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**IMPACT OF UNEMPLOYMENT ON THE MENTAL HEALTH: PRE AND AMIDST  
COVID COMPARISON**

Master's thesis

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We have written this master's thesis independently. All viewpoints of other authors, literary sources and data from elsewhere used for writing this paper have been referenced.

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## Resümee

### **TÖÖTUSE MÕJU VANEMAEALISTE VAIMSELE TERVISELE: COVID-EELNE JA - AEGNE VÕRDLUS**

Magistritöös analüüsitakse Covid-19 põhjustatud tööpuuduse seost 50-aastaste ja vanemate elanike vaimse tervise halvenemisega 27 Euroopa riigis ja Iisraelis. Analüüs hõlmab SHARE uuringu andmeid aastatest 2017 ja 2021. Töö uudsus seisneb eelkõige laiapõhjalises valimis, mida varasemates sarnastes töödes pole kasutatud. Kasutades diff-diff hinnangut logit regressioonis ja probit regressiooni tulemuste robustsuse kontrollimiseks leiti, et tööpuudusel on statistiliselt oluline negatiivne mõju vanemaealiste vaimsele tervisele. Lisaks süveneb see mõju pandeemia olukorras.

# **1. INTRODUCTION**

## **1.1. Background**

Many infectious diseases pose big problems for modern societies, even though epidemiology has come a long way in the last decade. As the disease spreads, so did the pandemic. People in both developing and developed countries are affected by the pandemic. As of December 2019, COVID-19 has spread all over the world from Wuhan, a city in the Hubei province of China. COVID-19 has become a big problem for the world's population and economy. Many macroeconomic indicators went down when there was an outbreak of disease or an economic crisis. When it comes to the economy, epidemics may have a big impact that goes far beyond health and death. Lots of industries, such as travel, tourism, supply chains, stock markets, and the oil sector influenced by the detrimental effects of a pandemic. Because of this epidemic, there has been a big change in the way people work and trade all over the world.

There have been numerous researches in the scope of analyzing the impact of economic recessions on people's health. Building on the literature the main purpose of this research is to study how Covid-19 induced unemployment is affecting the mental health deterioration of the elderly population across Europe and Israel. To see the effect of the pandemic the data has been taken from two periods, namely before and after the pandemic. The results of the analysis show that unemployment negatively impacts mental health, and the COVID-19 had a key role in exacerbating the mental health problems caused by pandemic-induced unemployment.

Unemployment is well-known to have a negative influence on a person's physical and psychological well-being, especially when it lasts for an extended period. Furthermore, macroeconomic crises amplify the link between unemployment and poor health, particularly aggregate health indices. As a result, chronic and widespread unemployment is a major public

health issue. Therefore, the goal of this research is to see whether there is a link between the coronavirus epidemic and individuals' mental health deterioration as a consequence of being unemployed.

Deterioration of mental health is considered a response variable in this research. As a result, the predictors for mental health include unemployment, COVID-19, and COVID-19 interaction with unemployment as the difference in difference estimator. Among other things, age, gender, and location are all control variables. Difference-in-difference methodologies are used by the researcher to examine the effects of Covid-19 on adults over the age of 50 in 27 European nations and Israel. For this reason, the current study employs logistic and probit regression to estimate the probability and odds ratios for the impact of unemployment on mental health since the dependent variable is binary with values of 0 and 1.

The study brings a novelty into the literature by specifically analyzing the consequences of unemployment increased by the presence of a pandemic. Additionally, to the authors' knowledge, it is the first study encompassing a wide span of countries across Europe and Israel. By covering these gaps our results give crucial information to help for developing economic and social policies to dwindle the effect of the pandemic on the mental health of the most susceptible population segment – people over 50 years old.

## **1.2. Research Questions**

The study aims to evaluate the intervention of COVID-19 in enhancing the impact of unemployment on mental health deterioration. Thus, the study presents the following research questions:

1. Does unemployment deteriorate the mental health of elderly people?

2. Does the COVID-19 significantly enhance the impact of unemployment on the deterioration of mental health?

### **1.3. Research Objectives**

Following the research questions, the study shall evaluate the impact of unemployment on mental health, along with the role or effect COVID-19 play in the proposed relationship. The study proposes the following research objectives:

1. To test the impact of unemployment on the mental health of the elderly population.
2. To evaluate the change in the effect of unemployment on the mental health attributed to COVID-19.

### **1.4. Problem Statement**

The negative impacts of unemployment on mental health are well-acknowledged in the scientific literature. Unemployment may harm one's mental health. The possible reasons for unemployment having a negative impact on one's mental health are the loss of social standing, self-esteem, physical activity, and the chance to utilize one's abilities (Shrivastava et al., 2019; Cortès-Franch et al., 2018; Reynolds and Altman, 2018). Individual social contexts, which are primarily determined by familial roles and socioeconomic status, are likely to mitigate the negative effects of unemployment on mental health. (Kim et al., 2018; Varanka-Ruuska et al., 2018).

Because unemployment and working circumstances are important socioeconomic determinants of health, the researchers focused on the function of unemployment as a mediator. Priority has been given to the research of risk factors associated with occupational status and health, rather than structural and social elements in the labor market (Mousteri et al., 2018). According to SHARE

survey data, unemployment (especially long-term unemployment) has a detrimental influence on both one's physical and emotional well-being (Moustgaard et al., 2019). Our main purpose, however, is to examine the association between unemployment and health in both the pre-and post-pandemic periods. Urbanos-Garrido and Lopez-Valcarcel (2015) investigated the impact of unemployment on mental health induced by the economic crisis in Spain and found a significant negative effect on the mental health attributed to an economic crisis.

Section one elaborates on the background, research question, research objectives, and the problem statement for the present study. A detailed review of the literature is presented in Section two. Section three discussed the data, sources, analytical approaches, and variables taken into account. Section four presents the results whereas, the implications are discussed in Section five. Finally, the conclusion has been drawn.

**Research clarification code: S180**



## **2. LITERATURE REVIEW**

The present section summarizes the most relevant studies in the pool to introduce the grounds of research. It additionally discusses the general agreement of scholars on the economic causes and definitions of the mental health, unemployment, and crises situation and then explains the theoretical relationships between the proposed variables.

### **2.1. Unemployment and Mental Health**

Unemployment refers to those who can work but are unable to do so. This category includes those who are ready to be employed yet do not have suitable employment. Unemployment is one of the finest indicators of a country's economic health since it is simple to compute by dividing the number of unemployed but economically active people by the total number of the labor force.

There are long-term consequences of unemployment, such as an impact on mental health and subjective well-being, that go beyond the individual. Interpersonal impacts of unemployment affect the social well-being of unemployed people, which are social processes that go unobserved but have an influence (Gjuntoli et al., 2015). Long-term unemployment, in particular, has been shown in several studies to have harmful effects on health. Unemployed people tend to be in worse health than those who are employed (Van Hal, 2015; Ofiffe and Han, 2014; Pelzer et al., 2014). Based on existing empirical data, long-term unemployment has a detrimental impact on health and mortality risk (Minelli et al., 2014). The recession, which started in 2008, had a negative influence on mental health, according to Uutela, 2010. There is considerable evidence that the European financial crisis has had a mixed effect on health outcomes, with suicide and mental health being the most severely affected (Parmar et al., 2016). Depressive symptoms increased stress, and a worse feeling of well-being was more common among unemployed people than among working

people (Kim et al., 2013; Ollife and Han, 2014; Pelzer et al., 2014). Unemployment was related to an elevated death risk in early and middle careers, but not in late careers, but also with poor self-rated health, a considerably increased cardiovascular risk, and a significantly increased all-cause mortality risk (Roelfs et al., 2011; Giatti et al., 2010; Noelke and Avendano, 2015). Physical and mental health declines are greater among people who are jobless for a long duration than those who are jobless for a short length of time. Men and women are at greater risk of dying from any cause when they have been unemployed for an extended period (Garcy and Vagero, 2012). Long-term unemployed people have a more than twofold greater risk of mental disease, including depression and anxiety disorders, when compared to those who are employed. In comparison to the overall population, their mortality rate is 1.6 times higher. Both mental health and unemployment seem to go hand in hand (Herbig et al., 2013).

The meta-analysis found that both selection and causation effects play a role in the mental health of unemployed people: Unemployed people are more distressed than employed people, according to a range of researchers the psychological distress symptoms include mixed symptoms of distress, depression, and anxiety, psychosomatic symptoms, subjective well-being, self-esteem, and life satisfaction (Paul and Moser, 2009; Jefferis et al., 2011).

Van der Meer (2014) utilized the European Social Survey (ESS), which included measures of stress, fulfillment, life satisfaction, and personal pleasure, to demonstrate a negative relationship between unemployment and subjective well-being. Daly and Delaney (2013) examined the relationship between a person's mental well-being at 50 and the length of time they had been jobless across 34 years in a sample of 50 British individuals. According to their results, psychological scarring caused by unemployment has a detrimental influence on adult employees' well-being. Reneflot and Evensen (2014) discovered that young jobless people had a greater risk

of getting Parkinson's disease, independent of their baseline mental health or other confounding variables. Then, de Munter, Hemmingsson, and Rasmussen (2017) discovered the long-term effects of youth unemployment on their mental health, whereas Taht et al. (2019) discovered that unemployment had a negative impact on the cognitive (life satisfaction) and emotional (negative affect) well-being of young Europeans. People who have been out of work for an extended period are more likely to suffer from mental illness than those who are now employed or have just lost their employment (Herbig, Dragano, and Angerer, 2013).

## **2.2. COVID-19 and Unemployment**

The limitations enforced by several countries in reaction to the epidemic have had a variety of negative repercussions on people's daily life (Product, 2020). At the start of the crisis, there was a widespread belief that government policy was too burdensome: it imposed a slew of comprehensive restrictions, including a prohibition on gathering in public places and a requirement that residents leave their homes only when necessary (such as to work within prescribed limits, purchase food or medicine, receive medical treatment, or perform other essential activities). Over 60 million individuals have claimed unemployment benefits throughout the epidemic, making unemployment insurance a critical component of the COVID-19 response and a way to overcome mental stress. Currently, every educational institution in the country is available online (US Department of Labor, 2020).

Because of the economic crisis, over a thousand companies (excluding those categorized as "vital," such as grocery stores or pharmacies) were forced to shut down immediately (Carroll et al., 2020). While non-essential industries were allowed to continue, only a restricted number of people were allowed to work in them. It is possible that the employees' worries about contracting COVID-19

at work and infecting their families led to some of the first pandemic's voluntary layoffs, while others were forced out by their parents (Product, 2020). In wake of safeguarding their children's safety and well-being educational institutions shut their doors. The financial crisis is having a direct impact on the lives of young people. New research predicts that employment insurance will have a significant influence on rising consumer spending and lowering poverty (Carroll et al., 2020). Job searchers above the age of 35 have an advantage over those under the age of 35. Many of them had a decreased chance of returning to their previous employment since they worked in sectors most impacted by the limitations, such as restaurants, bars, event and entertainment services, sales, teaching, and other non-professional activities in the education sector.

Europe's economy could go into a long-term slump because of the current epidemic, Wren-Lewis et al. (2020) say COVID-19 is bad for economic growth, jobs, inflation, and manufacturing prices. They say that people who work for themselves in the United Kingdom are most at risk of getting this pandemic. According to their research, most self-employed people were affected by the current pandemic's long period of unemployment. Young people and people who only went to high school are more likely to lose their jobs.

### **2.3. Theoretical Framework (Middle Range and Social Identity Theories)**

According to Ezzy (1993), who proposed a middle-range theory in which changing jobs is seen as a status passage when a person progresses up the social ladder, they may experience changes in their sense of identity, sense of self, and behavior. According to Ezzy (1993), changing one's viewpoint is a continuous process. For example, "integrative passages" such as marriage, which are typically viewed positively, involve "integration into a delineated new status through a ceremonially specified process," while "divestment passages," which are typically viewed

negatively and involve "separation from a status and frequently contain extended transitional phases of uncertain duration," are on the opposite end of the spectrum. Divesting or integrating are only two ends of a continuum, and recognizing them as such allows for the development of intermediate forms of transit that account for the tension that often emerges between the nature of the movement and its direction, whether upward or downward. According to Ezzy, "integration into deviant statuses such as criminal or certified insane indicates the acquisition of an identity rather than the loss of socially acceptable statuses", "but such integrations are not commonly regarded as social growth". According to Ezzy (1993), when someone loses their job, this is an example of a transition. This involves seeing job loss as a three-stage process that comprises a break, a brief period of unemployment, and maybe an integrative shift into a different function or position.

Status passages contain a variety of characteristics; these are the elements of the passage as they are perceived by humans. People's mental health and well-being are influenced in one of two ways when their position changes: favorably or adversely. Ezzy's framework is similar to the 'employment continuum' approach in this regard because it recognizes that different types of job loss and pathways into and out of unemployment (such as unemployment due to illness, retirement, leaving school, etc.) can lead to various types of status passage and present themselves. Unemployed people (those who are out of work but still seeking a job) and those who are not yet retired (those who are not yet retired) have considerably different degrees of hedonic and eudaimonic well-being (Welch et al., 2011). If, as Ezzy (1993) contends, the social roles connected with a person's status passages are crucial in developing their identities, then this is an important aspect of status passages. All individuals whose job roles define their identities and who are unable

to find adequate alternatives after losing their jobs are at risk of suffering from the negative impacts of unemployment on their mental health and well-being.

The social identity theory of Stets and Burke (2000) investigates the phenomenon of peoples' identities in sociology and social psychology by focusing on the formation of identities in groups, rather than social roles, as in identity theory, and conceptualizing identities as peoples' awareness of belonging to a group or social category, such as "employed" or "unemployed," as opposed to a group or social category such as "unemployed." Unemployment, its meanings and interpretations, and other psychological consequences may all be linked back to social identity theory. For example, one's attitude toward the social groups to which they belong may impact one's feeling of self-worth. Accepting and benefiting from public aid is another way that social identities may enhance people's lives (Haslam et al., 2009).

Both middle range theory and social identity theory provide a sound back to the explanation for the detrimental effects of unemployment on mental health, such that the effects are induced due to crises events.

Both middle range theory and social identity theory provide a sound back to the explanation for the detrimental effects of unemployment on mental health, such that the effects are induced due to crises events. Based on the literature review and theoretical frameworks, the present study proposes the following hypotheses:

*Hypothesis 1:* Unemployment has a significant detrimental effect on mental health.

*Hypothesis 2:* The detrimental effect of unemployment on mental health gets induced by crises such as COVID-19.

### **3. METHODOLOGY**

This section gives a background about the data applied and the methodology used throughout the entire analysis. Sections 3.1 and 3.2 explain the data and its preparation respectively, while Section 3.3 examines the variables of the model. Finally, Section 3.4 exhibits the identification strategy along with the regression equation of the analysis.

#### **3.1. Data**

The data for the present study is a survey - SHARE (Survey of health, aging, and retirement in Europe) - data. SHARE was founded to better understand the long-term consequences of health, social, economic, and environmental policies on people across Europe and the rest of the globe. Between 2004 to the present, almost 140,000 people over the age of 50 were questioned in 28 European countries and Israel<sup>1</sup>. As a result, it is the biggest pan-European social science panel research database, including globally comparable longitudinal microdata on Europeans' public health and socioeconomic status (Bosang and Pronkina, 2021). The SHARE Corona Survey and the seventh wave of the SHARE Survey of Health, Ageing, and Retirement in Europe were used in this research. During the pandemic, the SHARE Corona Survey was developed to better study the impact of the pandemic on elderly people. This research focuses on the second Corona Survey, which was conducted between June and August 2021. The paper incorporates additional information about responders and establishes necessary variables via the SHARE's longitudinal component. The study considers 17,088 observations from 3,428 respondents before COVID-19 and 13,660 observations from 13,660 respondents after COVID-19 from the following 28 countries: Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece,

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<sup>1</sup> <http://www.share-project.org/home0.html>

Switzerland, Belgium, Israel, the Czech Republic, Poland, Luxembourg, Hungary, Portugal, Slovenia, Estonia, Croatia, Lithuania, Bulgaria, Cyprus, Finland, Latvia, Malta, Romania, and Slovakia.

### **3.2. Data Preparation**

The Share data set provides multiple data files for each category, thus questions extracted from different files were merged. The data was checked for the missing variables, and cases were removed with any null values. Further, Shapiro-Wilk test is applied to check whether the data is normally distributed along with skewness and kurtosis values (Royston, 1992). The results depict that the age is not normally distributed thus natural log conversion into the age variable is applied.

### **3.3. Variables**

The present study takes into account *mental health* as the dependent variable whereas *employment status* is the independent variable. In addition to this, the study includes a set of control variables including age, gender, and the region as suggested by Urbanos-Garrido and Lopez-Valcarcel (2013).

To account for the variation in the impact of unemployment on the mental health, due to COVID, the present study creates a treatment variable COVID, with wave seven as pre-COVID period (COVID=0) and Corona Survey as a COVID period (COVID=1). The description for each of the variables is provided below.

#### **3.3.1. Dependent Variable**

Mental health deterioration: *Mental health deterioration* refers to the level of stress and sadness realized by a certain individual as suggested by Urbanos-Garrido and LopezValcarcel (2013).



However, due to the inclusion of separate waves (Wave 7 and Corona Survey), the question on mental health was not available in the Corona survey, hence the researcher proxied the mental health with the status of sadness and depression as suggested by Spijker (2004). Then, opted variable is categorical and has a binary response as “Yes=1” and “No=0”.

### ***3.3.2. Independent Variable***

Unemployment: The variable on *employment* has been proxied by the employment status which is also a binary categorical variable with “Employed=0” and “Unemployed=1”.

### ***3.3.3. Control Variables***

Control Variables are the variables which are significant determinants of the dependent variable, other than the independent variables in the model. Adding control variables can provide the unique effect of the independent variable on dependent variable, in this case unemployment and the interaction of COVID-19 and unemployment on the mental health. The present study includes age, gender and region as the control variable following Urbanos-Garrido and Lopez-Valcarcel (2015). Ideally, the study also wanted to include marital status and education level as control variables. However, the obstacles by the data set hindered to do so. First, the study tried to only use data from respondents who attended both in seventh wave and Corona Survey to be able to incorporate more controls. This would allow us to use data about marital status and education level from seventh wave as proxy for the second period, Corona survey. However, it resulted in a significant loss in sample size, and we ended up just approximately 100 respondents who attended in both waves and answered questions about marital status and education level. Hence, the limitations in data made the study to continue with age, gender and region as control variables.

*Age:* Age is a continuous variable and depicts the age of the respondent in years.

*Gender:* Gender is a categorical variable with “Male=1” and “Female=2”.

*Region:* The variable region includes the countries and regions.

### **3.4. Identification Strategy**

Association between mental health and unemployment can be estimated by several methods but we are planning to apply a difference-in-difference estimator based on the SHARE data which covers people aged 50 or above from 28 countries to research the effects of unemployment attributed to Covid-19 on mental health. Thus, the analysis requires an approach that compares the effect of independent variables on the dependent variable across the waves or control and treatment groups. To assess the effect of unemployment on the mental health attributed to COVID-19 the present study uses a difference-in-difference approach as adopted by Urbanos-Garrido and Lopez Valcarcel (2013). Given the dependent variable is binary with the values of 0 and 1, the ordinary OLS would not be an appropriate approach, thus, the paper uses the logistic and probit regression to estimate the probability and odds ratio for the effect of unemployment on the mental health. Transferring the differences-in-differences identification strategy to the latent variable in non-linear models like logit and probit is the single way to address the nonlinearity problem in the model (Puhani, 2012). Thus, the paper employs logistic regressions and does the probit regression for a robustness check. The resulting regression then contains an interaction term that is the product of the group and time indicators (Puhani, 2012). Additionally, in nonlinear models with an interaction term, the treatment effect is not simply equal to the cross differences of the observed outcome. Rather it equals conditional expectations of subtraction of the cross difference of observed outcome and the cross difference of potential outcome without treatment (Puhani, 2012).

To estimate the effect of Covid-19 attributed unemployment on mental health deterioration the paper employs the following regression equation (1).

$$\begin{aligned} \text{Mental Health}_{i,t} = \beta_0 + \beta_1 \text{Unemployment}_{i,t} + \beta_2 \text{Covid}_{i,t} + \beta_3 \text{Unemployment}_{i,t} * \\ \text{Covid}_{i,t} + \beta_4 \text{Controls}_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

## 4. RESULTS

The following section is devoted to the presentation and the interpretation of the results. The estimations are performed in various specifications namely, logistic and probit models to ensure the robustness of estimates.

### 4.1. Descriptive Statistics

Table 1 presents the frequency table for the categorical variables. The results indicate that the sample includes 32.8% males and 67.16% females, in the total sample size of 17,088. Further, 61.57% of respondents were employed, whereas, 38.43% were unemployed. The employed respondents include self-employed, full-time employed, part-time employed, retired with a pension, and persons with investments. Whereas the unemployed respondents include economically active people with no job and means of earning. 70% of respondents suggest that they were not depressed or sad, whereas 30.23% responded in affirmation. The *Depression* and *Sadness* status serves as a proxy for mental health as stated in section 3, Methodology. The researcher created a dummy variable for representing before and after pandemic period by merging the data from wave 7 and the second wave of COVID-19. Thus, the pre-COVID category suggests the data from wave 7 and likewise, the post-COVID wave represents the second survey of coronavirus. The pre-COVID survey included 3,428 (20.06%) respondents where the post-COVID survey include 13,660 (79.94%) responses.

### 4.2. Correlation

The correlation matrix (Appendix E) highlights the direction and magnitude of the relationship between the two variables. Although it measures the relationship, it does not imply causation. The correlation matrix enables researchers to highlight the possible association between the

independent and dependent variables and identify multicollinearity. Multicollinearity occurs when two or more independent variables are highly correlated with each other. The presence of multicollinearity violates one of the key regression assumptions. Results in Table 4 suggest that the correlation between unemployment and mental health is 0.189 suggesting that increasing unemployment deteriorates the mental health condition. The correlation among the independent variables is less than 0.70, suggesting that the model is free of multicollinearity.

### **4.3. Logistic Regression Results**

To evaluate the proposed hypotheses the researcher has evaluated the models without control variables in model one (M1) and with control variables in model two (M2). To account for possible heteroskedasticity, the results have been run using robust standard errors, and logistic and probit regression.

Hypothesis one suggests that unemployment significantly worsens the mental health of a person. Accordingly, the results indicated in model two suggest that the odds of mental health deterioration are higher for unemployed people (OR=1.391,  $\beta=0.330$ ,  $p<.05$ ). The second hypothesis states that unemployment combined with COVID-19 significantly worsens mental health. Indeed, the results in Table 1, model two supports the hypothesis, that the interaction effect of COVID and unemployment worsen mental health such that, the odds of mental health deterioration is higher for unemployed people during the COVID-19 pandemic (OR=1.353,  $\beta=0.302$ ,  $p<.05$ ). The R-square for model one is 0.0358, suggesting that the independent variables in model one explain a 3.58% variation in mental health deterioration. The R-square for model two is 0.0467, suggesting that the independent variables in model two explain a 4.67% variation in mental health deterioration. Model two is a better fit than model one.

**Table 1. Logistic regression**

	M1 Coeff	M1 OR	M2 Coeff	M2 OR
Unemployment	.599*** (.0706)	1.820*** (.128)	.330*** (.0731)	1.391*** (.102)
COVID	-.605*** (.0582)	.546*** (.0318)	-.601*** (.0603)	.548*** (.033)
Unemployment* COVID	.244** (.0808)	1.277** (.103)	0.302*** (.0811)	1.353*** (.11)
Age			1.380*** (.159)	3.973*** (.631)
Gender			.472*** (.0407)	1.604*** (.0653)
Country			.00331** (.0013)	1.003** (.00128)
Constant	-.691*** (.0521)	.501*** (.0261)	-7.240*** (.671)	.000718*** (.000482)
Pseudo R Square	.0358	.0358	.0467	.0467
Observations	17,088	17,088	17,088	17,088

Notes: Standard error in parathesis.

\*\*\* Significant at the 0.01% level.

\*\* Significant at the 0.05% level.

\* Significant at the 0.1% level.

#### 4.4. Probit Regression

For further robustness checks, the results have been checked using the probit regressions (Appendix C). The results support both hypotheses. Hypothesis one suggests that unemployment significantly worsens the mental health of a person. The results in Table 4 suggest that the chances of mental health deterioration are higher for unemployed people ( $\beta=0.212$ ,  $p<0.05$ ). The second hypothesis states that unemployment combined with COVID-19 significantly worsens mental health, the results support the hypothesis ( $\beta=0.171$ ,  $p<0.05$ ). The R-square for model three is 0.0358 whereas the R-square for model four is 0.0468. The results confirm with findings in logistic regression.

## **5. LIMITATIONS, FUTURE DIRECTIONS, AND CONCLUSION**

In this section, the paper discusses limitations of the study, proposes respective future directions and finally concludes.

### **5.1. Limitations and Future Directions**

The present study has several limitations, and addressing them can direct future research. First of all, the present study has a limited geographical scope and is based on the cross-sectional data of the Share Survey with data from 28 countries including Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel, the Czech Republic, Poland, Luxembourg, Hungary, Portugal, Slovenia, Estonia, Croatia, Lithuania, Bulgaria, Cyprus, Finland, Latvia, Malta, Romania, and Slovakia. Thus, the findings of the study shall be limited and applicable to the context of these 28 countries. The present study leaves this gap for future researchers to conduct the study across other 6 continents and a large sample of global countries, mainly the members of the United Nations to understand the global effect.

Moreover, SHARE was established as a research infrastructure to better understand the effect of public health, social, economic, and environmental policies throughout a person's life cycle across Europe and beyond. Since 2004, 530,000 in-depth interviews with 140,000 persons over the age of 50 have been carried out in 28 European countries and Israel. SHARE is the biggest pan-European social science panel survey to date, making a significant contribution to social science research on public health and socioeconomic situations in Europe. The SHARE Corona Survey findings provide an in-depth examination of the health and economic consequences of COVID-19 for the risk category of older people. However, all the responses to health conditions were self-reported which again draws attention to the reliability of these answers. This concern suggests a

future direction to find an optimal assessment of health conditions for analysis as the present study uses a self-reported dependent variable – mental health deterioration.

Further, this data has a significant benefit in that it can be used to assess and compare differences between countries and across time. The main goal of the SHARE COVID-19 project is to better understand these unforeseen consequences and to develop more effective health, economic, and social policies. The paper employs only two time periods to be able to measure the difference between post and pre-pandemic. Additionally, with the current data, our objective is to strengthen healthcare systems and society's resilience to pandemics by concentrating on the most susceptible population segment: people aged 50 and older. This age range, on the other hand, causes a randomization problem in the sample. The paper leaves a gap for future researchers to analyze the young citizens or a collective pool, with samples across all age intervals.

Other than that, the present data set does not allow research on the impact of length of unemployment has on mental health deterioration during Covid-19. Researchers could also not add various covariates because of not reported – null answers to questions such as marital status and educational background. Finally, the present study only considers the Covid-19 attributed impact of unemployment on mental health deterioration whereas, there are several other channels besides unemployment that influences the mental health of the population during pandemic and crisis times. In general, this does not represent a causality issue, rather it is just a link between Covid-19 attributed unemployment and mental health deterioration. Those factors create a gap to improve on in the further research on this topic.

The study aims to build on data we have and make more comprehensive research by eliminating above mentioned limitations in the future.



## 5.2. Conclusion

Long-term unemployment is well-known to have a detrimental influence on a person's physical and psychological well-being. Another result of economic crises is an increase in the correlation between unemployment and unhealthy lifestyles, as well as general health indicators. The frequency of long-term unemployment is a serious public health concern. The study began with the objective to explain whether there is a relationship between the coronavirus pandemic-induced unemployment and the mental health experienced by older persons (50+).

The deterioration in mental health is regarded as a dependent variable in this study. As a result, we utilize unemployment to evaluate how people's mental health is faring in contrast to other factors such as COVID-19 and unemployment itself. Gender, age, and location are all control variables. Using difference-in-difference approaches, the effects of Covid-19 on persons over the age of 50 in 27 European countries and Israel were investigated. Because the dependent variable is binary, the present research used logistic and probit regression to calculate the probability and odds ratios of the impact of unemployment on mental health. The researcher discovered a relationship between pandemic-induced unemployment and declining mental health, which he believed was aggravated by the COVID-19 virus.

These findings provide robust evidence about the significant negative impact of Covid-19 attributed to unemployment. By comparing two time periods the study enables the comparison of the influence of unemployment during and before the pandemic. The results confirm an increased level of mental health issues during pandemic-originated crises. Further, the results also lead to a conclusion that the worry and uncertainty originated by crises during a pandemic could have a detrimental impact on people's health.

To conclude, our results draw attention to preventative measures to control the detrimental effects of crises and job loss on susceptible age groups in each of these countries. Monitoring the health conditions of people and providing subsidies to those who remained unemployed for the long-term because of pandemic-originated crises would increase the strength of healthcare policies throughout countries studied, leading to an achieved better life standard for people.

## APPENDICES

### Appendix A

**Table 2: Frequency Table**

Variable Name	Characteristic	Freq.	Percent	Cum.
Gender	Male	5,611	32.84	32.84
	Female	11,477	67.16	100
Employment Status	Employed	10,521	61.57	61.57
	Unemployed	6,567	38.43	100
Metal Health Deterioration - Depression and Sadness	No	11,922	69.77	69.77
	Yes	5,166	30.23	100
COVID	Pre-COVID	3,428	20.06	20.06
	Post-COVID	13,660	79.94	100

### Appendix B

**Table 3: Descriptive Statistics**

Variable Name	Obs.	Mean	Std. Dev.	Min	50%	Max
Gender	17088	0,328359	0,46963	0	0	1
Age	17088	64,48812	7,967855	50	62	100
Unemployment	17088	0,384305	0,486445	0	0	1
Mental Health Deterioation	17088	0,302317	0,459275	0	0	1
COVID-19	17088	0,799391	0,400467	0	1	1

## Appendix C

**Table 4. Probit Regression**

	<b>M3</b>	<b>M4</b>
	Coeff	Coeff
Unemployment	.372*** (.0436)	.212*** (.0451)
COVID	-.360*** (.0352)	-.355*** (.0364)
Unemployment* COVID	.135** (.0496)	.171*** (.0498)
Age		.830*** (.0958)
Gender		.282*** (.0237)
Country		.00189* (.00076)
Constant	-.430*** (-.0319)	-4.366*** (0.404)
Pseudo R Square	.0358	.0468
Observations	17,088	17,088

Notes: Standard error in parathesis.

\*\*\* Significant at the 0.01% level.

\*\* Significant at the 0.05% level.

\* Significant at the 0.1% level.

## Appendix D

**Table 5: Shapiro Wilk Test**

<b>Variable</b>	<b>Obs.</b>	<b>W</b>	<b>V</b>	<b>Z</b>	<b>Prob&gt;z</b>
Age	17,088	0.89548	820.36	18.207	0

## Appendix E

**Table 6:** *Correlation Matrix*

	Gender	Age	Unemployment	M.H.D.*	COVID	Unemployment * Covid
Gender	1					
Age	0.1405	1				
Unemployment	0.2934	0.3474	1			
M. H. D.	0.1417	0.1485	0.1896	1		
COVID	-0.0674	-0.1914	-0.1372	-0.1151	1	
Unemployment*Covid	0.2055	0.2034	0.7903	0.1174	0.3128	1

\*M.H.T. – Mental Health Deterioration

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