medical students.

### CONCLUSIONS

1 About half of medical students in this study reported history of suicidal thoughts; 2.8% of the respondents had such thoughts during the survey. Every sixth of the respondents reported suicide plans. 1.2% of medical students had such intentions during the survey. 6.2% of the respondents have tried to commit a suicide.

2. According to medical students, the most common causes of suicidal ideations during study years are very different: stress, psychological pressure, high workload, competition, fatigue and burnout, personal life problems, lack of leisure time, bullying, high expectations of self / others.

3. Men more often than girls had suicidal thoughts and intentions, without significant differences in the prevalence of thoughts / intentions / suicide attempts and the reasons in differences causes of medical students.

### PRACTICAL RECOMMENDATIONS

The results of this study lead to much more needs of attention from the university community and efforts to reduce suicidal thoughts among medical students.

Further research is needed to elucidate the more accurate causes of suicide among LUHS medical students in I–VI courses and the most effective ways to reduce suicide rates.

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## Toma Garbenyte-Apolinskiene – The relationship between lower extremities sport injuries and functional indicators of the musculoskeletal system in high level female basketball players



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### INTRODUCTION

The popularity of basketball is on the rise, with an estimated 11% of the world's population (450 million people) currently playing basketball in 213 countries affiliated with the International Basketball Federation. Not only is the popularity of basketball increasing, but also the intensity with which it is played. The physiological demands of the sport include elevated aerobic and anaerobic capacities in addition to the integration of physical characteristics such as muscle strength, power, endurance, flexibility, speed, agility, and skill. Frequent jumping, landing and changes of direction make up much of the physical load of competitive games, with players exposed to high levels of eccentric loading.

Playing any sport comes with a considerable probability of injury for elite athletes and basketball players in particular, both amateur and professional, are at high risk. In terms of the various body part groups (e.g. head and waist, upper extremities or lower extremities), much of the literature addressing basketball injuries mentions the lower extremities as the most likely to be injured. The highest incidence is seen in adolescents, and the incidence is 3–5 times higher in female than male athletes. Studies of professional female basketball players in the United States have shown that they sustain 60% more injuries. The dangers and risks associated with playing basketball may result not only in serious injury, but may also seriously impair athletes' ability to earn a living or to engage in other professional, social and recreational activities, and impact their overall quality of life in general. A key component of athletic preparation is pre-season musculoskeletal screening and testing. The National Athletic Trainers' Association highlights musculoskeletal injury as a common cause of reduced sports activities (i.e., a loss of training and game time). Some authors claim that Functional Movement Screen tests (FMS), the Y Balance test for the lower quarter (YBT-LQ) and the Landing Error Scoring System for the jump-landing task (LESS) are popular in-the-field sport medicine screening tools, all able to identify players at risk of injury. Each of these assessments makes it easy to identify inefficient and/or compensatory movement tendencies, useful at the end of rehabilitation to determine an athlete's readiness to play sports again. Screening is of interest to injury researchers, physical therapists/ coaches, strength and conditioning specialists and sports medicine practitioners.

### AIM

To identify the relationship between lower extremities sport injuries and functional indicators of the musculoskeletal system in high-level female basketball players.

### OBJECTIVES

1) To determine the prevalence and localizations of lower limb sports injuries in high-level female basketball players. 2) To evaluate the influence of health problems on musculoskeletal system indicators and to assess their changes during the study period of high-level female basketball players. 3) To determine and compare the pre-seasonal fatigue level, the average weekly training time, the functional indicators of the musculoskeletal system and their correlation with lower limbs sports injuries. 4) To create an algorithm model for prediction of lower extremity sports injuries of high-level female basketball players and to identify the most significant indicators of risk assessment of sports injuries.

### CONCLUSIONS

1. During the four-year period 36.7% of elite basketball players were found to have suffered from lower limb musculoskeletal injuries. The most commonly encountered sports injuries were in knee (53%) and ankle (31%) areas.

2. It was found, that pre-study health problems did not influence the functional movement's quality, dynamic stability and jump landing biomechanics indices and during study period they unchanged.

3. For the high-level female basketball players who had no sport injuries the preseason fatigue was lower and the quality of the functional movement and the jump-landing biomechanics were greater.

4. Creating and applying a lower extremity sports injury prediction algorithm model has found that the most significant indicators of the risk of sports injury are the quality of functional movements and the dynamic stability. Creation and application of the lower extremity sports injury prediction algorithm allowed determining that functional movement quality and dynamic balance were the most important risk indices of trauma.