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SPIS TREŚCI • CONTENTS

• F I N A N S E I P R A W O F I N A N S O W E •
• Journal of Finance and Financial Law •
Numer specjalny/Special Issue 1/2023: 7–8

PREFACE

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In the hands of the readers, we present the first special issue of the "Journal of Finance and Financial Law", whose leading theme is the economics of healthcare systems. Readers will find five articles devoted to current problems in healthcare economics. The articles published in this issue focus on areas related to the challenges in the delivery and financing of the healthcare sector.

This issue opens with an article on the calculation and assessment of the costs of absence due to employee sickness in Europe. The authors of the text, Katarzyna Miszczyńska, Elżbieta Antczak, and Valentina Prevolnik Rupel, have estimated and subsequently assessed absenteeism among working-age people. This study demonstrated that there is variation in the cost of sickness absence across European countries, although no clustering relationship was identified from a geographic perspective.

The authors of the next article will focus on the development of the concept of financial literacy. The study presented in this article, based on bibliometric analysis, covers the period from 1991 to 2023, and the tool used to conduct the analysis, the VOSviewer package program, is impressive in its scope and capabilities. This allows for the detection of many interesting and worthwhile connections between the articles analysed in the database.

The third article in this special issue is devoted to a comparison of the healthcare models in Poland and Italy. Although the systems in Poland and Italy have been transformed in a completely different way, Bartłomiej Krzeczewski and Cesare Hassan have identified similarities between them and pointed out solutions that both countries could use to improve the efficiency of their operations.

The article, titled "Next Pandemic? Yes, Please! How the COVID-19 Pandemic Improved the Financial Condition of Polish Hospitals," examines the financial situation of hospitals during the pandemic. The authors, Agnieszka Bem,

Pawel Prędkiewicz, Rafał Siedlecki, Paulina Ucieklak-Jeż, and Jan Žukovskis, reach some seemingly controversial conclusions in their article, asserting that due to the special rules and financing, combined with underperformance, the financial condition of Polish hospitals has slightly improved.

The final article discusses the topic of health education among the students. Katarzyna Hampel, Agnieszka Bem, Paulina Ucieklak-Jeż and Zuzana Hajduova examine the influence of health education on students' attitudes towards caring for their own health, the health of others, and creating a healthy environment. The authors reached significant conclusions that emphasise the importance of implementing health education in schools to increase students' awareness and motivation to engage in activities that promote and maintain good health. These conclusions are of paramount importance from the perspectives of health, social, and educational roles, and the impact of education on society.

Katarzyna Miszczyńska
Guest Editor

• F I N A N S E I P R A W O F I N A N S O W E •
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ESTIMATING THE SHARE OF SICKNESS ABSENCE COSTS IN EUROPE'S GDP – A COUNTRY, GENDER AND TIME PERSPECTIVE

Katarzyna M. Miszczyńska[*], **Elżbieta Antczak**[**], **Valentina Prevolnik Rupel**[***]

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ESTIMATING THE SHARE OF SICKNESS ABSENCE COSTS IN EUROPE'S GDP – A COUNTRY, GENDER AND TIME PERSPECTIVE

ABSTRACT

The purpose of the article. The aim of the study was to calculate and evaluate the costs of employee sickness absence in European countries over the period 2006–2020. An additional objective was to analyse the sensitivity of the development of absenteeism costs depending on the changing level of the discount rate used in economic evaluation analyses.

Methodology. The estimation and subsequent assessment of absenteeism of working-age people costs was based on human-capital approach and was carried out retrospectively using the morbidity, top-down approach, based on aggregated epidemiological data. As a measure of production loss volume, GDP per working person was adopted.

Results of the research. The study indicated that there is variation in the cost of sickness absence across European countries, but no clustering relationship was identified from a geographic perspective. In addition, SACS is in the range of 1,9% – 2,1% in all countries in 2006 prices.

Keywords: cost-of-illness studies, indirect costs of illness, absenteeism, human capital approach.

JEL Class: H51, E60, I18, J16, C01.

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INTRODUCTION

Absence from work due to an employee's illness – sickness absenteeism – is an extremely complex and multidimensional phenomenon that affects not only the functioning of the workplace but also the economy as a whole. Literature studies point to multifaceted factors determining the occurrence of absenteeism (Antczak and Miszczyńska, 2021). Moreover, it has a real impact on the functioning of the economy and can be measured using a number of direct health care cost measurement methods, including the human capital approach, the friction cost approach and the willingness-to-pay method. All of these methods quantify the value of lost GDP lost. In addition to the value of GDP per worker itself, it is influenced by the value of the discount rate, which is applied at different levels in different European countries. Therefore, the aim of this article was to estimate and assess the evolution of the cost of employee sickness absence using the human capital approach and to analyse the sensitivity of the value of the share of unproduced GDP due to absenteeism in total GDP depending on the value of the discount rate adopted. The study will be conducted over the period 2006–2020 with a gender perspective.

1. COST OF ILLNESS ESTIMATION METHODS

An aspect that provides a starting point for research related to morbidity and its impact on the economy is sickness absence. Health, which together with education creates human capital, is simultaneously a key factor that determines economic growth (Acemoglu and Johnson, 2007). According to the human capital theory, created by the Nobel Prize winner G. S. Becker (Schultz, 1961), human capital is used to generate GDP. At the same time, sickness absence, which is the immanent result of a disease (Kujawska, 2015), directly leads to under-utilization of the individual's capital. This leads to decreasing productivity and creation of non-produced GDP. Health, being an essential component of human capital, supports the workers' productivity by enhancing physical capacity and mental capabilities (Bloom et al., 2022). Thus, the disease causes a reduction in work resources and limited productivity. It may also result in disabilities or premature death. This leads to two types of consequences. Firstly, household incomes of the sick and their informal caregivers are decreasing. Secondly, enterprises employ less than one factor of production in the short term, which leads to other factors not being utilised, and above all capital. As a result, the company's production volume decreases. Of course, replacements and hiring new employees, if possible, over time lead to the initial production volume. It does not change the fact that the production that would have been made by the sick, in the case they had not got sick, remains unprocessed. Thus it represents a loss that serves as a means of

measuring the cost of the disease for the economy and society (Nojszewska, 2016).

Many of the studies that link morbidity to economy-level growth factors focus just on cost measurement, which includes the dollar value of the cost of a certain diseases (Javaid et al., 2008). The identification and measurement of the cost of disease is done through cost-of-illness (COI) studies. COI methods analyze all costs associated with the occurrence of a diseases and provide information on the economic burden of disease from three different perspectives: society, the public payer, and the individual (Brodszky et al., 2019). As Drummond et al. (2005) emphasises, they not only support the understanding of the health problem, but above all provide the cost estimates necessary for economic evaluations by providing the structure and the main cost components. These costs are divided into three basic categories: indirect, direct and intangible costs (Łyszczarz and Nojszewska, 2017). Indirect costs are costs created due to absenteeism, presenteeism, premature death, incapacity to work, absenteeism of informal caregivers and the presenteeism of informal caregivers. Zemedikun et al. (2021) underlines that the cost approach involves not only the mere allocation and estimation of costs in the three groups mentioned, but also considering them from the perspective of the entity bearing the cost (societal, health system, industry, individual perspective). Obviously, depending on the type of entity, the categories of costs included in the estimates will vary. However, COI studies are carried out from the point of view of different approaches and perspectives and are not limited to the cost-based view only. From epidemiological point of view, COI studies can be done through prevalence-based or incidence-based approach. They are defined respectively as estimating costs for all existing cases in a given period or as assessing only the number of new cases in a given period (Zemedikun et al., 2021). COI can be done retrospectively (analysis of previously collected data) or prospectively (data are collected during patient follow-up). Prevalence and incidence-base COI studies can be conducted in both a prospective and retrospective manner (Tarricone, 2006). When conducting a COI study, it is also necessary to decide on one of three approaches: top-down, bottom-up or econometric (Jo, 2014).

The problem of estimating economic losses (in other words lost GDP) caused by the disease is widely discussed both in the context of its determinants and the connection with human capital (Nicholas et al., 2019). The human capital approach – HCA is, apart from the friction costs approach – FCA and willingness-to-pay method – WTP (Jo, 2014), the most important method of estimating the costs of lost GDP. Other methods include (Soekhai et al., 2019): health status assessment, Washington panel approach, contingent valuation method, or choice experiment. In practice, however, the first two methods are most commonly used.

2. AN OVERVIEW OF EUROPEAN PATTERNS IN LOST PRODUCTIVITY ESTIMATION METHODS

Many researchers involved in estimating the costs of diseases emphasize the validity of using such calculations from the point of view of guiding national health policy. In the perspective of health policy making, the analysis of productivity losses due to illness plays a very important role. These costs can be defined as "costs associated with loss of production and replacement costs due to illness, incapacity (temporary or permanent) and premature death" (Krol et al., 2013). The most commonly analysed costs are direct medical costs. However, Puddu et al. (2016), Pederzoli and Gandini (2008) reiterate in their research that the assessment of costs, including indirect costs, not only effectively drives health policy planning, but also contributes to the efficient allocation of resources (Koopmanschap et al., 1995). However, in European countries, but not only, there are no rigid, common guidelines concerning the use of specific methods of cost estimation. The choice as to the method used for estimating health economic costs, such as the direct, indirect or intangible costs of illness, is very often dictated by government recommendations. These recommendations relate not only to the method itself, but also to the perspective applied to their calculation. Country's recommendations also differ as to the categories of costs taken into consideration. Table 1 presents the details in question.

Table 1. Country-specific cost estimation

Country	Perspective on costs
Austria	To be justified during research (Health care payer/Societal/SHI).
Belgium	Health care payers
Bulgaria	No guidlines avaliable
Czech Republic	Health care payers
Croatia	Public payer (according to the Croatian Institute for Health Insurance)
Cyprus	No guidlines avaliable
Denmark	Socio-economic
England	The NHS and personal social services
Greece	No guidlines avaliable
Finland	Societal

Estonia	Health care
	Additionally societal
Latvia	Health care
	Additionally societal
Lithuania	Health care
	Additionally societal
France	Collective perspective. All the resources used
Malta	No guidlines avaliable
Luxembourg	No guidlines avaliable
Germany	Social Health Insurance (SHI) insurant primarily
Hungary	n/a
Ireland	Public health care and social care system
Italy	Health care
Netherlands	Societal
Norway	Societal
Poland	Public health care payer and/or the patient.
Portugal	Societal
Romania	No guidlines avaliable
Slovak Republic	Health care payers
Spain	NHS + societal perspective
	Societal +OSTEBA
	CATSALUT + societal perspective
Slovenia	Health insurance but societal perspective is also approved
Sweden	Societal
Switzerland	Health care

Source: own elaboration based on SBU (2015).

Most countries recommend the use a societal perspective when assessing productivity loss due to employee illness. In the majority of countries, the costs that are recommended for economic analyses are direct costs, in particular, direct medical costs. In some cases, a deeper analysis based on direct non-medical costs,

or indirect and intangible costs, is also acceptable. Interestingly, however, despite the use of a social perspective being indicated in country-specific guidelines, it is not fully specified how and through which cost categories lost productivity should be estimated. This is very evident in the differences in the cost categories captured. In some countries, despite the recommended social perspective, only direct costs are analysed (e.g. Norway), while in Portugal both indirect and direct costs are already included. The methods most commonly used for this assessment of lost productivity are: HCA, FCA and WTP. However, it should be emphasised that the first two methods (HCA and FCA) are the dominant approaches in indirect cost analysis (Neubauer et al., 2006). Table 2 presents details in question.

Table 2. 'Default' method of lost productivity measurement

Country	HCA	FCA	WTP	Other method	Type of the healthcare system
Austria	X	X			Universal Health Insurance - traditionally shaped systems
Belgium	X	X			
France	X	X			
Germany	X	X (in sensitivity analysis)			
Luxembourg	No guidlines avaliable				
Netherlands		X			
Switzerland				X	
Finland				X	National Healthcare - traditionally shaped systems
England	X				
Ireland				X	
Bulgaria	No guidlines avaliable				Universal Health Insurance - transformed systems
Czech Republic	X				
Croatia	X				
Estonia	X				
Hungary	X	X (for sensitivity analysis)			
Lithuania	X				

Poland	X	X (for sensitivity analysis)			
Slovak Republic	X				
Slovenia	X				
Romania	No guidlines avaliable				
Cyprus	No guidlines avaliable				National Healthcare - transformed systems
Denmark	X	X			
Latvia	X				
Greece	No guidlines avaliable				
Italy	X				
Malta	No guidlines avaliable				
Norway	X	X			
Portugal			X (CVM)		
Spain				X	
Sweden	X	X			

Source: own elaboration based on: Cleemput et al., 2015; Jiang et al., 2022; Lotrič Dolinar et al., 2020; Lublóy, 2019.

The choice of the most appropriate approach for valuing productivity loss has been the subject of much discussion in the literature (Bloom et al., 2022; Rodríguez-Sánchez et al., 2022; Zemedikun et al., 2021). The analyses were carried out in specific geographical areas or even countries but mostly based on specific diseases rather than disease groups. A study on the analysis of the methods used in chosen group of countries was carried out by the Mennini and Giotto (2022). They investigated the frequency of use of HCA and FCA methods in European countries. The authors found out that HCA-based analyses are most common in European countries, the only exception were the Netherlands, where FCA is more commonly used. The literature also raises the issue that the HCA and FCA methods used give different final values. Researchers argue that, as one method overestimates and the other underestimates the results in some way, it would be best to carry out each analysis in two ways and complement it with a sensitivity analysis.

3. DATA AND METHOD

3.1. Data

To analyze the share of costs of sickness absence (abbr. SACS) in Gross Domestic Product (GDP), the authors used data from the WHO (World Health Organization), OECD (Organization for Economic Co-operation and Development), National Central Banks and WB (World Bank). From the OECD, the authors obtained data for the size of employment in thousands of people: total and separately for men and women (OECD, 2023). The authors downloaded data on days of absenteeism from work due to illness from the WHO, i.e., the European Health for All database (World Health Organization, 2022). In turn, we obtained the number of working days (Monday to Friday) excluding public holidays (1990–2020 or 1995–2020) from the Working Group on General Economic Statistics National Central Banks (European Comm, 2022). The values for GDP expressed in current international dollars, converted by purchasing power parity (PPP) conversion factor were retrieved from the International Comparison Program, World Bank (World Bank, 2023). The calculation and analysis was carried out on data representing a consistent and comparable (spatial and temporal) set of information, i.e. for 14 time periods (the years from 2006 to 2020) and 25 European countries: Austria (AT), Belgium (BE), Croatia (HR), Czechia (CZ), Denmark (DK), Estonia (EE), Finland (FI), France (FR), Germany (DE), Greece (GR), Hungary (HU), Italy (IT), Latvia (LV), Lithuania (LT), Luxembourg (LU), Netherlands (NL), Norway (NO), Poland (PL), Portugal (PT), Romania (RO), Slovak Republic (SK), Slovenia (SI), Spain (ES), Sweden (SE), United Kingdom (UK).

The authors obtained data for discount rates and information for sensitivity analysis from health economic evaluation guidelines of countries in question. Table 3 presents discount rates and sensitivity analysis recommendations. All data used in the study are open access.

Table 3. Discount rates and sensitivity analysis recommendations (2006–2020)

Country	Discount rate value	Sensitivity analysis	
		Lower bound	Upper bound
Austria	0,03	0	0,05
Belgium	0,03	0	0,05
Croatia	0,05	0	0,1
Czechia	0,03	0	0,05
Denmark	-	-	-

Estonia	0,05	-	-
Finland	0,03	-	-
France	0,04	0,03	0,06
Germany	0,03	0	0,1
Greece	-	-	-
Hungary	0,037	-	-
Italy	0,03	0	0,05
Latvia	0,05	-	-
Lithuania	0,05	-	-
Luxembourg	-	-	-
Netherlands	0,04	-	-
Norway	0,04	-	-
Poland	0,05	0	0
Portugal	0,05	-	-
Romania	-	-	-
Slovak Republic	0,05	-	-
Slovenia	0,03	0	0,08
Spain	0,03	0	0,05
Sweden	0,03	0	0,05
United Kingdom	0,035	0,02	0,02

Source: own elaboration based on Williams et al. (2023).

3.2. Method

The estimation and subsequent assessment of morbidity costs was based on the cost-of-illness method (Jo, 2014; Nojszewska, 2016). The analysis was carried out retrospectively using the morbidity, top-down approach, based on aggregated epidemiological data (Jo, 2014). The authors analysed costs of absenteeism of patients. The costs of absenteeism of informal caregivers were not taken into account. In addition, indirect costs were estimated on the basis of data concerning patients according to their place of living.

The method of human capital was used to determine indirect costs. This method assumes that a disease makes it impossible to use the potential inherent in the human capital of sick people, which results in a decrease in productivity due to absenteeism, presenteeism, premature death, incapacity to work, absenteeism

of informal caregivers and the presenteeism of informal caregivers. However, this study was based only on absenteeism of patients.

As a measure of production loss volume, GDP per working person was adopted (GDP_{wp}). This measure allows for the use of two factors of production (labour and capital) in the production function, which corresponds to the analysis of the production volume in the economy and the analysis of economic growth. Moreover, it also takes into account the fact that work is not the only production factor, and the employee's illness and absenteeism may prevent the activation of other complementary production factors (Ernst&Young, 2013). In other words, a measure of GDP per one of the working person takes into account the lost productivity not only of the work itself, but also of other factors (e.g. a machine that is not used during the employee's illness to the same extent as when the employee is healthy) (Ernst&Young, 2013). The use of productivity measures in estimating indirect costs takes into account the decreasing marginal labour productivity. The is why, the value of 0,65 was adopted here in accordance with the position presented by the European Commission for EU-15 countries over the period of 1960 to 2003 (Nojszewska, 2016). Thus, the application of the productivity measure without taking into account the adjustment related to the decreasing labour productivity would inflate indirect costs (Nojszewska, 2016). Therefore all the estimated categories of indirect costs will be calculated on the basis of the modified *productivity unit* (PU) calculated according to the formula:

$$PU = GDP_{wp} * 0,65$$

In addition, indirect costs must be discounted with a nationally determined interest rate in line with national regulations concerning health technology assessment. The value of lost production is discounted, which applies to the periods following the year in which the event causing the loss of productivity occurred, and concerns costs related to premature deaths and inability to work for more than one year (Nojszewska, 2016). The costs of absenteeism of patients was determined on the basis of the number of days per year of absence from work due to sickness and confronted with productivity unit and discounted according to discount rates for economic evaluations.

Spatiotemporal analysis of SACS in GDP in European Countries over time from 2006 to 2020 was carried out using basic statistical measures, average rate of change (World Bank, 2022) and global Moran's I statistics (Anselin and Florax, 1995). Differences between the costs of men and women were verified using the Mann-Whitney U test (Nachar, 2008). The classification of countries was carried out on the basis of quartiles, i.e., the fourth class boundaries (with the lowest costs) were determined by the minimum and the first quartile, the third were determined by the first quartile and the median, the second were determined by the median and the third quartile, and finally the first were determined by the third quartile

and the maximum (Kukuła and Bogocz, 2014). In the article, the authors used SPSS Statisctis v.20 and ArcMap v.10.8.2.

4. RESULTS AND DISCUSSION

In 2006, the Czech Republic (21,1), Sweden (19,0), Norway (17,2), Greece (16,5), Germany (13,3) and Belgium (13,3) had the highest sickness absenteeism in terms of days per worker, with the average for the countries analyzed being 11,9 days of absenteeism per worker. The lowest absenteeism rate characterized the UK (5,5), Portugal (7,8), Latvia (8,3) and France (8,4). In 2020, Germany (20,2), the Czech Republic (20,1), Slovakia (16,9), Norway (16,8), Sweden (15,6) and Poland (15,5) had the highest sickness absence rate. The average for the countries surveyed was higher than in 2006, at 12,6 days per worker. On average, from 2006 to 2020, Germany (17,3), Norway (16,7), the Czech Republic (16,1), Sweden (15,4), Greece (14,4), Poland (13,8) and Slovakia (13,4) had the highest sickness absence per employee. The average absenteeism for the years studied was 11,4 (Chart 1).

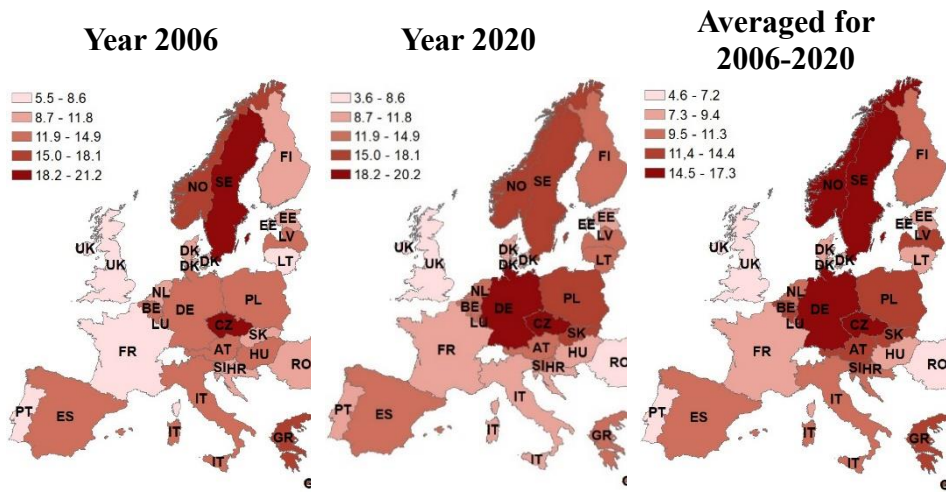

Chart 1. Absenteeism from work due to illness (days per employee per year)

Source: own elaboration based on World Health Organization (2022) in ArcMap 10.8.2.

Based on the statistics in Table 4, there is a higher share of sickness absence costs in women's GDP (M=3,3%) than in men's (M=2,7), also higher than the average level of the share of costs by 0,4 percentage points than on average in the

group of countries surveyed (M=2,9%). Moreover, the positive value of Kurtosis and the high values of the coefficient of variation (exceeding the all-encompassing value of 10%) indicate the differentiation of countries, i.e., the presence of areas with moderately high and low values of SACS in GDP (more extreme outliers than in a normal distribution) and significant differences in terms of the variable during the period under study. In turn, the value of the Moran's spatial statistic indicates a tendency for countries with similar cost values to cluster – this is particularly evident and statistically significant with regard to the share of female sickness absence costs (MI=0,36**).

Table 4. Descriptive statistics of share of sickness absence costs in GDP (averaged over years 2006–2020) [in %]

	Total	Males	Females
Mean (M)	2,9	2,7	3,3
Median (Me)	2,8	2,7	3,2
Standard Deviation (SD)	0,9	1,0	1,2
Skewness (S)	0,3	0,3	0,2
Kurtozis (K)	0,05	0,7	0,04
Minimum (Min)	1,2	0,7	1,0
Maximum (Max)	4,9	5,1	5,8
Coefficient of Variation (CV)	30,1	38,3	36,4
Morans'I (MI)	0,07*	-0,06	0,36**

Note: significance levels: α = 0.10*, 0.05**, 0.01***;

Source: own study.

Overall, the share of sickness absenteeism costs in GDP increased during the period analyzed (by an average of 0,02% from year to year between 2006 and 2021). In contrast, an average annual decrease in costs was observed for male absenteeism (by 0,3% from year to year). In contrast, for women, the cost of sickness absenteeism increased steadily (by 0,52% year on year), and the growth rate was 0,5 percentage points faster than for countries overall and 0,8 percentage points faster than for men. Nevertheless, fluctuations in the formation of the SACS were recorded during the period under study (Chart 2).

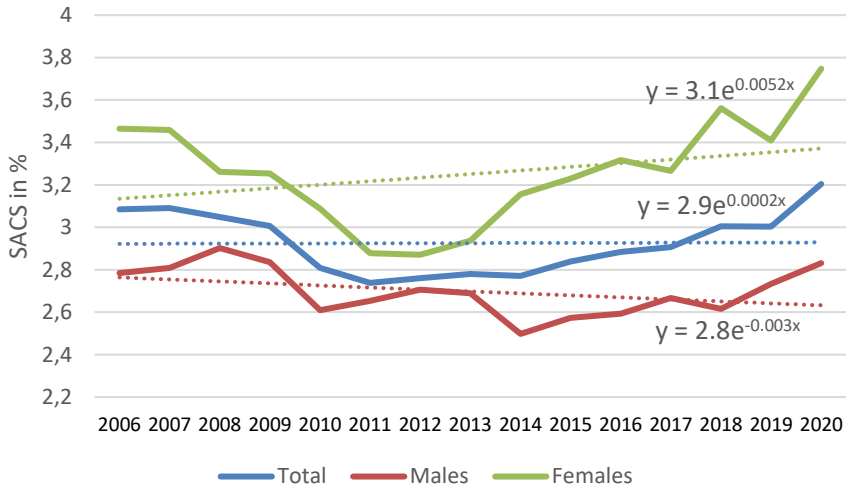

Chart 2. SACS in GDP in time span 2006–2020 (averaged over countries) [in %]

Source: own study based on a database in Table 1.

The analysis carried out shows that countries do group together, but separately for women and men. Thus, regional differences were observed from a time and gender perspective. It was also observed that inequalities in the magnitude of costs widened over the period analysed.

On average, Germany (4,5%), Norway (4,3%), the Czech Republic (4,2%), Sweden (4%), Greece (3,7%) and Poland (3,6%) had the highest absenteeism costs between 2006 and 2020. The lowest costs were incurred by the UK (1,2%), Romania (1,8%), Portugal (1,9%), France (2,2%), Denmark (2,2%), Estonia (2,4%) and Hungary (2,4%), as shown in Chart 3(c). During the period studied, significant differences were noted in the development of the level of costs depending not only on countries, but also on gender. The Mann-Whitney U test (MWU), which is used to compare differences between two independent groups when the dependent variable is either ordinal or continuous, but not normally distributed for males and females' SACS indicated significant differences in the amount of sickness absence costs incurred (MWU=216,0***). Thus, for males, the highest costs (on average over the entire study period) were recorded in Germany (4,9%), Greece (4,4%), Lithuania (3,6%), Estonia (3,5%), Norway (3,4%) and Austria (3,3%). For women, the highest cost of absenteeism as a share of GDP was in the Czech Republic (5,3%), Norway (5,2%), Sweden (5,1%), Poland (4,7%), Germany (4%) and Slovakia (3,9%). Moreover, important differences in the development of abortion costs were also noted between years, The difference in 2006 versus 2020 between the share of total costs in GDP was

statistically significant, MWU=222,0*. By gender, in 2006 the MWU test value was 200,0*, and in 2020 MWU=177,0***. A pattern of widening inequalities in the size of costs over time was observed. In 2006, the average share of absenteeism costs was 3,1%, and the highest SACS characterized the Czech Republic (5,5%), Sweden (4,9%), Norway (4,4%), Greece (4,3%), Germany (3,5%) and Belgium (3,4%). The lowest cost was observed in the UK (1,4%), Portugal (2,0%), France (2,2%), Latvia (2,2%), Romania (2,3%), Denmark (2,4%) and Luxembourg (2,5%). In the year in question, with respect to men, the average share of absenteeism costs stood at 2,8%, while with respect to women it was higher at 3,5%. This year, the highest SACS for men was characterized by Greece (4,6%), the Czech Republic (4,4%), Estonia (4,2%), Sweden (3,7%), Norway (3,5%) and Germany (3,4%). In the case of women, it was the Czech Republic (6,9%), Sweden (6,3%), Norway (5,3%), Hungary (4,4%), Italy (4,2%), and Poland (3,9%) that achieved the highest share of women's sickness absence costs in GDP. The lowest shares in 2006 were recorded by Romania (1,1%), UK (1,3%), Portugal (1,7%), and in the case of women were, for example: Estonia (1,2%), Latvia (1,5%) and also UK (1,6%), as shown in Chart 3(a). In contrast, in 2020, the average cost level was 3,2%, and the highest overall cost of absenteeism was observed in Germany (5,2%), the Czech Republic (5,2%), Slovakia (4,4%), Norway (4,3%), Sweden and Poland (4,0% each, respectively). In contrast, the lowest absenteeism costs were achieved by the UK (0,9%), Romania (1,7%), Denmark and Austria (2,3% each), France, Portugal and Hungary (2,4% each). For men, the average cost of absenteeism in 2020 was 2,8%, the highest achieved by Germany (5,1%), Latvia (4,8%), the Czech Republic (4,1%) and Slovakia (3,9%), among others. For women, it was the Czech Republic (6,6%), Germany (5,4%) Norway (5,2%) and Poland (5,0%), with an average of 3,7%. The lowest sickness absence costs for men in 2020 affected, among others, Romania and the UK (0,7% each), Denmark (1,8%), and Portugal and France (1,9% of GDP each). In the case of women's absenteeism, the lowest cost share in GDP this year was recorded by the UK (1,2%), Latvia (1,8%), Estonia (2,1%), Denmark (2,7%) and France (2,8%), as shown in Chart 3(b), among others.

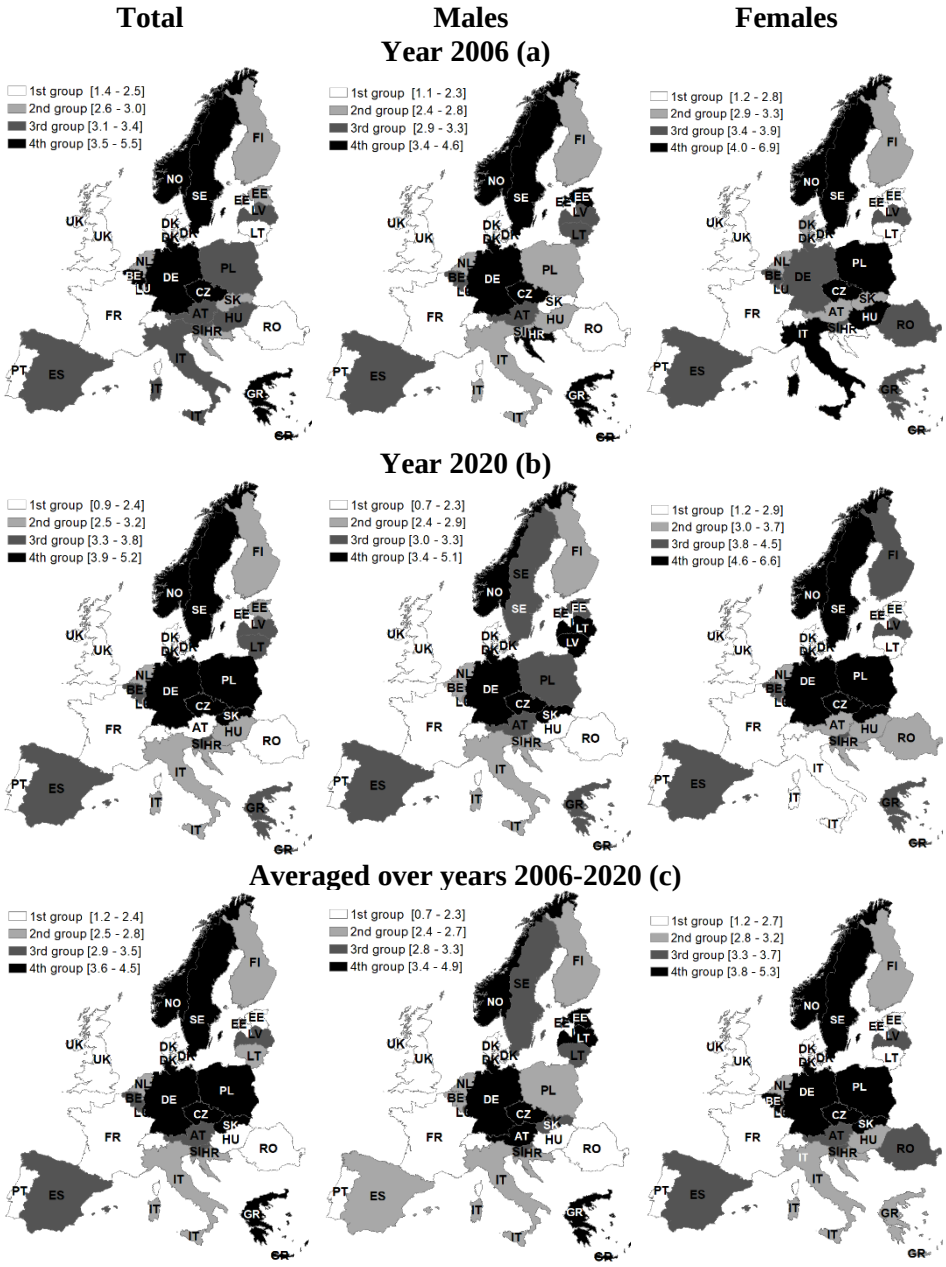

Chart 3. SACS in GDP in 2006, 2020 and averaged over years in European countries [in %]

Source: own elaboration in ArcMap 10.8.2.

During the period under study, the fastest annual growth in the share of absenteeism costs in GDP was recorded in Germany (by 2,9% per year), Latvia (2,5% year-on-year), Luxembourg (1,7% year-on-year), Portugal and Poland (by 1,3% respectively annually). The largest annual decrease in costs took place in Romania (by 3,1% from year), Austria (by 2,8% p,a,), Italy (by 2,6% p,a,), in Hungary (by 2,5% year on year) and in the UK (by 2,4% year on year). The rate of increase in women's cost share was significantly faster than the rate of increase in men's absenteeism costs (MWU=212,0**). The annual growth in the share of women's absenteeism costs took place in most of the countries analyzed. Female absenteeism costs grew fastest in Germany (by 6% year-on-year), Latvia (by 5% year-on-year), Estonia (by 3,5% year-on-year), Croatia (by 2,6% year-on-year) and Poland (by 1,8% year-on-year). The fastest growth in men's absenteeism costs was recorded in Luxembourg (by 1,9% year-on-year) and Germany (by 1,2% year-on-year). The fastest decline in male absenteeism costs was observed in Croatia (by 3,3% year-on-year), the UK (by 2,8% year-on-year) and in Estonia (by 2,6% year-on-year). In contrast, women's sickness absence costs fell sharply in Romania (by 3,2% year-on-year), Italy (by 3,0% year-on-year) and HU (by 2,9% year-on-year), as shown in Chart 4(a).

In 2020, relative to 2006, the largest increases in costs were in Slovakia (by 69%), Latvia (by 52%), Germany (by 51%), Luxembourg (by 27%) and Poland (by 25%). For men's absenteeism costs, the largest increases were in Latvia (up 70%), Slovakia (up 67%), Germany (up 49%), and Luxembourg (up 27%). In contrast, Estonia, Slovakia, Germany, Finland, Croatia and Poland showed the largest increases in women's sickness absence costs (from 28% in Poland to 85% in Estonia, in 2020 for 2006). The largest decreases in costs were observed in the UK (by 35%), Romania and Austria (by 28%) and Hungary (by 26%). Sickness absence costs for men fell significantly in the UK (by 43%), Romania (by 35%), and Croatia (by 29%), while for women, the largest declines were seen in Hungary (by 32%), Italy (by 31%) and the UK (by 29%), as shown in Chart 4(b).

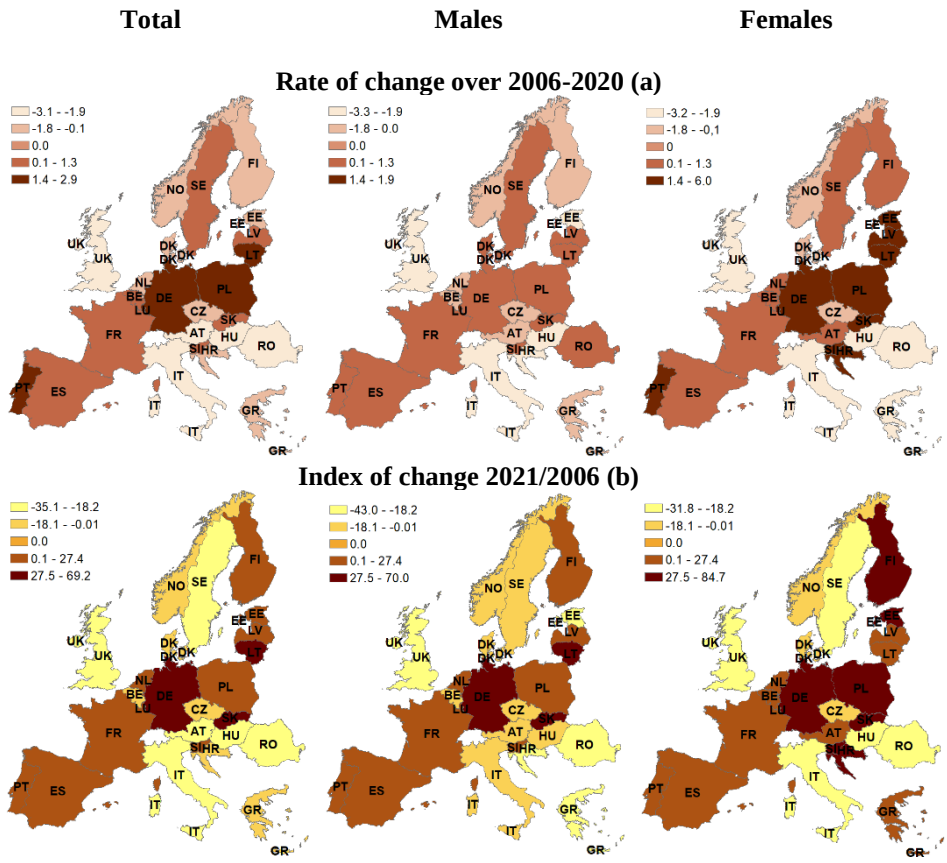

Chart 4. Rate of change (over years 2006–2020) and index of change (in 2021/2006) of SACS in GDP in European countries [in %]

Source: own elaboration in ArcMap 10.8.2.

Discount rate choices in determining health outcomes and costs have important implications for the results of economic evaluations of health interventions and policies. In global health, such evaluations typically use a discount rate of 3% for both health outcomes and costs (Haacker et al., 2020). Suggested values for discount rates vary in European countries and range from 3% – 5% and have important implications for the value of unearned (lost) GDP. The level of discount rates directly affects the value of lost GDP and it is worth noting that not all countries have chosen to introduce them when calculating both costs and benefits in health care. These countries include: Denmark, Greece, Luxembourg and Romania. It is also worth noting that not all countries have chosen to use sensitivity analyses in these analyses. In addition to the countries

just mentioned, this group also includes Slovakia, Portugal, Norway, the Netherlands, Lithuania, Latvia, Hungary, Estonia and Finland. In the remaining countries, the minimum and maximum values of discount rates used in the sensitivity analysis ranged from 0% to 10%. The impact of these figures on SACS is presented in Chart 5.

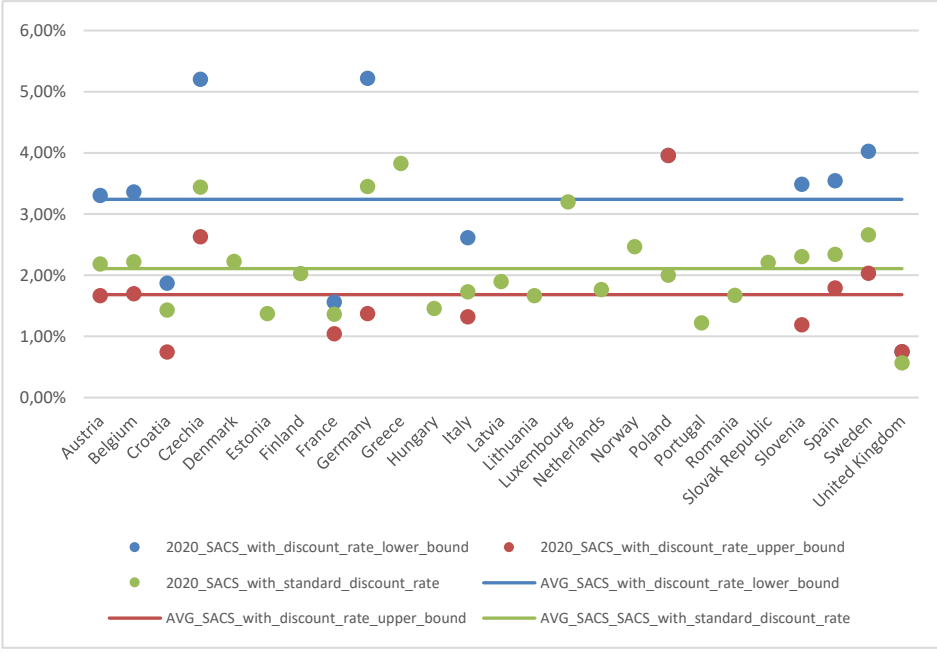

Chart 5. Sensitivity analysis of SACS depending on different discount rate level

Source: own elaboration.

CONCLUSIONS

The aim of the study was to estimate and assess the cost of sickness absence and its contribution to GDP in European countries. The study indicated that there is variation in the cost of sickness absence across European countries, but no clustering relationship was identified from a geographic perspective. In addition, SACS averages 1,68% – 3,24% across all countries in 2006 prices. By contrast, the analysis on an individual basis shows quite a wide variation in the SACS indicator, ranging from 0,57% of GDP in the UK, 1,36% of GDP in France to as much as, 3,8% in Greece. Conversely, a sensitivity analysis of the level of the SACS index to changes in the interest rate shows SACS fluctuations -0,5 p.p. in the upper bound to +1.5 p.p. in the lower bound. It is worth noting that not all

countries follow the recommendation to use sensitivity analysis when discounting costs and benefits in health care. Definitely standardising such guidelines would make it easier and, above all, more realistic to carry out comparative analyses in this respect between countries.

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DISCLOSURE STATEMENT

The authors report no conflicts of interest.

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BIBLIOMETRIC ANALYSIS OF STUDIES ON THE CONCEPT OF FINANCIAL LITERACY

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BIBLIOMETRIC ANALYSIS OF STUDIES ON THE CONCEPT OF FINANCIAL LITERACY

ABSTRACT

The purpose of the article. This paper attempts to reveal the effect of the study by visually presenting the analysis of the studies on the concept of "financial literacy".

Methodology. Bibliometric analysis of the studies published in the Web of Science (WOS) database between 1991 and 2023 was analyzed with the VOSviewer (Version 1.6.9) package program. Since the title, content, and keyword of the concept of "financial literacy" were intended to be scanned in all languages and all publication types, 2,889 works were accessed and analyzed. The limitations of the study are that only the studies in WOS are analyzed. No data from Scopus and PubMed databases has been included. For future studies, research from the Scopus and PubMed databases should be added.

Results of the research. When the most frequently included keywords in the publications related to the concept of "financial literacy" have a relationship between them at least twice in the study, the keywords "financial literacy" with 825 repetitions in terms of 1841 total connection strength, "financial education" with 111 repetitions in terms of 315 total connection strength, "financial behavior" with 65 repetitions in terms of 217 total connection strength and "financial knowledge" with 71 repetitions in terms of 213 total connection power are seen. As a result of the analysis performed, it was determined that there were 2265 connection powers and 4069 total connection powers for a total of 36 clusters. When we look at the year-by-year distribution, the most works were published in 2022 with a maximum of 426 works. At least one work was published in 2004,

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2003, 1998, 1994 and 1991. Among the published studies, journal article 2,515, proceedings paper 280, early access 135, book chapters 101, review article 68, editorial material 29, correction 6, book 5, book review 3 were determined as works. When we look at the languages in which the published works are published, they are in English with a maximum of 2,814 works. At least two works are in French and Chinese. In order to determine the year-based stratification status of the published studies for country-based citations, it was noted that a country should have at least 1 study published and at least 1 citation obtained. As a result of the analysis, analysis was carried out on 78 observation units that were found to have a relationship between them, and it was determined that there were 14 clusters, 1065 connection power and 9417 total connection power. The countries with the most citations are the USA (11981 citations), the Netherlands (2445 citations) and England (1685 citations). In terms of the number of works, the ranking is the USA (197 publications), China (77 publications), India (73 publications), and Australia (70 publications). When the stratification status of the citation ties of the countries on a yearly basis is examined, it is seen that they are limited between 2017 and 2021.

Keywords: financial literacy, business, financial behavior, financial knowledge.

JEL Class: A12, A13, D14, G40.

INTRODUCTION

Although this type of bibliometric analysis is used to examine the scientific productivity in a subject or research area, publication trends, the influence of authors and institutions, the citation of publications and similar characteristics, it is also used for many purposes such as evaluating academic research, identifying new research areas, and measuring the performance of researchers and institutions.

In this article, the connections and relationships between the studies subject to analysis will be discussed. The commonalities and differences of key concepts between the studies will be also analyzed, and how the related studies interact with each other on the basis of year-author-citation-institution-country will be emphasized.

In this study, since it is aimed at scanning the title, content and keyword of the concept of financial literacy in all languages and all publication types, the studies published in the Web of Science (WOS) database were examined by bibliometric analysis. This study is expected to be useful for businesses, policymakers, practitioners, the private sector, the public sector and academics working in the field in terms of revealing the place of financial literacy in the literature and identifying its gaps.

It is believed that by ensuring that the keywords in the most cited articles are noticed, the key words will be a guide for the researchers who will conduct research in this field in the future.

1. CONCEPTUAL FRAMEWORK

1.1. Some Concepts Associated with Financial Literacy

1.1.1. FINANCIAL LITERACY

Financial literacy refers to the knowledge and skills necessary to make informed financial decisions. Budgeting involves understanding various financial concepts such as saving, investing, and managing personal finances. Financial literacy is important because it empowers individuals to make sound financial choices, avoid common pitfalls, and achieve their financial goals. However, financial literacy practices refer to the actions and strategies that individuals or organizations implement to promote and improve financial literacy. These practices may vary depending on the target audience, context, and goals, but are generally aimed at improving financial knowledge, skills, and behaviors.

Today, it is observed that financial literacy knowledge is insufficient to make the types of financial decisions required in both enterprises and other institutions

and organizations. Financial literacy helps people make informed financial decisions. Thus, individuals can better understand and comprehend the information about the operation of insurance and basic financial instruments, and they can act more comfortably while using them. In short, financial literacy improves financial well-being in life (Lusardi and Messy, 2023). Low levels of financial literacy increase consumer and financial market risks as increasingly complex financial instruments enter the market (Klapper and Lusardi, 2019). Because women face unique financial challenges, they need financial knowledge to build a financially secure future (Hasler and Lusardi, 2017).

When evaluated in the context of educational business, it is known that financial literacy is not at the desired level among high school students and that the new generation of adults does not have enough information when they face obstacles and change. Within the framework of the latest wave of the OECD Programme for International Student Assessment (PISA), around 20 percent of students in some G7 countries, such as Italy, are not at the basic level of proficiency in financial literacy. In other countries, such as Peru or Brazil, the rate is over 40% (OECD, 2020; Lusardi and Messy, 2023).

According to Kaiser et al. (2022), financial education programs have, on average, positive causal treatment effects on financial knowledge and sub-financial behaviors. In short, the implementation of national strategies that promote financial literacy, the design of financial education policies and school instructions is a situation that requires urgency for policymakers worldwide (Kaiser et al., 2022).

Improving financial literacy can have a positive impact on individuals, families, and communities. Better financial well-being can lead to increased savings, reduced debt, and improved financial security. It can also help individuals navigate complex financial products and services, make informed decisions about borrowing and investing, and plan long-term financial goals such as retirement or education.

According to Lusardi (2015), there are four innovative aspects of financial literacy that need to be addressed. First, financial literacy does not depend solely on knowledge and understanding, but also aims to support effective decision-making. The latter is not intended to influence a single behavior, such as reducing debt by increasing savings, but also to improve financial well-being. Third, financial literacy has implications not only for individuals but also for society. Fourth, financial literacy enables young people to participate in economic life (Lusardi, 2015; Lusardi and Messy, 2023).

TIAA Institute-GFLEC Personal Finance Index (P-Fin Index), an annual assessment of financial literacy among the U.S. adult population, now in its sixth year (Yakoboski et al., 2022)[1].

The P-Fin Index survey also includes indicators of financial well-being, which allow the relationship between financial literacy and financial well-being to be examined (Yakoboski et al., 2022). In this context, comparative studies can be carried out by making a detailed analysis of country-based financial literacy information with the projects of different countries.

Financial literacy can be improved in a variety of ways, including through educational programs, workshops, online courses, and resources provided by financial institutions, government agencies, and nonprofits. These resources typically cover topics such as budgeting, saving, investing, debt management, credit scores, insurance, and retirement planning.

Recent research shows that people enter old age with more debt and little or no retirement plans (Mitchell and Lusardi, 2022). This process shows that many people are not financially prepared for retirement. Therefore, it is important for people to make retirement plans in order not to experience financial difficulties in the aging process. These plans may consist of different methods, such as saving, investing, or participating in retirement funds. Creating a retirement plan can also create a more promising future financially by helping people feel more secure in their old age. So by expanding their financial knowledge and skills, individuals can have more control over their financial lives and make informed decisions that align with their financial goals and values.

National strategies that promote financial literacy in businesses and the public need to be implemented, and financial education policies and school instructions need to be designed in this context. The impact of financial literacy programs, especially in the workplace on the participants of the program can help users with the ability to create a budget, learn how to rebuild savings, monitor their credit, manage debt, and use online technology to make financial decisions, for example (Lusardi et al., 2021).

1.1.2. FINANCIAL BEHAVIOR

Financial behavior refers to the way individuals manage their money, make financial decisions, and engage in financial activities. Budgeting encompasses a wide range of actions and choices related to personal finance, such as saving, investing, borrowing, and spending. According to a study by Dewi et al. (2020), it was aimed at determining the level of financial literacy of millennials and to

[1] The TIAA Institute-GFLEC Personal Finance Index (P-Fin Index) measures knowledge and understanding that enable sound financial decision making and effective management of personal finances among U.S. adults (GFLEC, 2023).

examine the relationship between their financial knowledge, financial attitudes, financial skills and financial behavior. As a result of the research, significant relationships were found not only between financial attitude and financial management behavior, but also between financial skills and financial management behavior. However, it was concluded that there was no significant relationship between financial information and financial behavior (Dewi et al., 2020).

Understanding financial behavior is important because it can have a significant impact on an individual's financial well-being and outcomes. Financial behavior can be influenced by a variety of factors, including personal attitudes and beliefs about money, financial knowledge and literacy, cultural and social influences as well as economic conditions.

In Australia, buy-and-pay now (BNPL) is a thriving payment innovation. Regulators and consumer groups have expressed concern about the financial risks posed by BNPL. Because BNPL is not regulated in the context of consumer credit law, financial regulators and consumer groups have recommended that BNPL users adopt many responsible financial behaviors for their financial well-being. Survey results of BNPL users show a link between many of the proposed financially responsible behaviors and financial well-being, and that the financial behavior of young users (under 25) puts them at serious risk of reduced financial well-being (Powell et al., 2023).

Research in the field of behavioral finance shows that individuals may not always be able to make rational and optimal financial decisions. Behavioral biases, emotions, and cognitive limitations can lead to irrational financial behaviors, such as excessive risk-taking, overspending, or poor investment choices. Korkmaz et al. (2021) investigated the relationship between risk preference and risk behavior using the Chinese Household Finance Survey (CHFS). The results showed that there was a discrepancy between risk preference and risky behavior; in addition, financial literacy affects this discrepancy. In other words, financial literacy increases risk-taking behavior while increasing inconsistency in risk-averse people and decreasing it in risk-seekers.

Improving financial behavior often involves developing financial literacy and skills, as well as addressing behavioral biases and emotions. Financial education and awareness programs can help individuals make better financial decisions by providing them with the information and tools to manage their money effectively.

Financial institutions and policymakers also play a role in shaping financial behavior by designing products and services that promote responsible financial behavior and by providing consumer protections and regulations.

1.1.3. FINANCIAL KNOWLEDGE

Financial knowledge refers to the understanding and awareness of various financial concepts, principles and practices. It includes information on topics such as budgeting, saving, investing, debt management, insurance, tax, and retirement planning. Having financial knowledge is important because it allows individuals to make informed decisions about their money and financial well-being. It helps individuals understand how to effectively manage their income, expenses, and assets. With financial knowledge, individuals can make better choices about saving for the future, investing wisely, and avoiding financial pitfalls.

The age of the knowledge economy, the importance of financial information services is obvious. The more developed the economy, the higher the need for the quality of financial information services. The quality of financial information services is based on financial information innovation, and financial information innovation should focus on the measures and contents of financial information services (Yuxia, 2010).

Meressa (2023) explored the relationship between entrepreneurial financial literacy, access to credit, and the sustainability of small businesses in Ethiopia. The study used cross-sectional data collected from 293 small business owners and managers through a survey in 2022. The results showed that entrepreneurial financial literacy benefits the sustainability of small businesses.

Skica et al. (2022) analyzed the relationship between financial knowledge and a new business entry. For this, the authors used data from the Global Entrepreneurship Monitor (GEM), specifically the Adult Population Survey (APS) Global National Level Data. The results show that financial literacy is significantly positively correlated with the proportion of total early-stage entrepreneurial activity within the technology sector and negatively correlated with business discontinuance due to problems in getting finance. Furthermore, it is significantly negatively correlated with early-stage entrepreneurial motives to build a high income and earn a living because jobs are scarce (i.e., necessity-driven entrepreneurship).

Financial knowledge can be gained through a variety of means, including formal education, self-study, workshops, online courses, and resources provided by financial institutions and organizations. It is important to constantly update and expand financial information to keep up with changing economic conditions, financial products and regulations.

Research has shown that individuals with higher levels of financial knowledge tend to make better financial decisions (Cwynar et al., 2020), have higher savings rates, and achieve greater financial security (Białowolski et al., 2022). Financial information can also help individuals protect themselves from

fraud, make informed choices about financial products and services, and effectively plan for long-term financial goals.

2. METHOD

2.1. Aim of the Research

The Web of Science (WOS) aims to conduct a bibliometric analysis of the title, content and keyword of the "financial literacy" title, content and keyword published in the range of 1991–2023 in all languages and all publication types, as well as in the finance and business categories. It will be visually presented in the context of conceptual relationships in the scientific literature, author, number of citations, country, institution and keyword analysis and will conduct studies on the subject in the future. It is widely believed that it will contribute to researchers' work.

2.2. Hypotheses of the Study

The analysis of studies on the concept of "financial literacy" through a bibliometric approach using the Web of Science (WOS) database between 1991 and 2023, as presented in this study, aims to provide a comprehensive visual representation of the evolving landscape in financial literacy research. Our study hypothesizes the following:

- H_1: It is assumed that the most commonly used keyword is "financial literacy".
- H_2: It is assumed that there is an increase in financial literacy publications in the context of temporal evolution.
- H_3: It is assumed that English-language journal articles predominate.
- H_4: The United States is assumed to have the highest number of citations.
- H_5: It is assumed that the citation links between the years show limited stratification.
- H_6: It is assumed that the call for the inclusion of Scopus and PubMed databases in future research will provide a more comprehensive understanding of financial literacy research.

2.3. Data and Analytics

In this study, thanks to the visual analysis features of recognizing new research in scientific fields, identifying gaps in the literature and creating a roadmap for future research was possible, the VOSviewer (Version 1.6.9) package program (Van Eck and Waltman, 2009; Yurdakul and Bozdoğan, 2022).

Since it is very important to select appropriate data sources in terms of reliability and quality of research, the WOS database was used in this study because it is a comprehensive database of scientific literature. The obtained data was evaluated in the context of author-citation number, country-institution and keyword analysis.

Table 1. Year-based distribution of published works

Year	Number of published works	Year	Number of published works	Year	Number of published works
2023	242	2013	73	2003	1
2022	426	2012	79	2002	2
2021	419	2011	50	2001	2
2020	389	2010	26	1999	2
2019	317	2009	28	1998	1
2018	224	2008	12	1997	2
2017	175	2007	7	1994	1
2016	154	2006	4	1991	1
2015	136	2005	5		
2014	110	2004	1		

Source: Authors' own elaboration.

Having analyzed the year-by-year distribution, it can be noted that the most works were published in 2022 with a maximum of 426 works. At least one work was published in 2004, 2003, 1998, 1994 and 1991.

3. FINDINGS

3.1. Co-authorship of Authors

In the context of the co-authorship analysis of the authors, the network map is presented in Figure 1, provided that at least one publication and at least one citation criteria are met in order to identify the most linked authors.

As a result of the analysis carried out among the authors with the most connections between them, it was found that there were 26 clusters and 321 connections and 488 total connection strengths. The most cited authors is Annamaria Lusardi with 6541 citations. The author has published 35 works and has a total link power of 56. It is followed by Olivia S. Mitchell with 3958 citations. The author has 34 published works and 37 total connection strengths. These two authors who have published the most studies are also the ones with the highest total connection power.

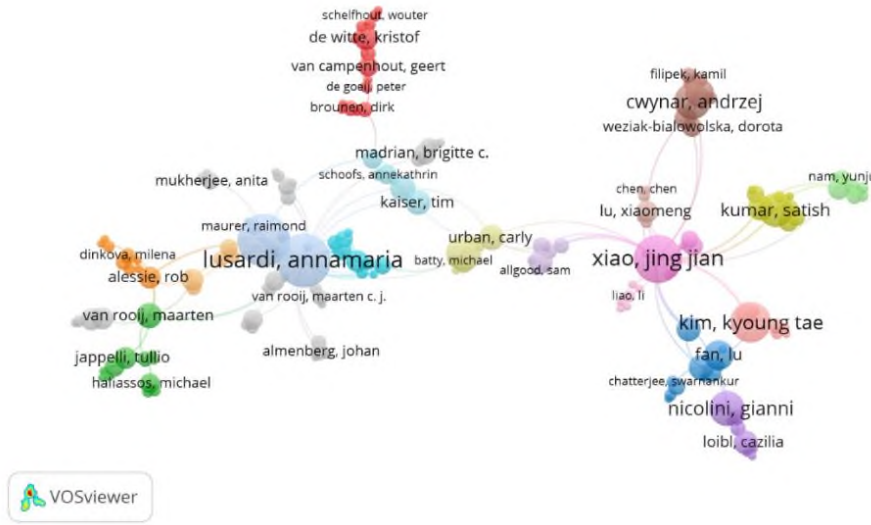

Figure 1. Co-Author Connects Demonstrating Collaboration Between

Source: Authors' own elaboration.

3.2. Citation of Authors

In order to determine the citation networks, at least one publication and at least one citation criterion were met in the context of author citation analysis, and a year-based stratification status was determined. As a result of the analysis, 1553 units were found to be connected; with 48 clusters, it was determined that there was a connection power of 26225 and a total connection power of 37379. The most cited authors is Annamaria Lusardi with 6541 citations. It is followed by Olivia S. Mitchell, with 3958 citations and Rob J. Alessie with 910 citations. These three most-cited authors are also the ones with the highest total link power. When the citation links of the authors are examined on a yearly basis, it is seen that they are limited between 2014 and 2022.

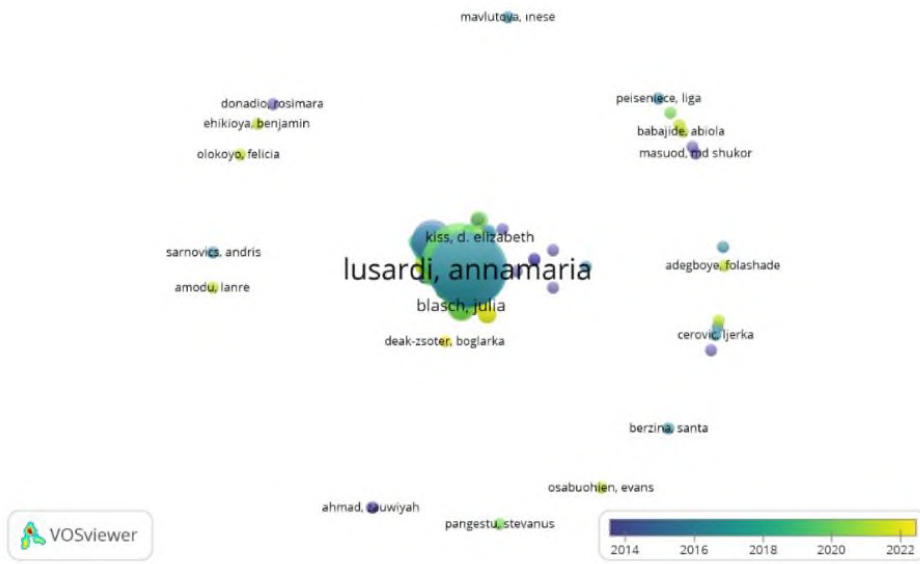

Figure 2. Status of authors' attribution links by year

Source: Authors' own elaboration.

3.3. Citation of Countries

In order to determine the year-based stratification status of the published studies for country-based citations, it was noted that a country should have at least one study published and at least one citation obtained. As a result of the analysis, it was carried out on 78 observation units that were found to have a relationship between them, and it was determined that there were 14 clusters, 1065 connection power and 9417 total connection power. The countries with the most citations are the USA (11981 citations), the Netherlands (2445 citations) and England (1685 citations). In terms of the number of works, the ranking is USA (197 publications), China (77 publications), India (73 publications), and Australia (70 publications). When the stratification status of the citation ties of the countries on a yearly basis is examined, it is seen that they are limited between 2017 and 2021.

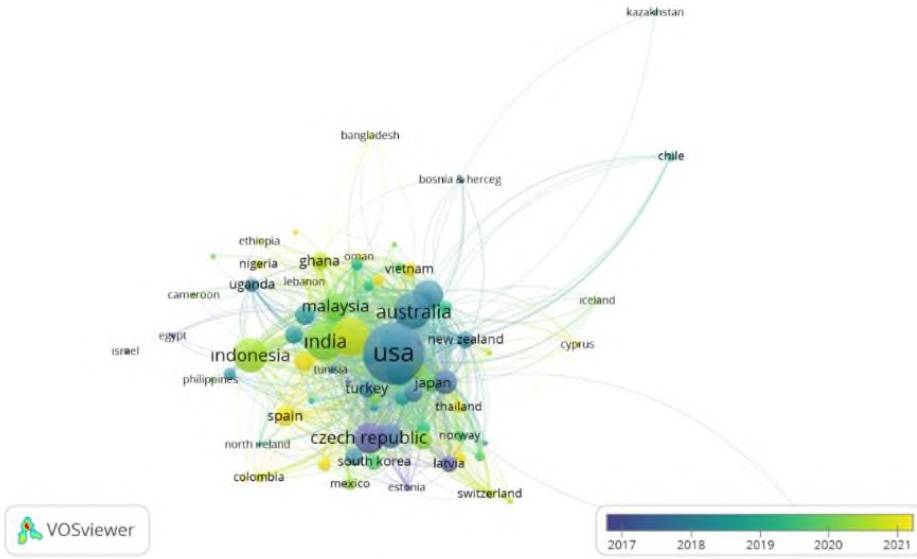

Figure 3. Stratification of countries' attribution connects by year

Source: Authors' own elaboration.

3.4. Citation of Organizations

In order to determine the stratification status of the bibliometric match ties of the institutions on a yearly basis, it was determined that there were 33 clusters, 16197 connection power and 23954 total connection power as a result of the analysis with 888 units that were found to have a relationship, provided that one institution had published at least one study and had at least one citation. Such pairings can be important to show how widely accepted the topic or work is and how deep the work on it has become. These institutions included: George Washington University (20) works, the University of Pennsylvania (13) works, and the University of Groningen and the University of Western Australia (12 works).

The most cited studies are George Washington University (4055 citations), the University of Pennsylvania (4001 citations), Dartmouth College (2467 citations) and the University of Groningen (1787 citations). The institutions with the most total connection power are the University of Washington in Georgia (2664 total connection strength), the University of Pennsylvania (2298 total connection strength), Dartmouth College (1380 total connection strength), and the University of Groningen (1157 total connection strength). When the bibliographic

match ties of the institutions are examined on a yearly basis, it is determined that they are limited between 2016 and 2022.

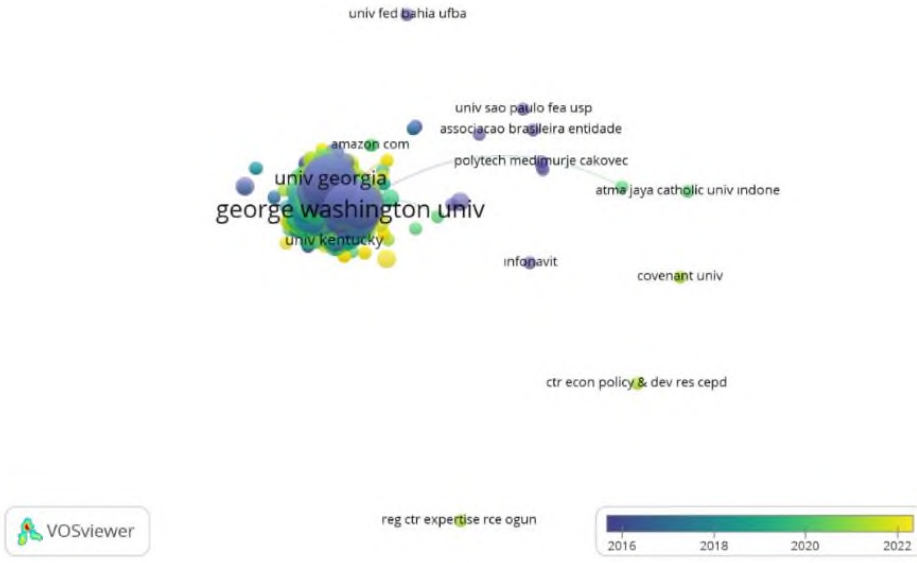

Figure 4. Stratification of bibliographic match connections of institutions by year

Source: Authors' own elaboration.

3.5. Co-occurrence of All Keywords

When the most frequently included keywords in the publications related to the concept of "financial literacy", have a relationship between them at least twice in the study, the keywords "financial literacy" with 825 repetitions in terms of 1841 total connection strength, "financial education" with 111 repetitions in terms of 315 total connection strength, "financial behavior" with 65 repetitions in terms of 217 total connection strength and "financial knowledge" with 71 repetitions in terms of 213 total connection power are seen. As a result of the analysis performed, it was determined that there were 2265 connection powers and 4069 total connection powers for a total of 36 clusters.

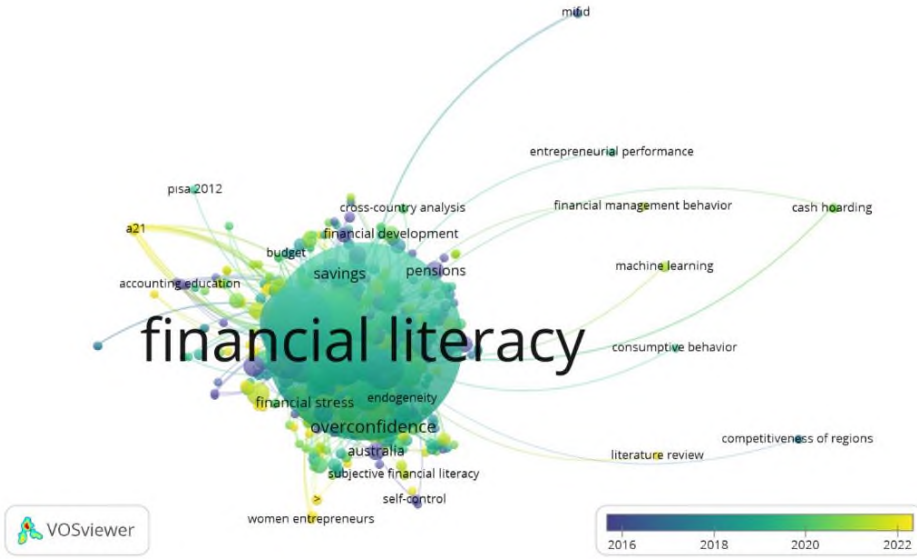

Figure 5. Layering of the most frequently used keyword links over the years

Source: Authors' own elaboration.

3.6. Bibliographic Coupling of Authors

In the study, it was concluded that the authors who published at least one work and had the condition of having one citation at the same time had seven clusters, 102651 connections and 744498 total connection power in the context of bibliographic match analysis. The author with the most bibliographic matches is Annamaria Lusardi with 6541 citations and a total link strength of 42112.

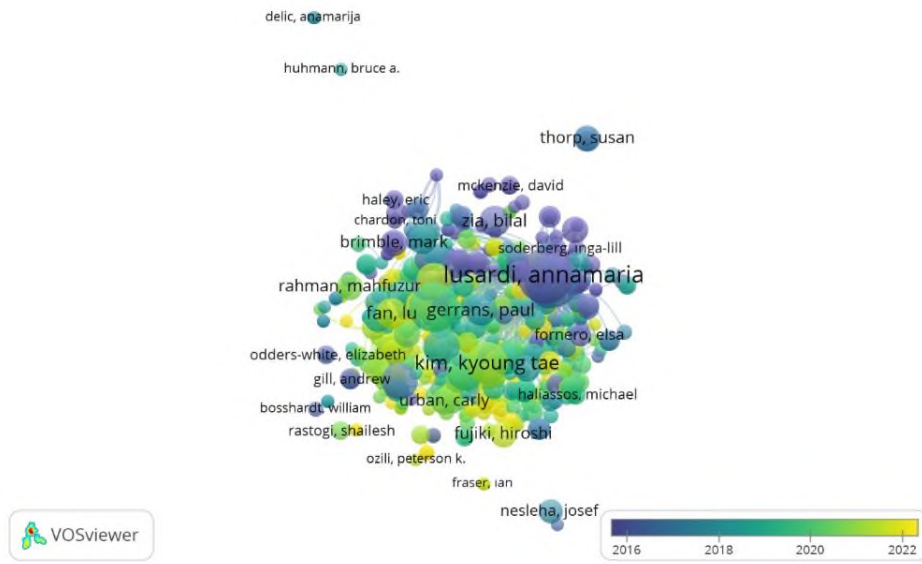

Figure 7. Bibliographic matching links of authors

Source: Authors' own elaboration.

3.7. Co- authorship of Organizations

With a total of 33 connection strengths, the most cited institution was determined to be George Washington University (4055 citations). With a total link strength of 23, it is the University of Groningen (1787 citations).

As a result of the analysis carried out by selecting the minimum number of citations as 1, a total of 27 clusters and 611 connection powers and 666 total connection powers were reached. Looking at the stratification status of the ties between the institutions of the co-authors on a yearly basis, it was determined that they were limited between 2014 and 2022.

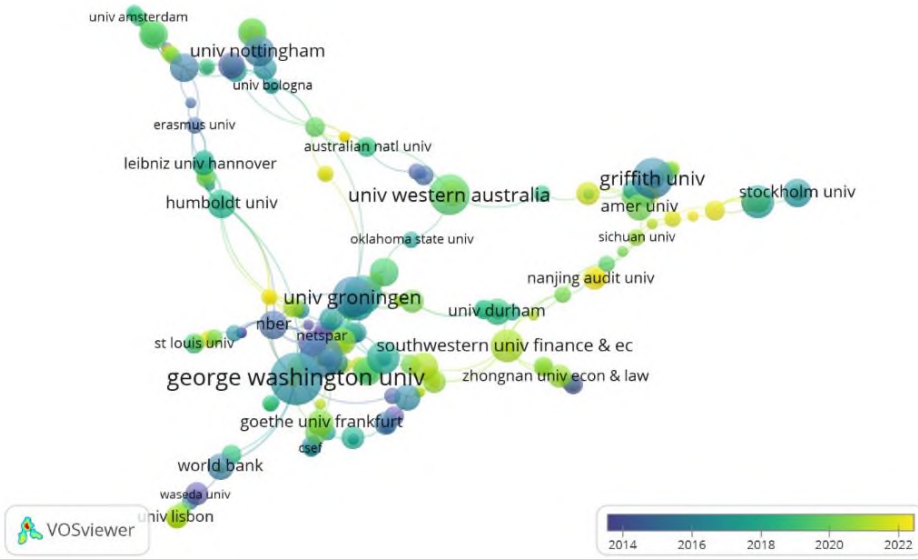

Figure 8. Stratification of Connects Between Co-Authors' Institutions by year

Source: Authors' own elaboration.

3.8. Evaluation of Hypotheses

Table 2. Realization/nonrealization of hypotheses

Hypotheses	Provided	Not Provided
H_1: It is assumed that the most commonly used keyword is "financial literacy".	X	
H_2: It is assumed that there is an increase in financial literacy publications in the context of temporal evolution.	X	
H_3: It is assumed that English-language journal articles predominate.	X	
H_4: The United States is assumed to have the highest citations.	X	
H_5: It is assumed that the citation links between the years show limited stratification.	X	
H_6: It is assumed that the call for the inclusion of Scopus and PubMed databases in future research will provide a more comprehensive understanding of financial literacy research.	X	

Source: Authors' own elaboration.

H_1:The interconnectedness and frequency of keywords such as "financial literacy," "financial education," "financial behavior," and "financial knowledge" in the bibliometric analysis suggest a dynamic evolution of research trends, indicating a growing emphasis on the interplay between these concepts.

H_2: The observed surge in financial literacy publications, peaking in 2022 with sporadic publications in earlier years, implies a changing landscape influenced by global economic dynamics, leading to increased awareness and interest in the field.

H_3: The dominance of English-language journal articles underscores a potential language bias, and the prevalence of traditional scholarly channels suggests a need for future research diversification in terms of both publication types and languages.

H_4: The high citation counts for the United States, the Netherlands, and England indicate their leadership in shaping the financial literacy discourse, while the ranking of countries based on publications and citations underscores the global nature of financial literacy research contributions.

H_5: The limited stratification of citation ties between 2017 and 2021 suggests a concentrated period of influential financial literacy research, possibly linked to significant policy changes, educational initiatives, or economic events during that timeframe.

H_6: Acknowledging limitations in using only the Web of Science database, the call for future research to include Scopus and PubMed databases is hypothesized to provide a more comprehensive understanding of financial literacy research, capturing a broader spectrum of studies for a holistic analysis of the field.

CONCLUSIONS

This study conducted on August 1, 2023, aims to reveal the effect of the study by visually presenting the analysis of the studies on the concept of "financial literacy". Bibliometric analysis of the studies published in the Web of Science (WOS) database between 1991 and 2023 was analyzed with the VOSviewer (Version 1.6.9) package program. Since the title, content and keyword of the concept of "financial literacy" were intended to be scanned in all languages and all publication types, 2,889 works were accessed and analyzed.

When the most frequently included keywords in the publications related to the concept of "financial literacy", which have a relationship between them at least twice in the study, the keywords "financial literacy" with 825 repetitions in terms of 1841 total connection strength, "financial education" with 111 repetitions in terms of 315 total connection strength, "financial behavior" with 65 repetitions in terms of 217 total connection strength and "financial knowledge" with 71

repetitions in terms of 213 total connection power are seen. As a result of the analysis performed, it was determined that there were 2265 connection powers and 4069 total connection powers for a total of 36 clusters.

When we look at the year-by-year distribution, the most works were published in 2022 with a maximum of 426 works. At least one work was published in 2004, 2003, 1998, 1994 and 1991.

Among the published studies, journal article 2,515, proceedings paper 280, early access 135, book chapters 101, review article 68, editorial material 29, correction 6, book 5, book review 3 were determined as works.

The authors with the most publications were Olivia S. Mitchell (36 works), Annamaria Lusardi (34 works), Jing Jian Xiao (29 works), Kyoung Tae Kim (20 works), Gianni Nicolini (17 works), Andrzej Cwynar (16 works), and J. Michael Collins (15 works). When we look at the languages in which the published works are published, they are in English with a maximum of 2,814 works. At least two works are in French and Chinese.

As a result of the analysis carried out among the authors with the most connections between them, it was determined that there were 321 connections and 488 total connection strengths united in 26 clusters. The most cited authors is Annamaria Lusardi with 6541 citations. The author has published 35 works and has a total link power of 56. It is followed by Olivia S. Mitchell, with 3958 citations. The author has 34 published works and 37 total connection strengths. These two authors who have published the most studies are also the ones with the highest total connection power.

In order to determine the citation networks, at least one publication and at least one citation criterion were met in the context of author citation analysis, and year-based stratification status was determined. As a result of the analysis, 1553 units were found to be connected; with 48 clusters, it was determined that there was a connection power of 26225 and a total connection power of 37379. The most cited authors is Annamaria Lusardi with 6541 citations. It is followed by Olivia S. Mitchell, with 3958 citations and Rob J. Alessie with 910 citations. These three most-cited authors are also the ones with the highest total link power. When the citation links of the authors are examined on a yearly basis, it is seen that they are limited between 2014 and 2022.

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With a total of 33 connection strengths, the most cited institution was determined to be George Washington University (4055 citations). With a total link strength of 23, it is the University of Groningen (1787 citations).

As a result of the analysis carried out by selecting the minimum number of citations as one, a total of 27 clusters and 611 connection powers and 666 total connection powers were reached. Looking at the stratification status of the ties between the institutions of the co-authors on a yearly basis, it was determined that they were limited between 2014 and 2022.

CONFLICT STATEMENT

The author declares that there is no conflict of interest.

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HEALTH MODELS – FINANCING AND EFFECTS: A COMPARATIVE STUDY OF THE MODELS IN POLAND AND ITALY

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HEALTH MODELS – FINANCING AND EFFECTS: A COMPARATIVE STUDY OF THE MODELS IN POLAND AND ITALY

ABSTRACT

The purpose of the article. The study brings a comparative analysis between health systems in Poland and Italy. It is aimed at fulfilling the subject literature using economic comparative analyses between different health systems as well as straight comparisons between Polish and Italian health systems. Moreover, another aim of the study is to find out some weak points and to point out some good practices of each of the analyzed health systems. The research question for the purpose of this study is as follows: what changes can be implemented to improve the efficiency of each of the analyzed health systems?

Methodology. The study is carried out on the background of health systems' theory. The critical literature review is conducted. A comparative analysis using such indicators as percentage of GDP and GDP per capita spent on financing health systems, healthcare spending components, life-expectancy data or Euro Health Consumer Index indicators are applied and analysed in the study.

Results of the research. Health systems in Poland and Italy in the latest decades were transformed in a completely different way. Healthcare in Poland is based mainly on health insurance premiums whereas in Italy financing of healthcare is based mainly on taxes. Among similarities between the systems a high level of responsibility designated to local authorities may be mentioned. The

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comparative analysis indicates that the situation of the Italian health system seems to be much better as compared to its Polish counterpart. Though, some solutions, aimed at improving health system efficiency, can be transferred from one system to another in case of both analyzed systems.

Keywords: health system, healthcare system, Polish healthcare, Italian healthcare, healthcare in Poland, healthcare in Italy, health financing.

JEL Class: I11, I15, I18, P46, H75, G28, F39.

INTRODUCTION

Healthcare systems in Italy and Poland are quite different at the moment. Both of them through the years have undergone many reforms, transformations, and changes. It is worth pointing out the different directions concerning these transitions. The Italian healthcare system was transforming from insurance to a budgetary health financing system whereas the Polish one opposite – rather from a budgetary to an insurance one. That is why, the comparison of the current state and conditions of these two systems may be an interesting research study.

So far, the Polish healthcare system has been compared with the health systems of other countries from different economic perspectives – including the Kingdom of the Netherlands (Pastusiak and Krzeczewski, 2012: 53–67), the United Kingdom (Mosiewicz, 2022: 588–591), Germany and Denmark (Zawada et al., 2017: 123–130), the Kingdom of Netherlands, USA, Germany and Great Britain (Jaworzyńska, 2016: 41–51), Czech Republic (Łuczak, 2018: 1396–1409), Hungary, Slovakia and Czech Republic (Dlouhý, 2016: 242–246) or some other Central European countries (Gańczak et al., 2020: 1–29). Also, there can be found some studies comparing different aspects of healthcare systems between Poland and Italy. Nonetheless, none of them is focused on some basic economic indicators. There can be rather found studies focused on aging and long-term care problems (Drożdżak et al., 2013: 205–230), some cross-cultural differences concerning different medical problems (Matson et al., 2017: 70–76; Lion et al., 2020: 947–955), differences in health promotion policies for elderly (Arsenijevic and Groot, 2022: 69–73), medical tourism (Pforr et al., 2020: 244–261), patients' experience and satisfaction (Brédart et al., 2001: 243–253; Brédart et al., 2003: 68–77; Baldelli et al., 2019: 1–15) or some aspects of COVID-19 pandemic (La Foresta and Dziadkiewicz, 2020: 1–159; Cervia et al., 2023: 595–613). That is why, our study is aimed at fulfilling the subject literature using economic comparative analyses between different health systems and straight comparisons between Polish and Italian health systems as well.

Conducting such studies can bring important information for other countries with similar healthcare systems that also meet similar problems. Moreover, it is indicated that there is still a need and space for reforms to improve the efficiency of the health system in Poland (Miszczyńska and Miszczyński, 2021: 2743–2770). Also, the Italian healthcare system is not free from any drawbacks.

Making comparative studies between different healthcare systems is fully justified and widespread (Wendt, 2009: 432–445; Pastusiak and Krzeczewski, 2012: 53–67; Beckfield et al., 2013: 127–146; Dlouhý, 2016: 242–246; Jaworzyńska, 2016: 41–51; Haczynski et al. 2017: 53–66; Zawada et al., 2017: 123–130; Łuczak, 2018: 1396–1409; Gańczak et al., 2020: 1–29; Mosiewicz,

2022: 588–591) and always bring some important information concerning functioning of health systems.

Bearing in mind the latest problems associated with the COVID-19 pandemic that healthcare systems all over the world met, conducting such studies seems to be of great importance. Hence, another aim of the study is to find out some weak points and to point out some good practices that can be implemented from one system to another to make some improvements. It can bring a fresh view of the solutions that are used and allow us to formulate some remarks concerning the functioning of each of the analyzed health systems.

1. DIFFERENT MODELS OF FINANCING HEALTH SYSTEMS

Generally, there can be distinguished three main types of healthcare financing models (Lameire et al., 1999: 3–9):

- Bismarck model – based mainly on financing from the insurance premium paid under the social security system, as well as characterized by the presence of both public and private providers;
- Beveridge model – based primarily on tax revenues and characterized by a large number of public service providers;
- The private insurance model – until recently only found in the United States and largely based on voluntary private insurance.

Sometimes these models are called respectively: the Social Health Insurance Model, the National Health Services Model, or a residual model.

In the case of the Bismarck and Beveridge models in a typical form, the financing is based mainly on public funds. Though, in the first one health insurance premium is charged as a certain percentage of the salary, whereas in the latter one the patients' contribution concerning the financing of the system is usually not dependent on the received salary but on taxes, and all citizens can benefit from health services – regardless of their previous contribution to the financing of the system (Busoi, 2010: 5–7).

The private insurance model actually does not exist in its clear form anymore. It was a characteristic model for the United States of America until the presidency of Barack Obama (2009–2017). In 2010, due to very high health expenditures, the House of Representatives passed a health bill intended to provide access to health services to uninsured U.S. citizens and mandate mandatory purchase of health insurance (Gazeta Wyborcza, 2010). The residual model was characterized by the principle of individual responsibility for one's health, leaving the choice to join or not to join the health insurance to each citizen. It was based on the private insurance premiums paid by the employers. Individual insurance plans were also available. However, there could be a public funds part of the system dedicated to the elderly and disabled people in the form of Medicare and Medicaid programs

respectively. Moreover, from the public funds, there were also finance Department of Veterans Affairs (VA) and State Children's Health Insurance Program – so-called SCHIP (Selden and Sing, 2008: 349–359).

Sometimes in the subject literature, there is also distinguished the fourth type of healthcare financing model – i.e. the Semashko model. Anyway, the basic principles of the Semashko model are largely consistent with the Beveridge model of the National Health Service and are based on the responsibility of the state for the health of its citizens. However, the Semashko model was actually abandoned and does not exist anymore in its basic form (Michalak, 2013: 205–215), similarly to the private insurance model.

The Semashko model was characterized by central planning and management as well as free and unlimited access to health services for all citizens. This model favored hospital care over primary care or medical outpatient services. It should also be emphasized that in the case of this model, healthcare was not a priority in state spending (as it was in the case of national defense, etc.) and was perceived as a source of costs, rather than an investment in society (Antoun et al., 2011: 436–448).

Occasionally, in the subject literature, there can be found other divisions of health financing models as well. For example, Böhm et al. (2013: 258–269) argue that there can be distinguished five main types of health financing models – i.e.: the National Health Service, the National Health Insurance, the Social Health Insurance, the Etatist Social Health Insurance, and Private Health System. Another division can be found in the work by Rice and Smith (2001: 81–113) where: competitive insurance plans, employer-based insurance plans, public sector centralized, and public sector devolved models can be found. Generally, an interesting classification review concerning healthcare models can be found also in the work by Freeman and Frisina (2010: 163–178).

As a matter of fact, nowadays it is difficult to find one particular health financing model existing in its clear and typical form. Healthcare financing models have a significant level of diversity which is related to the blurring of boundaries between different types of models due to the selective transfer of solutions used in one model to another between different countries (Busoi, 2010: 5–7; Schmid et al., 2010: 455–486).

No matter what classification of health financing model is absorbed by researchers, it is still difficult to say which of the models can be portrayed as the best one. Some analyses have been brought in the analyzed matter (Van der Zee and Korneman, 2007: 1–11; Tenbensel et al., 2012: 29–36), however, the results seem to be quite ambiguous. Hence, it is worth to carefully analyze and compare different kinds of models to find the best solutions and practices used.

2. DATA AND METHODS

For the purpose of this study health systems in Italy and Poland have been selected. As pointed out earlier such a choice is an interesting research task as the chosen systems seem to be on different poles bearing in mind the direction of health transformation and the aforementioned models of financing health systems. The Italian healthcare system was transforming from insurance to a budgetary health financing system whereas the Polish one quite opposite – rather from a budgetary to an insurance one. Moreover, health systems of these two countries can be reliably comparable as both of them – i.e. Italy and Poland – are the long-term members of the Organisation for Economic Co-operation and Development. Hence, comparable and standardized data is supplied through the OECD databases. This Organisation keeps healthcare statistics on an ongoing basis. Though, it is worth to bear in mind the differences in the levels of economic development between countries and obviously to come to the presented analysis with some level of caution. Nonetheless, analysing examples of these two different systems, and bearing in mind the aforementioned ambiguousness in health systems' effectiveness assessment, it has been attempted to answer the following research question: what changes can be implemented to improve the efficiency of each of the analyzed health systems.

The study is aimed at fulfilling the subject literature: firstly using economic comparative analyses between different health systems, and secondly presenting straight comparisons between Polish and Italian health systems. As it is indicated in the introduction section there exists the research gap in this matter that needs to be fulfilled.

The study is carried out on the background of health systems' theory. Moreover, in our study we conduct critical literature review dedicated to health systems in Italy and Poland to present the overall characteristics concerning each of them. We focus mainly on financial aspects. What is more, using the OECD data we conduct also a comparative analysis between Italian and Polish health systems on the background of the OECD average, presenting such indicators as percentage of GDP and GDP per capita spent on financing health systems, healthcare spending components or life-expectancy data. The Euro Health Consumer Index indicators are applied and analysed in the study as well.

3. RESULTS

3.1. Current shape of the health system in Italy

The health system in Italy has been changing over the years – from the system initially based on insurance premiums to a budgetary one (Urbaniak, 2014: 289–

301). Nowadays, healthcare in Italy is organized in the form of the National Health Service (NHS) with universal coverage for the whole society. It is portrayed as a highly decentralized one – i.e. Italian regions are assigned a high level of autonomy in financing and organizing health services in their territory. Hence, the relatively weak strategic leadership of the central Italian government is indicated. The Italian health model is based mainly on public financing. It does not include an insurance premium. Instead, its financing is based mainly on tax revenues, which come from the state budget or the budgets of individual regions in Italy. Moreover, in the Italian health system there exist so-called co-payments. It is the obligations of patients to participate in the costs of functioning of the health system in Italy by paying fees in exchange for receiving a specific type of health service. Approximately 95% of the Italian NHS funding comes from direct and indirect taxation, whereas the rest comes from regional health institutions and the tickets paid directly by patients in the form of co-payment (Armocida et al., 2020; Lenio 2018: 81–95; Cicchetti and Gasbarrini, 2016: 1–3).

Underneath there are presented some examples of co-payment in the Italian NHS (NHF, 2023):

- a primary care visit – co-payment up to EUR 36,15 per referral;
- a specialist care visit – partial co-payment of the referral;
- a dental treatment – the full cost of the referral;
- medicines – there can occur full payment or partial co-payment; some medicines are available free of charge or they can be covered by a lump sum;
- transportation to the hospital – partial co-payment.

There are three main levels of the Italian healthcare system – i.e. central, regional, and local one. Concerning the central level, it is realized by the national government through the Ministry of Health and plays a strategic and guiding role in the Italian healthcare system. There are set the system's fundamental goals and rules, policy and planning frameworks, and the package of health services guaranteed across the country (*Livelli Essenziali di Assistenza, LEA*) are determined as well. Moreover, national funds are allocated to the Italian regions. At the regional level, the institutions are responsible for organizing and delivering healthcare services. There are 21 regions in Italy. Due to a high level of autonomy attributed to the regions some differences in the quality of healthcare can be observed, which is associated with a high flow of patients – usually from the south to the center-north regions. Bearing in mind the local level, primary and specialist care and public and community health services are delivered by local health authorities called Aziende Sanitarie Locali – ASL (Cicchetti and Gasbarrini 2016: 1–3; De Belvis et al., 2012: 10–16).

3.2. Current shape of the health system in Poland

The current shape of the Polish healthcare system is strictly connected with the transition from a centrally planned economy to a market-oriented system that started at the turn of the 80s and 90s of the 20th century. Though, the most important changes to the health system were introduced by the big reform in 1999. It brought a complete change in the financing of the Polish health system, where instead of a centralized budget system, an insurance and budget system came into force, with a significant advantage of the insurance part. Until the aforementioned reform, the entire health system remained in the centralized structure of the central government administration, and its sources of financing came directly from the state budget. According to new regulations, health policy and preventive health programs, highly specialized medical services, medical rescue services, medical staff training, scientific research, administrating activities in the system, and functioning of sanitary and epidemiological or blood donation stations are to be financed directly from the state budget. Other benefits and services should be covered by the health contribution in the form of health insurance premium paid together with a personal income tax (Nojszewska et al., 2017: 27–29; Kludacz-Alessandri, 2017: 71–72). Health insurance allows patients to use a wide scope of health services without the need for co-payment in Poland (Miszczyńska and Miszczyński, 2021: 2743–2770).

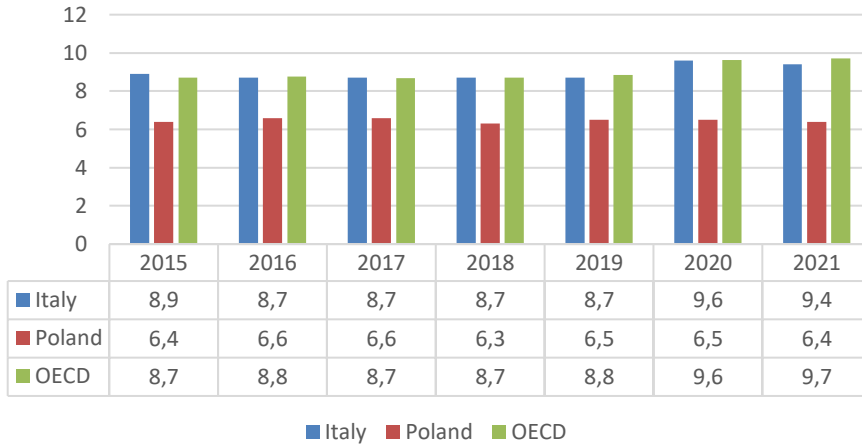
Generally, there can be distinguished four main entities in the Polish healthcare system: the organizer – i.e. parliament, government and local government units (LGUs); the payer – i.e. the National Health Fund in Poland (*Narodowy Fundusz Zdrowia*); health services' providers – i.e. hospitals, ambulatories, etc.; and beneficiaries of healthcare services (Miszczyńska, 2019: 25–40).

The funds coming from the health insurance premium are firstly gathered and then allocated by the National Health Fund in Poland, which is a third-payer party in the system. The National Health Fund consists of a central headquarters and 16 regional departments – designated to each of the Polish provinces (which are similar to Italian regions) and exist in the form of local government units (Krzeczewski, 2019: 44–45). The National Health Fund in Poland is portrayed as the main payer of the health system in Poland (Miszczyńska and Miszczyński, 2021: 2743–2770).

The aforementioned reform enforced some level of responsibility on local government units concerning healthcare. Many of the LGUs became founding bodies for independent public healthcare institutions (Krzeczewski, 2013: 271–284).

3.3. Comparisons between Italian and Polish health systems

Comparing both analyzed healthcare systems – i.e. Polish and Italian ones – it is good to have a look in the first place on the financing level of each of them. It is usually measured as a percentage of GDP spent on health expenditures.



	2015	2016	2017	2018	2019	2020	2021
Italy	8,9	8,7	8,7	8,7	8,7	9,6	9,4
Poland	6,4	6,6	6,6	6,3	6,5	6,5	6,4
OECD	8,7	8,8	8,7	8,7	8,8	9,6	9,7

Chart 1. Percentage of GDP (%) spent on financing healthcare

Source: own study based on the OECD data.

As it can be seen above, Italy spends more on financing healthcare as compared to Poland. Moreover, in the whole analyzed period healthcare spending in Italy is very close to the OECD average whereas healthcare spending in Poland is much lower. It indicates that the healthcare system in Poland is underfinanced – not only when compared to Italy but to the OECD average as well.

It is also good to have a closer look at the spending's components. The charts analyzing the main positions concerning healthcare spending in each country are presented below.

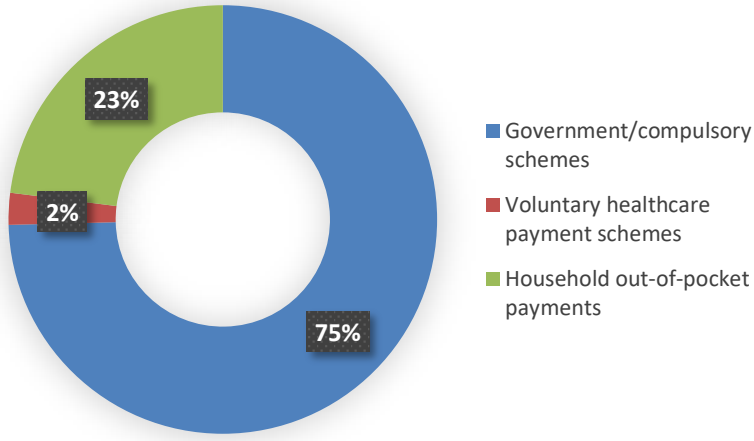


Chart 2. The main components of healthcare spending in Italy

Source: own study based on the OECD data.

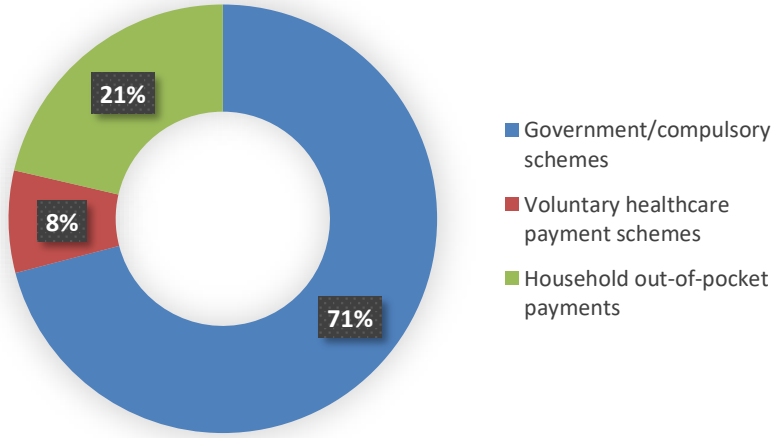
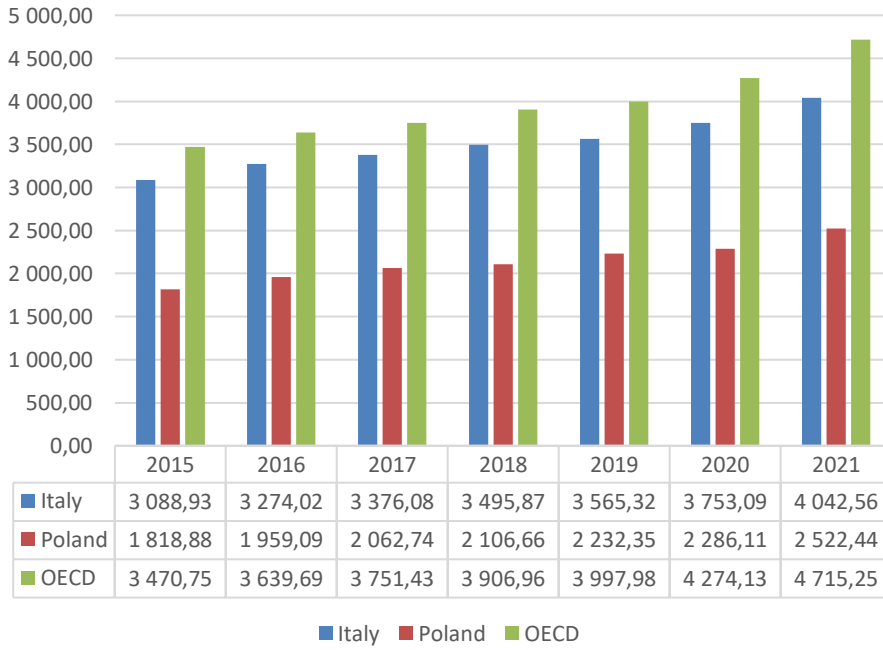


Chart 3. The main components of healthcare spending in Poland

Source: own study based on the OECD data.

Bearing in mind the healthcare spending components, it is visible that in both cases government or compulsory schemes are the most important positions exceeding 70%. They may be portrayed as public funds' spending. In Poland, there is a higher value as compared with Italy of voluntary healthcare payment schemes (8% vs. 2% respectively). In Poland, they are usually supplied by employers to their employees. What is interesting, Italy and Poland are characterized by a similar level of household out-of-pocket payments (23% vs. 21% respectively) whereas there exists co-payment in the Italian healthcare system, but in Poland, it does not. It may suggest that in Poland direct private healthcare services seem quite important.

Additionally, we also present the value of health expenditures of GDP per capita expressed with the usage of purchasing power parity (PPPs) to make the comparison between countries as reliable as possible. Data using PPPs is usually expressed in US dollars.



	2015	2016	2017	2018	2019	2020	2021
Italy	3 088,93	3 274,02	3 376,08	3 495,87	3 565,32	3 753,09	4 042,56
Poland	1 818,88	1 959,09	2 062,74	2 106,66	2 232,35	2 286,11	2 522,44
OECD	3 470,75	3 639,69	3 751,43	3 906,96	3 997,98	4 274,13	4 715,25

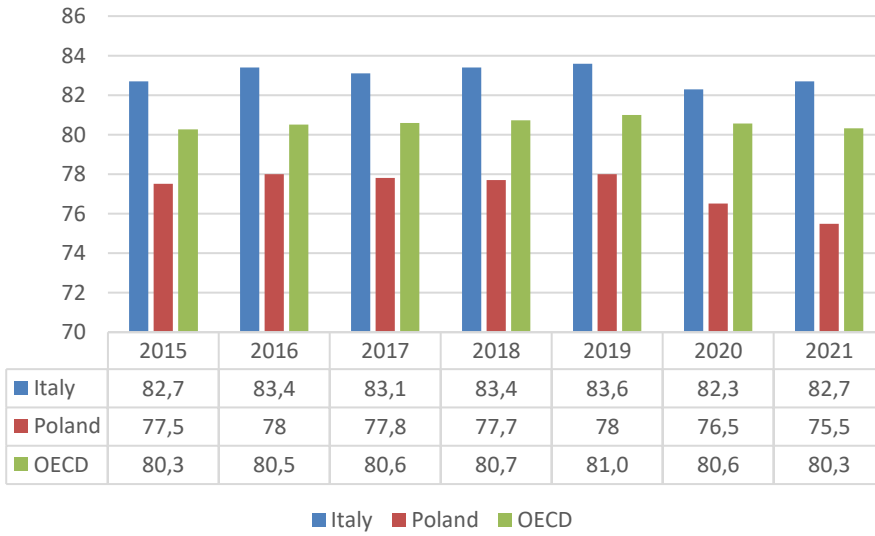
Chart 4. Healthcare spending, GDP per capita, current PPPs (US dollars)

Source: own study based on the OECD data.

The remarks concerning GPD per capita spending on healthcare are more or less consistent with those with the overall percentage of GDP spent on financing

healthcare. Poland is far below the OECD average, with differences hesitating between 1 651,87 and 2 192,82 US dollars in the analyzed period, whereas Italy is much closer to the average. However, here it is visible that when the overall healthcare spending is divided per capita every year in the analyzed period, Italy spends a few hundred US dollars less than the OECD average – the direct differences hesitate between 365,67 and 672,70 US dollars. The direct differences between Poland and Italy are between 1 270,05 and 1 520,12 US dollars spent per capita in favor of Italy.

Finally, it is good to have a glance at some effects of each healthcare system, which can be characterized by life-expectancy data. The chart concerning such data is presented below.



	2015	2016	2017	2018	2019	2020	2021
Italy	82,7	83,4	83,1	83,4	83,6	82,3	82,7
Poland	77,5	78	77,8	77,7	78	76,5	75,5
OECD	80,3	80,5	80,6	80,7	81,0	80,6	80,3

Chart 5. Life-expectancy data (total population at birth)

Source: own study based on the OECD data.

Looking at life-expectancy data it can be observed that again Poland is below the OECD average whereas in Italy life expectancy is even higher than the OECD average. The direct differences in life expectancy between Poland and Italy hesitate between 5,2 to 7,2 years in the analyzed period in favor of Italy. To the OECD average Poland loses between 2,8 to 4,8 years whereas Italy gains between 1,7 to 2,9 years in life expectancy concerning the analyzed period. Keeping in mind that the healthcare spending per capita in Italy is slightly lower as compared to the OECD average such results indicate a good situation and strength of the Italian healthcare system.

However, except for some economic indicators and life-expectancy data, it is good to have a look at some other non-economic characteristics like patients' attitudes toward the analyzed healthcare systems. The Euro Health Consumer Index (EHCI) supplies some important remarks on this matter analyzing patients' rights, accessibility and waiting times of healthcare services, health outcomes, range and reach of services provided, or accessibility to pharmaceuticals. The latest reports of the EHCI indicate that the Polish health system is perceived by the patients as of poor quality (29–34 position out of 35 European countries). The situation of the Italian one, although is not perfect, it is definitely much better (20–22 out of 35 European countries). In Poland, the main problems over the years seem to be some aspects of online access to healthcare (like e-accessibility to patient records or e-prescriptions – though many improvements can be seen in these areas after the COVID-19 pandemic). Other important problems in Poland include fast accessibility to major elective surgery and cancer therapies, cancer survival rate, informal payments to doctors in the system, long term care for the elderly, percentage of dialysis done outside of the clinic, cesarean sections or blood pressure prevention. Well-perceived aspects include access to new drugs, infant vaccinations, or the level of physical activity. By contrast, in Italy, well perceived factors are the same-day accessibility to family doctors, stroke treatment, life expectancy or alcohol, and HPV prevention. The main problems over the years seem to be prescription subsidies, access to new drugs, antibiotics consumption per capita, fast accessibility to CT scans, MRSA infections, or cesarean sections (EHCI, 2023). Also, the number of patients reporting excessive co-payments can be observed (De Belvis et al., 2012: 10–16) and the high need for stronger cooperation between public and private sectors is emphasized (Armocida et al., 2020).

CONCLUSIONS

The present study shows that the directions of healthcare reforms were completely different in Poland and Italy. None of the systems – the Polish or Italian one – can be classified as a typical Beveridge or Bismarck model in its pure form which is consistent with the remarks presented by Busoi (2010: 5–7) and Schmid et al. (2010: 455–486). However, as the financing of healthcare in Poland is based mainly on health insurance premiums it has much more in common with the Bismarck model as compared with other types of health systems. In Italy the main way of financing is based on taxes, hence, it has much more in common with the Beveridge model in turn. Anyway, some similarities between Polish and Italian models can be also observed. In both analyzed countries during the health systems' reforms, a lot of responsibility was assigned to local authorities – i.e. to regions in Italy and to LGUs in Poland.

Looking at some economic indicators, it is visible that the situation of the Italian healthcare system seems to be much better as compared to its Polish counterpart. The health system in Poland seems to be underfinanced – it is indicated not only by the comparison to Italy but to the OECD average as well. To some extent these differences can be explained by different levels of economic development between Poland and Italy and probably also by different attitudes to healthcare policy applied by these countries. Also, some obtained health system effects – measured by life-expectancy data – seem to be much better in Italy as compared to Poland. Better results of the Italian budgetary system would be consistent somehow with the results by Tenbensel et al. (2012: 29–36) who using a sample of 11 developed, high-income countries, indicate that better results in terms of health indicators can be observed in budgetary model. Yet, it remains in contrast to Van der Zee and Korneman (2007: 1–11) who using a sample of 17 European countries, indicate that insurance models are characterized by slightly better results as compared to the models of the National Health Services. However, it is not easy to give a clear answer as to which system is better in our case – the National Health Service (NHS) in Italy or the Social Health Insurance Model in Poland – due to the aforementioned level of financing. The differences in health effects may derive from the fact that the Polish health system seems to be underfinanced.

Nevertheless, neither of the presented health systems seems to be perfect. The article indicated some drawbacks of the Polish healthcare system that have been ever-present over the years – including online access to healthcare, fast access to some healthcare services, some problems with prevention activities, etc. Yet, some drawbacks of the health system identified by Italian citizens were also mentioned, among others: fast accessibility to CT scan, problems with excessive co-payment, prescription subsidies, access to new drugs, etc. These results correspond somehow to the remarks by Armocida et al. (2020), Cicchetti and Gasbarrini (2016: 1–3), and De Belvis et al. (2012: 10–16) indicating that long waiting times for outpatient and diagnostic services and, as a result, the lack of timely interventions seem to be a problem in the Italian healthcare.

Focusing on the answer to the research question of the article, it can be stated that among the main postulates that could help to improve the health system's efficiency is definitely increasing the level of financing the system in Poland. Getting much closer to the OECD average, as Italy does, would be surely a good practice. Obviously, some may say that the supply of healthcare seems to be limited whereas the demand is unlimited. Hence, putting some extra funds into the system will not fix the bulk of the problems, but at the moment – looking at the presented economic indicators – underfunding of the Polish healthcare system is a serious and real problem. Finding how to solve it seems to be of a great importance. A solution that could be considered in this matter, looking at Italy, is

implementing co-payment – even at a very low level. On the one hand, it might be difficult due to political reasons and the aversion of the Polish society to do so. But on the other hand, in Italy, such a form of financing healthcare exists and allows for limiting the demand for health services only when it is really necessary. Though, there are some complaints about excessive increases in co-payment levels (De Belvis et al., 2012: 10–16). However, such the co-payment could be covered by some extra insurance premiums, which would probably somehow reduce the burden for the society. Such the solution – enhancing the meaning of the insurance premium concerning co-payment – could be also a reasonable thing to consider in Italy where the aforementioned level of voluntary healthcare payment schemes is rather low.

Making life expectancy higher in Poland is another serious task. Although the level of physical activity is well-perceived in Poland, this is not enough to maintain an adequate level of life expectancy – which is much lower not only as compared to Italy but also to the OECD average. This problem may be again strictly associated with the aforementioned level of financing healthcare. Higher funds could be allocated, for example, to preventive healthcare activities (which in Poland seems to constitute a problem), which could result in better health effects.

Undoubtedly, the deliberations presented in the study fulfill the subject literature aimed at economic comparative analyses between different healthcare systems as well as straight comparisons between the Polish and Italian healthcare. Moreover, the study additionally presented some weak points that occur in the analyzed healthcare systems and possible solutions aimed at making necessary improvements. The deliberations presented above can be definitely further explored and developed in other studies dedicated to the problem of health systems analysis.

DISCLOSURE STATEMENT

The authors report no conflicts of interest.

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NEXT PANDEMIC? YES, PLEASE! HOW COVID-19 PANDEMIC IMPROVED THE FINANCIAL CONDITION OF POLISH HOSPITALS

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NEXT PANDEMIC? YES, PLEASE! HOW COVID-19 PANDEMIC IMPROVED THE FINANCIAL CONDITION OF POLISH HOSPITALS

ABSTRACT

The purpose of the article. The study aims to analyze how these special rules of financing during the pandemic affected the financial situation of hospitals in Poland.

Methodology. We analyzed a sample of 86 Polish hospitals from 2019 to 2021. The financial condition is assessed based on financial ratios and the synthetic measure M1. We employ the Kruskall-Wallis test to confirm the differences between the values of financial ratios in the analyzed period.

Results of the research. We confirm that due to the special rules and financing, combined with underperformance, the financial condition of Polish hospitals has slightly improved – especially in the case of operating margin, EAT to debt ratio and ROA.

Keywords: hospital financial condition, pandemic, operating margin, ROA.

JEL Class: I11, H51, M21.

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INTRODUCTION

The COVID-19 pandemic primarily covered the period 2020–2021, in which a significant part of resources was redirected to meet the needs of infected patients. This redirection of resources was accompanied by substantial sanitary and epidemiological restrictions, resulting in limited access to services for other patients.

The financial condition of Polish hospitals is the subject of continual discussion – and despite constant changes in the rules of financing – it has not improved (Miszczyńska and Miszczyński, 2021). The pandemic has created entirely new conditions for the functioning of hospitals. The study aims to analyze how these special rules, forced by the pandemic, have affected the financial situation of hospitals in Poland.

We hypothesize that limiting the number of services provided, combined with a flat-rate financing system and additional funding, could positively impact the financial situation of Polish hospitals.

A research sample covers 86 Polish hospitals from 2019 to 2021 and is limited by the data completeness. The data comes from the Orbis database.

1. HOSPITALS VS. PANDEMIC

The COVID-19 pandemic, which hit in late 2019 and early 2020, has put enormous pressure on health systems, especially in the hospital sector. The vast pressure revealed weaknesses related to the organization, such as personnel and equipment shortages or personal protective equipment.

When it comes to Poland, on March 2, 2020, numerous important solutions from the point of view of the functioning of the healthcare system were introduced, including transforming selected hospitals into infectious facilities, wards into infectious units and creating temporary hospitals (Chmielowiec et al., 2022).

Since then, most resources, especially inpatient care, have been diverted to treating COVID-19 patients, influencing the structure of medical services. As a result, medical rehabilitation activities and planned services have been substantially limited. In primary care, online doctor consultation has become a primal form of service provision. Hospitals began to function in a special sanitary mode, and from the point of view of "non-covid" patients, it created a vital barrier to healthcare services (Cantor et al., 2022). This limited access to health services was observed practically worldwide, and hospital services were affected by this decline to a greater extent than outpatient services (Xiao et al., 2021). Both lower and high-income countries, irrespective of the degree of the COVID-19 outbreak, reported a reduction in healthcare services utilization

(Dopfer et al., 2020; Melnick and Maerki, 2021; Roy et al., 2021; He et al., 2022), especially in the early days of the pandemic (Coughlin et al., 2020; Xu et al., 2021; Kim et al., 2022). Studies indicate a general decrease in the bed occupancy rate (Hu et al., 2022), except for intensive care beds (Trentini et al., 2022).

Without a doubt this decrease in the level of use of health services that was observed during the pandemic, may not only be related to limited access resulting from the redirection of funds for the treatment of infectious patients or the tightened sanitary regime and closure of health facilities but may also be the result of avoiding visits due to fear of infection during the pandemic (Lee and You, 2021; Synhorst et al., 2021).

Also, in Poland, despite the significant number of COVID-19 cases, the activity of hospitals in terms of medical services significantly decreased (Chart 1). The number of patients treated in 2020 fell by 24%, as did the number of medical services. In 2021, we could see a slight increase, but not to pre-pandemic levels (Grudziaż-Sękowska et al., 2022; Narodowy Fundusz Zdrowia, 2022). Patients usually indicated long waiting times and temporary closure of healthcare facilities or their transformation into COVID-19 dedicated centers as the most common barriers that lowered access to health services (Mularczyk-Tomczewska et al., 2022).

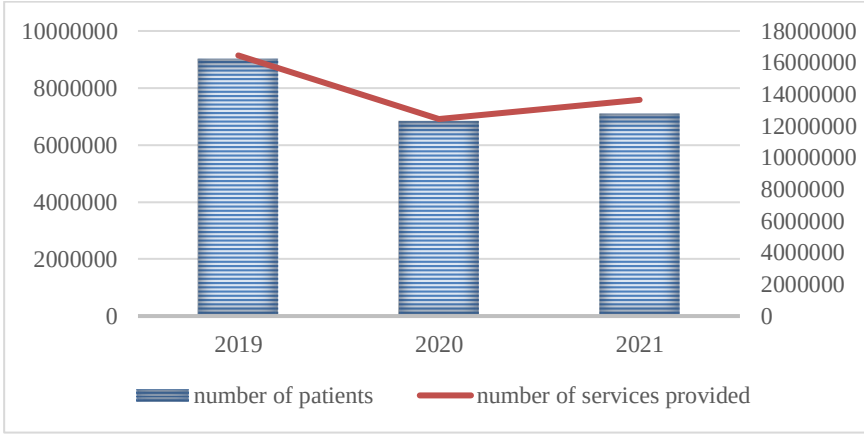

Chart 1. Number of hospital patients and provided services in 2019-2021 (PLN)

Source: own study based on Narodowy Fundusz Zdrowia (2022).

Lower performance, combined with increased hospitalization costs (György and Simionescu, 2021; Lalani et al., 2023), among others, due to the new sanitary regime or a higher number of cases requiring respiratory ventilation, strongly affected the financial situation of hospitals. The financial condition of inpatient facilities deteriorated significantly (Carroll and Smith, 2020; Fried et al., 2020;

Khullar et al., 2020; Behzadifar et al., 2022; Hu et al., 2022; Li et al., 2023). The American Hospital Association estimated that hospital losses reached $202,6 billion between March 1 and June 30, 2020 (Hu et al., 2022) and experienced a 45% decrease in operating revenue (Lalani et al., 2023). This decline was significant in the case of systems where hospitals are paid for performance. Hospitals suffered substantial losses in health systems where activity-based payment is the main financing scheme, and governmental control is limited (Waitzberg et al., 2021).

Several findings report an increased likelihood of financial distress in 2020 – higher by 6,93 p.p. compared to 2019 (Bai et al., no date; Wang et al., 2022). He et al. (2022) reported a negative impact on hospitals' operating margins (OM) in the USA. On the other hand, Li et al. (2023) found that California hospitals experienced a significant increase in total margin (TM), with government hospitals in a particularly good position. In terms of operating margins (OP), they also observed a solid growth, especially for large and medium-sized hospitals, with the growing gap between small and large hospitals. However, this situation should be treated as an emergency – the source of this change may be the increased payments that hospitals received in 2020, which were later corrected (Li et al., 2023). Using a case study method, Carroll and Smith (2020) show how the epidemic caused dramatic financial losses for hospitals and that the bulk of those losses are rooted in lost revenue. Lalani et al. (2023) studied the financial situation of U.S. academic hospitals and reported a deterioration in 2020 and subsequent improvement in 2021, although not all indicators have recovered to pre-pandemic levels. Wang et al. (2022), based on quarterly data, describe substantial volatility of financial indicators in Californian Hospitals during the pandemic. They also stress the role of governmental aid programs, which prevented progressive deterioration of financial performance.

Most European countries have introduced special mechanisms for financing hospitals during the pandemic to prevent the deterioration of hospitals' financial conditions. The solutions in this area were varied – usually, they consisted of introducing new rates for treatment (or updating the budget) or submitting additional payments to existing daily or case rates – expressed as pay rate or percentage (Quentin et al., 2020; Waitzberg et al., 2021, 2022; Küçük, 2022). Maintaining the current level of funding despite lower activity was one of the methods to deal with short-term financial shortages (Quentin et al., 2020).

As a result, in Poland, the reduced medical activity of hospitals was accompanied by a significant increase in funding. During the pandemic, hospitals obtained additional streams of funding to compensate for the extra costs associated with functioning in an increased sanitary regime (3% of the contract value) and financial allowances for medical staff involved in the care of COVID-19 patients (initially 50% and then, 100%, with a limit of up to PLN

15,000) (Narodowy Fundusz Zdrowia, 2021; Niżnik, 2021). At the same time, new rates for providing services for COVID-19 patients were introduced (Quentin et al., 2020). Although the share of expenditure on hospital treatment in total current spending decreased from 41% to 38% in the analyzed period, both expenditure on inpatient treatment and the value of hospital contracts steadily increased (Chart 2).

The new mechanism for financing hospital care, introduced in 2017, probably impacted the behavior of hospitals during the pandemic and, as a result, their financial situation. This reform aimed to ensure comprehensive access to hospital services and to guarantee adequate financing of hospital health services. The transition to a Diagnosis-related group (DRG) – based budget (estimated based on previous activity) was a vital change element. Healthcare providers qualified for the basic hospital provision system ("hospital network") have guaranteed financing of all services but cannot choose the range of services they intend to provide. A flat-rate system means the hospital receives an estimated budget based on previous activity (Mikos and Urbaniak, 2017; Pietryka, 2018; Quentin et al., 2020). In economic terms, this means a considerable change – hospitals have no economic incentive to accept more patients. In earlier periods, the treatment of more patients did not automatically guarantee increased financial resources. Still, finally, the payer usually reimbursed part of the overperformance, and some categories of benefits, such as labor, were financed without limits.

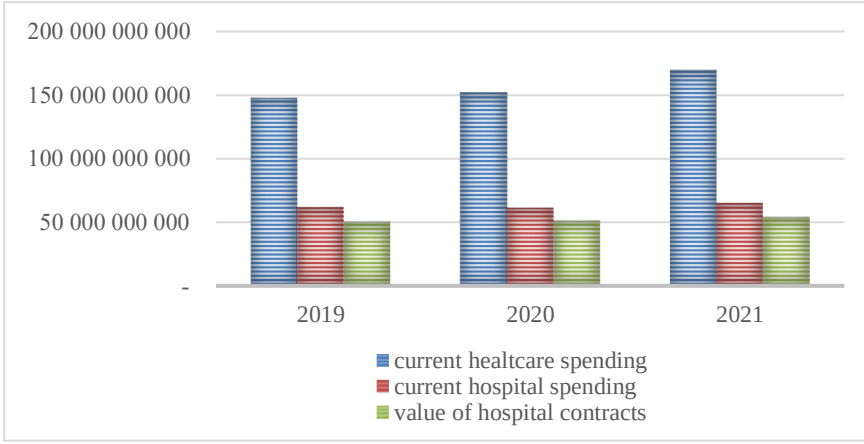

Chart 2. Current spending on healthcare in 2019-2021 (PLN)

Source: own study based on: Narodowy Fundusz Zdrowia (2022) and GUS (2022).

For Polish hospitals, this may mean an improvement in their permanently difficult financial situation. Naruć (2022) reports, based on a sample of infectious

hospitals, an increase in revenues during the pandemic, accompanied by an improvement in EBIT and EBITDA.

2. DATA AND METHODS

2.1. Research Method

Although each sector, including healthcare, has certain specificities, standard financial indicators are used in assessing financial condition. The evaluation of the financial health of hospitals should include the following six areas: profitability, fixed capital, efficiency, capital structure, fixed assets life, working capital efficiency and liquidity (Prędkiewicz and Prędkiewicz, 2013; Bem et al., 2014a; Bem et al., 2014b; Bem et al., 2014c; Prędkiewicz et al., 2014; Bem et al., 2015a, 2015b; Hu et al., 2022).

According to the gradient taxonomic measure, the M1 value for a company is determined as follows:

$$M1 = \frac{1}{m}\sum_{i=1}^{m}\frac{x_{ij} - \min(x_{ij})}{\max(x_{ij}) - \min(x_{ij})}$$

where:
x_{ij} – is the financial ratio,
i – is the indicator,
j – is the company,
m – number of companies,
$x_{ij} \in$ R.

Hence, the coefficients and the intercept are as follows:

$$coefficient_i = \frac{1}{\mathrm{m}(\max(x_{ij}) - \min(x_{ij}))}$$

$$intercept = \sum_{i=1}^{m}\frac{\min(x_{ij})}{\mathrm{m}(\max(x_{ij}) - \min(x_{ij}))}$$

In the study, we analyze the values of individual indicators but also use a synthetic measure of financial condition assessment developed using the gradient method, which is one of the taxonomic methods measuring the distance of a given object from the pattern. Measure values range from 0 to 1, where one

is the reference object (Bem et al., 2015c; Siedlecki et al., 2015; Bem et al., 2017, 2019). The indicators used in the construction of the synthetic measure of financial condition (M1) are summarized in Table 1.

Table 1. Financial indicators employed to create the synthetic measure (M1)

Formula	Abbreviation	Character	Group
EBIT/ Operating Revenue	OPM	Stimulant	Profitability
Current Assets/Current liabilities	CR	Nominant	Liquidity
Total Debt/Total Assets	DEBT	Destimulant	Debt
(Net Profit)/Long-term Debt	EAT/DEBT	Stimulant	Debt
Operating Revenue /Total Assets	TAT	Stimulant	Efficiency
Receivables/ Operating Revenue *365	DSO	Destimulant	Efficiency
(Net Profit)/Total Assets	ROA	Stimulant	Profitability

Source: own study.

After the transformations, we get the following formula of the synthetic indicator of the assessment of financial condition M1:

$$M1 = 0{,}1080OPM - 0{,}0662(CR - 0{,}26) - 0{,}0436DEBT + 0{,}0126\left(\frac{EAT}{DEBT}\right) + 0{,}0199TAT - 0{,}0009DSO + 0{,}1084ROE + 0{,}5995$$

The interpretation of M1 measure is presented in Table 2. It should be taken into account that the measure M1 is relative – i.e. in its construction the maximum and minimum values in the research group are employed. The ranges are determined on the basis of quartile analysis (Q1;Q2;Q3).

Table 2. Interpretation of the synthetic measure values (M1)

Financial condition	Range
Difficult (less than Q1)	0 – 0,541961
Poor (Q1-Q2)	0 ,541961- 0 ,573414
Good (Q2-Q3)	0 ,573414 - 0 ,59669
Very good (higher than Q3)	higher than 0 ,59669

Source: own study.

In subsequent stages, the following were analyzed:

- location measures for variables (median, min, max, quartiles),
- the condition of hospitals was assessed on the basis of the M1 measure in subsequent years (with interpretation ranges built on the basis of data from 2019),
- the significance of differences between years was tested based on the Kruskal-Wallis test.

The Kruskal–Wallis test by ranks (or one-way ANOVA on ranks) is a non-parametric method for testing whether samples originate from the same distribution, allowing to tell that not all groups are equal, but it doesn't specify which pairs of groups are different. The Kruskal–Wallis test does not assume a normal distribution of the residuals. It evaluates the following hypotheses:

- H0: the average ranks are all the same,
- H1: at least one average rank is different.

2.2. Research Sample

Data comes from Orbis Database and covers the years 2019–2021. Initially, data covered 612 entities identified by NACE code 8610 (Hospital activities). We introduced the initial condition that the income from sales must be higher than PLN 5 million. Next, we excluded entities other than hospitals (like sanatoriums or renal dialysis facilities). After removing observations lacking data, we finally obtained the sample of 86 hospitals.

The dataset has been tested to detect outliers using Grubbs' test. In this test the hypotheses are defined as follow:

- H0: There are no outliers in the data set,
- H1: There is exactly one outlier in the data set.

Table 3. Grubbs' test for analyzed variables

Variable	Mean	Grubbs' statistics	p-value
OPM2019	-0,02863	4,184947	0,000877
CR2019	0,43966	4,522447	0,000127
DEBT2019	1,01848	4,480145	0,000160
EAT/Debt2019	-0,22109	7,066059	0,000000
TAT2019	1,53529	5,876484	0,000000
DSO2019	36,81931	6,462924	0,000000
ROA2019	-0,04877	4,493807	0,000147
M1 2019	0,56826	3,192678	0,088614

OPM2020	-0,02243	3,921897	0,003488
CR2020	0,45660	4,409087	0,000252
DEBT2020	1,04767	5,117736	0,000002
EAT/Debt2020	-0,15533	5,573227	0,000000
TAT2020	1,50040	5,986708	0,000000
DSO2020	41,23874	7,514710	0,000000
ROA2020	-0,03463	4,295262	0,000473
M1 2020	0,56670	2,970660	0,203559
OPM2021	0,00556	3,955724	0,002941
CR2021	0,46009	4,863873	0,000014
DEBT2021	1,04132	3,511366	0,023816
EAT/Debt2021	0,19829	5,660053	0,000000
TAT2021	1,68904	3,761476	0,007632
DSO2021	35,48312	3,112309	0,120663
ROA2021	-0,00934	3,321542	0,053016
M1 2021	0,59014	4,250236	0,000610

Source: own study.

The results show that almost every variable is biased (Table 3). However, removing all outliers would reduce the sample size to 44 units, reducing the analysis possibilities. Therefore, the study used non-parametric methods and positional measures that are not sensitive to outlier observations.

3. RESULTS

First of all, what should be noted are the generally poor condition of hospitals in the analyzed period, which can be seen in the very low level (or even negative) of operating margin and ROA and high total debt ratio. However, the values of almost all financial indicators are improving in the analyzed period, especially in 2021 (Table 4).

Table 4. Measures of location for analyzed variables (2019–2021)

Variable	Median	Min	Max	Lower quartile	Higher quartile
OPM2019	-0,02673	-0,32518	0,2253	-0,06843	0,01098
CR2019	0,26229	0,06004	2,4214	0,19451	0,52473
DEBT2019	0,92458	0,21881	3,4838	0,68105	1,17180
EAT/Debt2019	-0,18374	-3,97275	7,3321	-0,44945	0,05382

TAT2019	1,35231	0,25382	7,4333	0,97793	1,82159
DSO2019	34,47556	2,75027	157,2237	27,99922	39,49940
ROA2019	-0,03184	-0,72432	0,5930	-0,09797	0,01026
M1 2019	0,57341	0,41423	0,7299	0,54188	0,59691
OPM2020	-0,00790	-0,35417	0,1713	-0,04441	0,01326
CR2020	0,30931	0,07754	2,2297	0,21993	0,53659
DEBT2020	0,97738	0,24463	3,8425	0,72457	1,18746
EAT/Debt2020	-0,09700	-6,68685	5,1876	-0,35952	0,06096
TAT2020	1,30741	0,30139	7,4500	0,89071	1,73647
DSO2020	38,49436	2,31497	200,5787	32,85872	44,94376
ROA2020	-0,01689	-0,55811	0,3620	-0,06157	0,00936
M1 2020	0,57783	0,41305	0,7285	0,54566	0,59612
OPM2021	0,00356	-0,27785	0,2188	-0,02715	0,03352
CR2021	0,32703	0,08532	2,3247	0,21839	0,58325
DEBT2021	0,94336	0,23300	2,9109	0,73457	1,20423
EAT/Debt2021	0,00870	-8,44872	15,0200	-0,28106	0,18346
TAT2021	1,50521	0,31959	5,1627	1,09909	1,99092
DSO2021	35,26776	4,22633	72,7115	28,73080	40,37499
ROA2021	0,00122	-0,41095	0,3776	-0,05141	0,03025
M1 2021	0,59112	0,44359	0,8436	0,56250	0,61187

Source: own study.

An increase in the median operating margin can be observed – the median value of OPM in 2021 reaches a positive value (0,00356 compared to -0,02673 in 2019). A similar improvement can be observed in the case of ROA, where median values improve (change from -0,03184 to 0,00122). At the same time, we observe an increase in liquidity (CR) and total debt ratio (DEBT). When it comes to the values of the M1 measure, we observe a slight increase in the median value of the indicator.

In 2019, the financial condition of 22 units was assessed as difficult and 22 hospitals' condition as very good. However, in 2021, only 14 hospitals were assigned to the group with financial problems, while 26 hospitals had a good and 35 - very good financial situation (Table 5).

Table 5. Hospitals' financial condition (2019–2021) interpretation based on the values from 2019

2019			
Financial condition	**Range**	**Number of hospitals**	**Median**
Difficult	0 - 0,541961	22	0,515281
Poor	0,541961- 0,573414	21	0,561105
Good	0,573414 - 0,59669	21	0,58242
Very good	higher than 0,59669	22	0,613052
2020			
Financial condition	**Range**	**Number of hospitals**	**Median**
Difficult	0 - 0,541961	20	0,492868
Poor	0,541961- 0,573414	20	0,557999
Good	0,573414 - 0,59669	26	0,586737
Very good	higher than 0,59669	20	0,610375
2021			
Financial condition	**Range**	**Number of hospitals**	**Median**
Difficult	0 - 0,541961	14	0,522511
Poor	0,541961- 0,573414	11	0,559037
Good	0,573414 - 0,59669	26	0,58632
Very good	higher than 0,59669	35	0,616549

Source: own study.

The results of the Kruskal-Wallis test confirm the statistical significance of the difference between the financial situation of hospitals in 2021 and their condition in 2020 and 2019 (Table 6). The overall financial condition of hospitals in 2021 was better than in 2019 and 2020.

Table 6. Kruskal-Wallis test for M1

	Mean	**Standard deviation**	**Min**	**Max**	**Range**	**Standard Error**	**Inter-quartile range**
YEAR2019	0,52	0,04	0,39	0,65	0,25	0	0,04
YEAR2020	0,52	0,05	0,36	0,67	0,3	0	0,04
YEAR2021	0,54	0,05	0,39	0,77	0,38	0,01	0,04
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 9.1864, df = 2, p-value = 0.01012							

p-value	YEAR2019	YEAR2020	
YEAR2020	0,841	-	
YEAR2021	0,017	0,017	

Source: own study.

Similarly, we can confirm the improvement in the value of the operating margin, EAT to debt ratio and ROA – the differences between 2021 and 2020 and 2019 are statistically significant – in the case of ROA, only the difference between 2021 and 2019 is statistically significant (Tables 7–9).

Table 7. Kruskal-Wallis test for OPM

	Mean	**Standard deviation**	**Min**	**Max**	**Range**	**Standard Error**	**Inter-quartile range**
YEAR2019	-0,03	0,07	-0,33	0,23	0,55	0,01	0,08
YEAR2020	-0,02	0,08	-0,35	0,17	0,53	0,01	0,05
YEAR2021	0	0,07	-0,28	0,22	0,5	0,01	0,06
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 12.245. df = 2. p-value = 0.002193							
p-value	YEAR2019	YEAR2020					
YEAR2020	0,1603	-					
YEAR2021	0,0014***	0,0628*					

Source: own study.

Table 8. Kruskal-Wallis test for EAT/Debt

	Mean	**Standard deviation**	**Min**	**Max**	**Range**	**Standard Error**	**Inter-quartile range**
YEAR2019	-0,22	1,07	-3,97	7,33	11,3	0,12	0,5
YEAR2020	-0,16	1,18	-6,69	5,19	11,87	0,13	0,41
YEAR2021	0,2	2,63	-8,45	15,02	23,47	0,28	0,45
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 9.5051, df = 2, p-value = 0.00863							
p-value	YEAR2019	YEAR2020					
YEAR2020	0,2032	-					
YEAR2021	0,0073***	0,0982*					

Source: own study.

Table 9. Kruskal-Wallis test for ROA

	Mean	Standard deviation	Min	Max	Range	Standard Error	Inter-quartile range
YEAR2019	-0,05	0,15	-0,72	0,59	1,32	0,02	0,11
YEAR2020	-0,04	0,12	-0,56	0,36	0,92	0,01	0,07
YEAR2021	-0,01	0,12	-0,41	0,38	0,79	0,01	0,08
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 7.9769, df = 2, p-value = 0.01853							
p-value	YEAR2019	YEAR2020					
YEAR2020	0,270	-					
YEAR2021	0,015**	0,136					

Source: own study.

We also observe a shortening of the cash conversion cycle (DSO) in the hospitals studied. The difference is statistically significant between 2021 and 2020 (Table 10).

Table 10. Kruskal-Wallis test for DSO

	Mean	Standard deviation	Min	Max	Range	Standard Error	Inter-quartile range
YEAR2019	37,17	18,45	2,75	157,22	154,47	1,99	11,36
YEAR2020	41,58	21,09	2,31	200,58	198,26	2,27	11,81
YEAR2021	35,82	11,6	4,23	72,71	68,49	1,25	11,12
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 11.014, df = 2, p-value = 0.004059							
p-value	YEAR2019	YEAR2020					
YEAR2020	0,0071	-					
YEAR2021	0,7144	0,0071***					

Source: own study.

At the same time, the statistical significance of the differences in liquidity (CR), debt (DEBT) and operating revenue to total assets (TAT) ratios was not confirmed (Tables 11–13).

Table 11. Kruskal-Wallis test for CR

	Mean	Standard deviation	Min	Max	Range	Standard Error	Inter-quartile range
YEAR2019	0,44	0,44	0,06	2,42	2,36	0,05	0,34
YEAR2020	0,46	0,41	0,08	2,23	2,15	0,04	0,32
YEAR2021	0,47	0,39	0,09	2,32	2,24	0,04	0,37
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 2.0936, df = 2, p-value = 0.3511							

Source: own study.

Table 12. Kruskal-Wallis test for DEBT

	Mean	Standard deviation	Min	Max	Range	Standard Error	Inter-quartile range
YEAR2019	1,02	0,55	0,22	3,48	3,26	0,06	0,48
YEAR2020	1,05	0,55	0,24	3,84	3,6	0,06	0,45
YEAR2021	1,05	0,53	0,23	2,91	2,68	0,06	0,44
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 2.0936, df = 2, p-value = 0.3511							

Source: own study.

Table 13. Kruskal-Wallis test for TAT

	Mean	Standard deviation	Min	Max	Range	Standard Error	Inter-quartile range
YEAR2019	1,55	1	0,25	7,43	7,18	0,11	0,79
YEAR2020	1,51	0,99	0,3	7,45	7,15	0,11	0,83
YEAR2021	1,7	0,92	0,32	5,16	4,84	0,1	0,88
Pairwise comparisons using the Wilcoxon rank sum test with continuity correction							
Kruskal-Wallis chi-squared = 4.3195, df = 2, p-value = 0.1154							

Source: own study.

CONCLUSIONS

Based on the results, we can confirm that, although the condition of hospitals is still not satisfactory, it improved in 2021 (the last year of the pandemic) compared

to the period before the pandemic (2019) and in its first year (2020). The values of many key indicators – including the operating margin and return on assets – have improved, and the differences between the average values in subsequent years are statistically significant for the examined group of hospitals. It is also confirmed by relocating hospitals to groups with better financial conditions using the synthetic M1 measure.

The results support the conclusions of Li et al. (2023), who found that California hospitals experienced a significant increase in total margin (TM) and operating margin. However, we cannot confirm the impact of the hospital's size on improving the financial situation presented in this study. Conversely, we can confirm Naruć (2022) findings, which observe the EBIT improvement, although it analyses a narrow group of infectious hospitals. The results are also in line with Wiśniewski (2023), who reports a slight improvement in financial condition, mainly profitability, during the pandemic, generally due to additional funding.

As the literature review shows, the research results are very inconsistent, although the findings that present the deterioration of the financial situation during the pandemic are dominant. The change in the condition of hospitals during the pandemic largely depended on the reaction of public authorities – in Poland, as in many European countries – hospitals received additional funding with a lower volume of services provided. It can, therefore, be considered that this is a crucial factor influencing the observed improvement.

DISCLOSURE STATEMENT

The authors report no conflicts of interest.

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HEALTH PROMOTION IN SCHOOLS - A KEY TO IMPROVING YOUNG PEOPLE'S HEALTH

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ABSTRACT

The purpose of the article. The presented research aims to analyze the impact of health education on students' attitudes towards taking care of their health, the health of other people and the ability to create a healthy environment. The paper assumes that health education is provided in schools by the applicable law. The work presents an up-to-date perspective on the complex problem of how young people perceive health.

Methodology. To verify the significance of the differences in the respondents' assessments, statistical methods (non-parametric tests) were used: the U-Mann-Whitney test and the Spearman rank correlation coefficient. The calculations were made using Statistica. The research sample included young people from upper secondary and general education schools. The author's questionnaire was used. The study was anonymous. Respondents completed the questionnaire voluntarily. The research was conducted between March and September 2023.

Results of the research. The conducted empirical analyses and the results of the surveys allowed us to achieve the goal assumed in the introduction and confirmed that health education in secondary schools influences the shaping of students' attitudes towards taking care of their health and the health of the community in which they live. By implementing health education at school –

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according to the core curriculum – students' awareness and motivation to undertake activities to improve and maintain good health is increased. Additionally, practical skills are developed to help them use the acquired knowledge in everyday life, and pro-health attitudes are formed. Health promotion is, therefore, the key to improving the health of school children, preparing them for a healthy lifestyle and making informed choices about their health and the community in which they live.

Keywords: health promotion, health education, youth perception of health, well-being.

JEL Class: I10, I31, P46.

INTRODUCTION

Several studies show that disease prevention and healthy lifestyles are critical to the population's health, and education is significantly linked to health status. There is an inextricable link – confirmed by much evidence – between health promotion, health education and health. Education has a significant impact on people's lifestyles. It can be observed that the higher the level of education, the longer life expectancy, the lower the mortality and morbidity rates and the incidence of infectious diseases, and the lower the number of risky behaviours such as alcohol abuse, smoking, unhealthy diet (Suhrcke and de Paz Nieves, 2011). It is because education allows people to gain the knowledge and skills necessary to manage their health, cope with difficulties, find a better job and thus earn more, which are also determinants of a healthy lifestyle (Woynarowska, 2013: 9; Bulska, 2017).

Previous research suggests that students' knowledge in the area of preventive health is quite limited to the impact of physical activity on health, while other aspects of health, such as mental/psychological, behavioural and social aspects, are left underestimated (Wang et al., 2014). It sets essential directions for health education in schools. As suggested by Aira et al. (2014), there is a demand for the subject in society – it not only has the potential to build young people's positive attitudes towards health issues but, what is even more important – increases pupils' health literacy. Some results suggest that school education may positively affect pupils' health behaviours in terms of harmful health habits like smoking or drinking (West et al., 2004).

Therefore, health promotion and health education are essential tasks that should be carried out at school – and schools are recognised as key environments promoting a healthy lifestyle (WHO, 1997 and 2017). School should be a place where health knowledge is formed and health promotion programs involving the whole community are implemented (Darlington et al., 2018), vital to improving children's health and well-being (Darlington et al., 2017). By intervening early and raising children in the spirit of a healthy lifestyle, the school contributes to developing health-promoting behaviours that can benefit adult life (Craigie et al., 2011; Yang et al., 2014). It has been shown that healthy children learn better, and educated children live healthier lives (Suhrcke and de Paz Nieves, 2011).

Several phenomena can be distinguished when considering the relationship between health and health education (Bulska, 2017). Health education is a health potential. At the same time, health is a potential for education. Good health enables your child to start school, attend school and achieve good academic results. Therefore, health affects the proper learning process (acquiring knowledge, acquiring new skills, involving concentration and thinking), adaptation to the school environment, establishing contacts with peers, and developing creativity, talents and interests. The rich literature shows that the

determinants of health and education are similar. In the case of the youngest, the socio-economic factors of the family, school, peers, local environment and social media have the most significant impact.

The study aims to analyze the impact of health education on the development of pupils' attitudes toward caring for their own and other people's health and the ability to create a healthy environment. It is assumed that health education is implemented in a post-primary school following legal regulations. The work gives a fresh look at the complex problem of young people's perception of their health.

The research sample includes young people from general secondary schools. Non-parametric methods were used in the data analysis (correlation of Spearman ranks and U-Mann-Whitney test). The Statistica package supports the calculations.

1. HEALTH PROMOTION AND HEALTH EDUCATION AS FACTORS SHAPING THE HEALTH OF THE POPULATION

The concept of "health promotion" is a relatively young field of knowledge because the first mention of it appeared in the 70s of the twentieth century. It was first defined at the World Health Assembly conference in 1977 (Karski, 2011: 12). At that time, it was stated that the existing methods, expenditures and resources for health protection were insufficient to improve the health of society. In this regard, the need to attach greater importance to taking care of health, and thus – to promoting good health among the public while developing primary health care – a place to which the individual turns directly when health loss was pointed out. Moreover, the structure of morbidity and mortality began to be dominated by new health threats associated with the development of civilisation, i.e. non-communicable diseases (Woźniak-Holecka, 2014).

A breakthrough in the development of health promotion was the Lalonde Report: A New Perspective on the Health of Canadians, which presents a model of health determinants valid to this day (Lalonde, 1974). This document indicates the determinants of health divided into four groups, the so-called *Marc Lalonde health fields*. Health promotion and health education are essential fields of activity of health authorities.

Health promotion is a process that aims to increase the awareness and motivation of individuals and communities to take action to improve and maintain good health. It refers to activities based on maintaining good health increasing the reserves and potential of the body (Najwyższa Izba Kontroli, 2017). Health promotion is a tool for improving the population's health, which should be understood as a process involving actions leading to an increase in personal impact on one's health. Showing a healthy lifestyle results from our conditions, individual behaviour patterns, and unique character traits. A healthy lifestyle

primarily results from promoting proper behaviour, diet, environmental protection, etc. In addition, health promotion includes many different factors affecting human health, such as the possibility of appropriate employment, food, education, a sense of security, relationships with other people, maintaining family ties, and living in a clean, natural environment. It is a concept and guidelines on strengthening health and its potential and a series of activities to teach the public how to do it properly.

The focus of health promotion is primarily on people and the conditions in which they live. Nowadays, it is believed that health promotion deals with issues that concern an individual and, above all, the whole social system, among others, education, science, politics, family, economics, politics and health care (Drzeżdżon, 2022: 74). By cross-sectoral interventions in these systems, we affect the development of the health of the whole society. What is important here is not individual but integrated action. None of the presented social systems should be omitted because there are many complicated relations between men and their entire environment. Health promotion pays attention to a man's health potential, which can be developed (Indulski et al., 2000: 82). It emphasises the importance of such determinants as routine behaviour patterns, lifestyle or interactions between the human individual and their environment.

It should also be noted that health promotion is not the same as health education. Health education can be implemented among people who are both healthy or sick and at risk of disease, while promotion is focused on prevention. The research results conducted in the United States and Western European countries confirm the effectiveness of promotional and educational activities. Research by L. Goldman and E.F. Cook shows that the decrease in mortality from coronary heart disease in the United States between 1968 and 1975 was more than 60% due to lifestyle changes and improved control of risk factors. On the other hand, improving the quality of medical services was responsible for a mortality reduction of only 1/3. In turn, the program for the prevention of ischemic heart disease implemented in Finland started in 1972 and led to a decrease in mortality of men aged 35–64 years by 65% for the whole country and by 73% for Karelia, where this program began to be implemented at the earliest (Indulski et al., 2000: 321, 339).

Health education is, therefore, an indispensable and complementary element of health promotion, and the effectiveness of both activities has a significant impact on the individual's health. The interconnectedness of health promotion tools is reflected, among other things, in the health promotion model developed by Tannahill (Sobczyk, 2020: 18), which highlights the links between critical areas for human health, i.e., health education, health protection and disease prevention.

When explaining the concept of health education, one should also mention health as the most outstanding value for every human being. Health is a superior value. It stands at the highest position in the hierarchy of all values and is a crucial element in determining the choices of the individual that make up the style and quality of life. Health education is, therefore, an element of shaping the entire human personality and should begin at the stage of early school education. It is a process in which the individual is taught to care for their health and the society in which they exist. Health education includes knowledge of environmental, social and political factors affecting health, the body's functioning, the ability to cope with difficult situations, the ability to use health care and learning to make informed decisions about one's health. It is a highly complex process involving many issues for which the family, the education system, and society are primarily responsible. From the pro-health point of view, the place of residence, lifestyle, access to health care, and genetic conditions are also important (Żmichrowska, 2019: 257).

Health education is an essential element of health promotion, as it leads to familiarisation with the objectives of health and disease prevention activities, influencing individual behaviour and attitudes and highlighting the benefits of maintaining health (Karski, 2011: 16). Classical health education was aimed at providing knowledge and striving to change behaviours and attitudes regarding health. The new approach emphasises participation in health promotion activities, especially the importance of social, political, economic and physical factors. Health education should provide reliable health information, strengthen pro-health activities, and convince and ensure influence on the creation of health social policy.

Health education is a process in which people learn to take care of their health and that of the community in which they live (Woynarowska, 2014: 11). It consists of acquiring knowledge about health, factors that increase its potential and pose a health risk, attitudes towards one's health and the health of others, skills of a healthy lifestyle, coping with new situations, and making the right decisions. Health education is a didactic and educational process in which students learn how to live to preserve and improve their health (Kędzior, 2019: 255).

Thanks to health education, it is possible to educate a person on how they should act so as not to get sick, but also on what to do to strengthen their health and that of others. It can be understood as knowledge but also beliefs, behaviours and lifestyles that aim to maintain health at a certain level by changing the way of thinking about health in the sense of promoting it and increasing the effectiveness of influence and control over one's health (Bulska, 2017: 156). It is a science-based process that provides opportunities for planned learning to enable individuals to make and act on informed health decisions (Woynarowska, 2013: 418). It is often called the process in which children and adolescents learn how to

shape an environment conducive to health and, in the event of a disease or disability, actively participate in its treatment or rehabilitation and cope with and reduce its adverse effects (Woynarowska, 2013: 418). It should be emphasised that systematic health education at school is considered the most cost-effective, long-term investment in the health of society (Jourdan et al., 2021: 295–303). The first health education programs in schools focused on solving physical health problems. Nowadays, however, it is believed that different goals should be considered – depending on the needs of a given group. Human knowledge does not always translate into actions beneficial to health. Thus, the main goal of health education in school should be to help students (Bulska, 2017: 157):

- learn about yourself, that is, getting to know yourself, your development, identifying and solving your health problems;
- understand what health is, how to take care of it and why;
- develop a sense of responsibility for one's health and that of others;
- strengthen self-esteem and confidence in one's abilities;
- develop personal and social skills conducive to well-being and positive adaptation to the challenges of everyday life;
- prepare to participate in health activities, creating a healthy environment at school, home, work, and local community.

Childhood and youth are the most critical periods when lifestyle and health behaviours are formed. Their quality is primarily influenced by the health behaviours of adults (especially parents), peer groups, social media and school (Driessen-Willems et al., 2023: 1–18). Therefore, various factors shaping health behaviours can be distinguished, e.g., predisposing factors, which may refer to attitudes, values and beliefs, knowledge and beliefs, and strengthening factors. They are also defined as moral norms, which are positive consequences of behaviour when socially approved as well as also enabling factors relating to the environmental determinants of health. These factors include health care services' availability and ownership or the local government's involvement in health matters (Bulska, 2017: 158). That way, upbringing and socialisation play a unique role in forming a young person's health behaviours.

Health education is a critical element of health promotion. It is about providing the information and skills necessary to make informed health decisions. Health education can take place in various forms, such as lessons at school, workshops, social campaigns, educational materials or social media. However, this information must be accessible, understandable and adapted to different age and cultural groups.

2. HEALTH PROMOTION AND HEALTH EDUCATION IN SECONDARY SCHOOLS IN POLAND

The requirements for health education in general upper secondary schools and technical secondary schools are regulated by the Regulation of the Minister of National Education of 30 January, 2018 on the core curriculum for public education[1] and cover various subjects (Rogacka, 2019: 3). The content of health education appears at the very beginning, where it is written that: *"An important task of the school is also health education, the aim of which is to develop in students an attitude of caring for their own and other people's health and the ability to create a healthy environment"* (MEN Regulation, 2018: 4). The appendix also emphasises the importance of health education for students with the words: *"Health education is vital, which will consistently and skilfully contribute to the improvement of the health condition of the society and the economic well-being of the state"* (MEN Regulation, 2018: 5). Health education provision appears in the education for safety, where the principles of first aid are mentioned due to the highest probability of using these skills in practice. The regulation emphasises that *"students should be introduced to care for their safety and that of others, indicating how they can get help from trustworthy people and emergency services"* (MEN Regulation, 2018: 22). Education for safety prepares students theoretically and practically for proper behaviour and appropriate reactions under challenging situations posing a threat to health and life (Rogacka, 2019: 37). The most widely described is health education in the case of the subject of physical education, in point 3 of the objectives of education (general requirements): *"Consolidation of the ability to apply in everyday life the principles conducive to maintaining physical, mental and social health, taking into account different periods of life and the specificity of the profession"* (MEN Regulation, 2018: 307).

Also, in the teaching content (specific requirements): *"I. Physical development and fitness. In terms of knowledge. The student: 1) explains the relationship between physical fitness and health and well-being; (...) In terms of skills. The student: 1) performs a self-assessment of physical fitness against the background of individual needs and health norms for the age category;(...)"* (MEN Regulation, 2018: 307). This thematic block emphasises the importance of physical development and fitness in health, not the grade given. It highlights the need to use various forms of activity that allow one to make individual choices for one's health, considering future family and professional roles. The thematic block, Health Education, contains content on health and its diagnosis in the context of counteracting civilisation and occupational diseases (MEN Regulation, 2018: 307). Combining the content of this block with the implementation of social

[1] Journal of Laws of March 2, 2018, item 467.

competencies is conducive to developing a sense of responsibility for one's health and that of other people, strengthening self-esteem and confidence in one's abilities (Rogacka, 2019: 36). "*IV. Health education.1. In terms of knowledge. The student: 1) explains what responsibility for one's own health and that of others means; 2) explains the relationship between nutrition and hydration and physical exercise and the type of work; 3) explains where to look for reliable health information and critically analyses media information in this area (trends, fashions, diets, eating patterns);4) lists civilisation diseases caused by lack of exercise, inadequate nutrition, in particular cardiovascular diseases, musculoskeletal system diseases and obesity, and discusses ways to prevent them; 5) explains the relationship between professional sport and sport for all and health, including the problem of doping; 6) explains why health is a value for man and a resource for society and what care for health in different periods of life is all about; 7) discusses the principles of rational time management and adaptation of the form of active recreation to the type of professional work and the period of life; 8) explains what self-examination and self-control of health are all about and why it is necessary to undergo preventive examinations throughout life; 9) discusses the causes and effects of stereotypes and stigmatisation of people with disabilities, mentally ill and discriminated against; 10) discusses the health and social harms associated with smoking, alcohol abuse and the use of other psychoactive substances, explains why and how to resist pressure and persuasion to use psychoactive substances and other risky behaviours. 2. In terms of skills. The student: 1) develops an individual, one-day nutrition plan, taking into account the energy balance and following the health training plan; 2) develops a project on selected health issues and indicates ways to gain allies and project participants at school, home or in the local community; 3) selects ways to reduce excessive stress and deal with it constructively; 4) develops and performs a set of shaping and compensatory exercises in the field of functional training, with particular emphasis on the prevention of back pain and the type of professional work. V. Social competencies. The student: 1) explains how to work on oneself to increase self-confidence, self-esteem and decision-making skills; 2) explains how to constructively give and receive positive and negative feedback and how to deal with criticism; 3) acts as an organiser and competitor; referee and fan in sports and recreational events; undertake individual and team initiatives; 4) lists and interprets examples of constructive and destructive behaviour by sports fans; 5) indicates the links between the values of Olympic ethics and non-sporting life; 6) discusses the ethical implications of doping agents"* (MEN Regulation, 2018: 309–310).

The regulation places excellent emphasis on pro-health education in the case of biology by shaping the awareness of the need to take care of one's health and the health of others. It is recommended to pay special attention to the development

of health-promoting attitudes, such as rational nutrition, physical activity, attention to hygiene, undergoing periodic health examinations, skilful coping with stress, as well as to the fact that the human life span is significantly extended, which implies several aspects of biological and social human life (Rogacka, 2019: 36). It stresses that psychosocial health and preparing students for life in a rapidly changing environment are essential elements of health education. Health education content has also been incorporated into subjects such as the basics of entrepreneurship, foreign language and ethics. To sum up, universal pro-health education and promotion of a healthy lifestyle should be implemented on an ongoing basis to a vast extent in the core curriculum. In the opinion of the Ministry of Education, the content of health education teaching established in the core curriculum has a sufficiently wide and multifaceted scope and is considered at all stages of education, starting with pre-school education. Shaping health-promoting attitudes takes place in educational classes (e.g. biology, physical education, education for family life, ethics), including as part of the implementation of tasks specified in the educational and preventive programme of the school or institution, adopted by the parents' council in consultation with the teaching council **(**Puls Medycyny, 2023). In addition, the Ministry of Education informs that from the school year 2020/2021, an obligation has been introduced to implement issues related to critical social problems, such as health problems, in classes with the homeroom teacher in primary and secondary schools. As a result, many materials (e.g. in the form of scenarios) are created that support teachers in conducting attractive, science-based health classes. The condition for the effectiveness of health education at school is the integration of its content with such subjects as biology, education for family life, social studies, education for safety, ethics, physical education, chemistry, physics, music, and art (Rogacka, 2019: 35). It requires teachers to work with a school nurse or hygienist and with parents. It is essential to coordinate these activities with the educational programmes on health and prevention of risky behaviour or diseases offered to schools by various actors (Rogacka, 2019: 35).

It can be stated that the school health education process is based on three pillars: the transfer of health knowledge, the formation of practical skills that help to use the acquired knowledge in everyday life and the formation of attitudes. These three pillars interpenetrate each other, complementing each other and creating a solid foundation for effective health education. Their primary assumption is to shape the student's awareness of caring for theirs and others' health, creating a foundation for their future life.

Health education content is primarily concerned with strengthening physical and psychosocial health and includes elements of spiritual health. The content of education in the current core curriculum has been linked to the knowledge and skills that the student should acquire after graduating from a given class and

written in the language of requirements, constituting the continuation of the current approach (Rogacka, 2019: 17).

The legislature established that physical education is the leading subject in primary and secondary schools (MEN Regulation, 2018). In addition, health education content is incorporated into other school subjects (referred to in section 2.1). This recommendation obliges every teacher to implement health education. The current legal regulations present two ways of implementing health education at school:

- subject – emphasising the leading role of physical education classes and including health education in the content of other subjects;
- educational and preventive – emphasising the values of health and healthy lifestyle included in the educational and preventive program (Wolny, 2018: 19).

It is an overarching document defining activities and tasks in upbringing, health education and prevention. Health education in post-primary school is consolidating and preparing for independence and self-improvement of the student. In post-primary school, health education is an integral part of a comprehensive education program: an essential task of the school is health education, the aim of which is to develop in students an attitude of caring for their own and other people's health and the ability to create a healthy environment (MEN Regulation, 2018). In secondary school, axiological education is an essential element of health education. The education of young people is focused on highlighting the values of health and a healthy lifestyle. The main goal is to help students make responsible decisions and choices, which is extremely important in the context of contemporary threats to the health of children and adolescents, especially in mental health (Wolny, 2018: 24). Implementing the core curriculum for health education in post-primary schools should be adapted to the needs and abilities of pupils/students. The first step in a teacher's work is to diagnose students' health needs and interests (Wolny, 2018: 25). Health education as a process stretched over time requires the activity and commitment of all teachers, specialists and experts in dietetics, medicine, psychology, and prevention. Cooperation with parents is also an essential aspect of planning, implementing and evaluating classes with the participation of students.

3. RESEARCH SAMPLE AND METHODS

The research sample of the main study included high school students – a total of 582 students. Before the main study, a pilot study was carried out. The primary research was conducted among classes 1–4 students of all learning profiles.

The questionnaire contained 45 closed-ended questions. The study was anonymous. Respondents completed the questionnaire voluntarily. The survey

was conducted between March 2023 and September 2023. The questionnaire includes questions to analyse four aspects to assess:

(1) the importance of health in my school (21 questions);
(2) health attitudes in the last school year (8 questions);
(3) well-being of health at school (3 questions);
(4) self-assessment of healthy living (12 questions).

The study presented the following research hypotheses:

(1) female students were more likely to appreciate the need/importance of health education at school;
(2) assessment of the importance of health at school depends on the profile of teaching in the upper secondary school;
(3) schoolgirls are more likely to take care of their health;
(4) men feel better at school,
(5) female students are more likely to evaluate their healthy lifestyle positively.

Spearman's rank correlation coefficient estimated the relationships between the variables. The statistical significance of the differences in the respondents' answers was estimated using the U-Mann-Whitney test (Szajt, 2014: 88). The checking statistic (Z) was verified at a significance level of $\alpha = 0.05$. Statistica Package supported the calculations.

4. RESULTS

The results illustrate the respondents' opinions on the importance of health education in their schools (Table 1). The analyses show statistically significant relationships between the studied elements (Table 1). In general, it can be seen that women rate the accuracy of the following statements significantly higher than men:

- "*Do you know the difference between prevention and health promotion?"* (Z = -4,547; p = 0,000),
- *"In my school, health and well-being are considered to be an important issue*" (Z = -4,355; p = 0,000),
- *"In the classroom we deal with topics concerning our health and well-being*" (Z = -2,490; p = 0,013),
- "*What I learn about health in school encourages me to take care of my health*" (Z = -4,800; p = 0,000),
- *"The school encourages me to be physically active, not only during* PE classes (Z = -3,32697; p = 0,000),
- *"I willingly participate in PE classes"* (Z = -3,327; p = 0,001),
- *"At school they teach us how important personal hygiene is for health"* (Z = -2,043; p = 0,041),

- *"Teachers teach us to keep order in our immediate surroundings (room, house, classroom) and in the further environment"* (Z = -4,739; p = 0,000),
- *"At school they teach us rational nutrition – paying particular attention to the quality of food (fresh fruit, vegetables, brown bread, dairy products, microelements, avoid sweets"* (Z = -4,763; p = 0,000),
- *"At school there are lessons/talks on addiction prevention"* (Z = -4,750; p = 0,000),
- *"Do you think the school is developing the ability to care for students' health?"* (Z = -3,992; p = 0,000).

Men rate the accuracy of the following statements significantly higher than women:

- *"Whether health education is conducted in your school"* (Z = 3,31382; p = 0,000),
- *"During educational hours we discuss topics related to health and care for it"* (Z = 2,14384; p = 0,032),
- *"We can suggest topics about health that interest us"* (Z = 2,078; p = 0,038).

Table 1. U-Mann-Whitney test values for assessing the importance of health at school depending on the gender of respondents

Variable	Measure		
	U	***Z***	***p***
(1) Have you heard the term "healthy lifestyle" at school?	42340,50	-	1,000
(2) Do you know the difference between prevention and health promotion?	34238,00	-4,54768	0,000005
(3) Does your school offer health education?	35952,00	3,31382	0,000920
(4) Is a healthy lifestyle promoted in your school?	41453,00	0,49573	0,620085
(5) In my school, health and well-being are considered to be a significant issue	35647,50	-4,35538	0,000013
(6) In the lessons, we deal with topics related to our health and well-being	38149,00	-2,49003	0,012774
(7) During homeroom hours, we discuss topics related to health and healthcare	38255,50	2,14384	0,032047
(8) In the WDŻ lesson, we discuss topics related to health and healthcare	40317,00	1,06347	0,287568
(9) We can suggest topics about health that interest us	39867,00	2,07758	0,037749
(10) Classes on health and well-being are interesting to me	40658,50	-0,86348	0,387876
(11) What I learned about health in school encourages me to take care of my health	33102,00	-4,80086	0,000002

(12) The school encourages me to be physically active, not only during physical education classes	34863,00	-3,93059	0,000085
(13) I'm happy to participate in physical education classes	35994,50	-3,32697	0,000878
(14) In school, they teach us the importance of personal hygiene (washing hands, teeth, body, etc.) for health	38718,00	-2,04262	0,041091
(15) Teachers teach us to keep order in our immediate surroundings (room, house, classroom) and in the farther (yard, street, park, forest, etc.).	33324,50	-4,73992	0,000002
(16) At school, they teach us rational nutrition – paying special attention to the quality of food (fresh fruit, vegetables, brown bread, dairy products, micronutrients, avoid sweets (tooth decay, obesity)	33120,50	-4,76378	0,000002
(17) The school offers lessons/talks on addiction prevention (alcohol, drugs, cigarettes)	33394,50	-4,75064	0,000002
(18) Is there sex education at school (about human mental and physical needs, responsibility, HIV/AIDS, sexually transmitted diseases, etc.)?	41176,50	0,97214	0,330982
(19) Are there any activities shaping environmental awareness (e.g. workshops)?	40203,00	-1,12293	0,261469
(20) Do you think the social and physical environment of the school is conducive to the health and well-being of the students?	41028,50	-0,67927	0,496965
(21) Do you think the school develops the ability to care for students' health?	34631,50	-3,99251	0,000065

Source: own study.

Another analysis issue is interpreting the results of the U-Mann-Whitney test for assessing the importance of health at school, depending on the profile of high school education. The test values are presented in Table 2.

In this case (Table 2), students of the mathematical-physical profile rate the accuracy of the following statements significantly higher than those of the biology-chemistry profile (3,4,5,7, 10,12,15,18). On the other hand, the following statements were rated lower:

- *"Do you know the difference between prevention and health promotion?"* (Z = 3,684; p = 0,000);
- "*In the lessons, we deal with topics concerning our health and well-being*" (Z = 2,929; p = 0,003);
- *"We can suggest topics about health that interest us"* (Z = 7,530; p = 0,000);
- *"What I learn about health in school encourages me to take care of my health"* (Z = 3,223; p = 0,001);
- *"I like to participate in PE classes"* (Z = 7,740; p = 0,000).

What is more, students of the mathematical-physical profile rate the accuracy of the following statements significantly higher than those of the mathematical-geographical profile: 2,4,5,7,10,15,18, and lower: 9. In addition, students of the mathematics and physics profile rate the accuracy of the following statements significantly higher than students of the IB profile: 2,5,11,15,17,21 and lower: 3.9.

Table 2. U-Mann-Whitney test values for assessing the importance of health at school depending on the teaching profile

Variable	mathematical-physical profile/ biological-chemical profile		mathematical-physical profile/ mathematical-geographical profile		mathematical-physical profile / IB	
	Measure		Measure		Measure	
	Z	*p*	*Z*	*p*	*Z*	*p*
(1) Have you heard the term "healthy lifestyle" at school?	-	-	-	-	-	-
(2) Do you know the difference between prevention and health promotion?	3,684	0,000	-3,714	0,000	-5,749	0,000
(3) Does your school offer health education?	-7,993	0,000	0,811	0,418	4,009	0,000
(4) Is a healthy lifestyle promoted in your school?	-7,954	0,000	-2,681	0,007	0,775	0,439
(5) In my school, health and well-being are considered to be a significant issue	-7,492	0,000	-8,247	0,000	-6,485	0,000
(6) In the lessons, we deal with topics related to our health and well-being	2,929	0,003	-1,581	0,114	-1,793	0,073
(7) During homeroom hours, we discuss topics related to health and healthcare	-7,091	0,000	-3,258	0,001	1,700	0,089
(8) In the WDŻ lesson, we discuss topics related to health and healthcare	-0,568	0,570	-0,435	0,664	0,891	0,373
(9) We can suggest topics about health that interest us	7,530	0,000	6,043	0,000	2,868	0,004
(10) Classes on health and well-being are interesting to me	-8,575	0,000	-5,837	0,000	0,047	0,963
(11) What I learned about health in school encourages me to take care of my health	3,223	0,001	-3,259	0,001	-3,033	0,002
(12) The school encourages me to be physically active, not only during physical education classes	-2,764	0,006	-8,516	0,000	1,019	0,308
(13) I'm happy to participate in physical education classes	7,740	0,000	0,367	0,713	-1,976	0,048
(14) In school, they teach us the importance of personal hygiene (washing hands, teeth, body, etc.) for health	7,078	0,000	-2,189	0,029	-0,025	0,980

(15) Teachers teach us to keep order in our immediate surroundings (room, house, classroom) and in the farther (yard, street, park, forest, etc.).	-3,528	0,000	-4,671	0,000	-7,173	0,000
(16) At school, they teach us rational nutrition – paying special attention to the quality of food (fresh fruit, vegetables, brown bread, dairy products, micronutrients, avoid sweets (tooth decay, obesity)	-1,930	0,054	-7,083	0,000	-1,287	0,198
(17) The school offers lessons/talks on addiction prevention (alcohol, drugs, cigarettes)	0,326	0,744	-4,527	0,000	-2,478	0,013
(18) Is there sex education at school (about human mental and physical needs, responsibility, HIV/AIDS, sexually transmitted diseases, etc.)?	-5,014	0,000	-2,181	0,029	-0,664	0,507
(19) Are there any activities shaping environmental awareness (e.g. workshops)?	0,775	0,438	-0,213	0,831	1,382	0,167
(20) Do you think the social and physical environment of the school is conducive to the health and well-being of the students?	-1,499	0,134	-2,516	0,012	0,248	0,804
(21) Do you think the school develops the ability to care for students' health?	1,113	0,266	-5,749	0,000	-2,281	0,023

Source: own study.

The Spearman rank correlation coefficient between age and respondents' answers to questions was calculated to deepen the analysis. The test results are shown in Table 3.

Table 3. Spearman's correlation coefficients and their significance in relation to the correlation between age and answers to questions

Variable	R	$t_{(N-2)}$	p
(1) Have you heard the term "healthy lifestyle" at school?	-	-	-
(2) Do you know the difference between prevention and health promotion?	0,243	6,044	0,000
(3) Does your school offer health education?	-0,150	-3,654	0,000
(4) Is a healthy lifestyle promoted in your school?	-0,098	-2,368	0,018
(5) In my school, health and well-being are considered to be a significant issue	0,129	3,125	0,002
(6) In the lessons, we deal with topics related to our health and well-being	-0,017	-0,410	0,682
(7) During homeroom hours, we discuss topics related to health and healthcare	0,048	1,163	0,245

(8) In the WDŻ lesson, we discuss topics related to health and healthcare	-0,028	-0,666	0,505
(9) We can suggest topics about health that interest us	0,004	0,096	0,924
(10) Classes on health and well-being are interesting to me	0,069	1,674	0,095
(11) What I learned about health in school encourages me to take care of my health	0,029	0,689	0,491
(12) The school encourages me to be physically active, not only during physical education classes	0,147	3,578	0,000
(13) I'm happy to participate in physical education classes	0,097	2,351	0,019
(14) In school, they teach us the importance of personal hygiene (washing hands, teeth, body, etc.) for health	0,164	4,009	0,000
(15) Teachers teach us to keep order in our immediate surroundings (room, house, classroom) and in the farther (yard, street, park, forest, etc.).	0,045	1,092	0,275
(16) At school, they teach us rational nutrition – paying special attention to the quality of food (fresh fruit, vegetables, brown bread, dairy products, micronutrients, avoid sweets (tooth decay, obesity)	0,031	0,745	0,456
(17) The school offers lessons/talks on addiction prevention (alcohol, drugs, cigarettes)	-0,021	-0,514	0,608
(18) Is there sex education at school (about human mental and physical needs, responsibility, HIV/AIDS, sexually transmitted diseases, etc.)?	0,057	1,384	0,167
(19) Are there any activities shaping environmental awareness (e.g. workshops)?	0,080	1,939	0,053
(20) Do you think the social and physical environment of the school is conducive to the health and well-being of the students?	-0,008	-0,205	0,838
(21) Do you think the school develops the ability to care for students' health?	0,093	2,255	0,025

Source: own study.

The results of the Spearman test showed that students understand the importance of prevention and health promotion and know the difference between their importance (R=0,243; p=0,000). They also confirmed that health and well-being are essential at school (R=0,129; p=0,002). In addition, the school encourages students to be physically active (R=0,147; p=0,000), and students are happy to participate in these activities (R=0,097; p=0,019). Students agree that "in school, they teach us the importance of personal hygiene (washing hands, teeth, body, etc.) for health" (R=0,164; p=0,000). Young people also agree that school improves their ability to care for their health (R=0,093; p=0,025).

CONCLUSIONS

The conducted analyses confirmed the existence of significant differences in students' assessments of health education and health promotion at school. Most students approved that they try to use what they learn at school in the field of a healthy lifestyle later in life and their daily routine, thanks to the knowledge gained at school. They develop the ability to take better care of their health and the health of the environment in which they live. Therefore, it can be concluded that systematically implemented health promotion becomes a practical key to improving young people's health.

Health is an intrinsic condition for school achievements, economic performance and a good quality of life. Equipping students with knowledge, skills, and the right attitudes towards health gives them a chance for a better, healthier life. Health education and promotion are essential to upbringing and serving the student's development. Putting into practice the activities of health education and health promotion is becoming the key to improving the health of young people. It is absolutely necessary to provide them with knowledge about health, healthy lifestyle, diseases and prevention and to shape practical skills that help to use the acquired knowledge in everyday life. Teachers are undoubtedly the creators of school health. They should encourage and inspire students to live healthy lifestyles, make healthy choices, and be responsible for their own health and that of the community in which they live.

In conclusion, it should be emphasised that systematically implemented health education at school, combined with the intensification of activities aimed at promoting health, constitutes adequate protection for the health of students and is in line with the priorities of strengthening health promoted by the WHO and the public health policy expressed in the National Health Programme for 2021–2025. There is a lot of evidence that properly implemented health education and health promotion in schools becomes effective, gives health benefits and is considered the most cost-effective, long-term investment in the health of society.

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