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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

RELATIONS BETWEEN MENTAL DISEASES, PER CAPITA INCOME AND SOME SOCIO-ECONOMIC VARIABLES: RESEARCHES ON BRICS-T COUNTRIES

MENTAL HASTALIKLAR, KİŞİ BAŞINA GELİR VE BAZI SOSYO-EKONOMİK DEĞİŞKENLER ARASINDAKİ İLİŞKİLER: BRICS-T ÜLKELERİ ÜZERİNE ARAŞTIRMALAR

Öğr. Gör. Dr. Ömer Faruk GÜLTEKİN [1]

Prof. Dr. Ömer Selçuk EMSEN [2]

ABSTRACT

Mental illnesses are one of the great social problems of the last period. Mental diseases, which are an important public health problem in the changing and developing world, can be considered as an output of the economic development process. From this point of view, the relationship between mental diseases, which is one of the outputs of the economic development process, and some socioeconomic variables in the BRICS-T countries, which have an important place in the world economy, has been investigated in the study. In this study, the effects of variables representing the level of income per capita and education, health, democracy, and income distribution on mental diseases for the period 1990-2019 were investigated with the help of the Kuznets model. Firstly, descriptive statistics, heteroscedasticity, autocorrelation, and cross-section dependency tests were applied. Secondly, GLS and Driscoll-Kraay estimation tests used in the estimation process, and it was determined that there was a U-shaped relationship between mental illnesses and per capita income in the BRICS-T country group. Konya causality test applied to determine the causality relationships between the variables. According to the results, it has been determined that there are some unidirectional and bidirectional causality relationships both in some country groups and between some variables.

Keywords: Mental Health, Economic Development, Panel Data Analysis, Socioeconomics, BRICS-T.

JEL Classification Codes: O10, I10, I15, I18.

ÖZ

Mental hastalıklar son dönemin en büyük toplumsal sorunlarından biridir. Değişen ve gelişen dünyada önemli bir halk sağlığı sorunu olan mental hastalıklar, ekonomik gelişme sürecinin bir çıktısı olarak değerlendirilebilir. Bu noktadan hareketle çalışmada dünya ekonomisinde önemli bir yere sahip olan BRICS-T ülkelerinde ekonomik kalkınma sürecinin çıktılarından biri olan ruhsal hastalıkların bazı sosyoekonomik değişkenler ile ilişkisi araştırılmıştır. Bu çalışmada, 1990-2019 dönemi için kişi başına düşen gelir düzeyi ile eğitim, sağlık, demokrasi ve gelir dağılımını temsil eden değişkenlerin ruhsal hastalıklar üzerindeki etkisi Kuznets modeli yardımıyla araştırılmıştır. İlk olarak tanımlayıcı istatistikler, heteroskadastisite, otokorelasyon ve yatay kesit bağımlılık testleri uygulanmıştır. İkinci olarak tahmin sürecinde GLS ve Driscoll-Kraay tahmin testleri kullanılmış ve BRICS-T ülke grubunda ruhsal hastalıklar ile kişi başına düşen gelir arasında "U" şeklinde bir ilişki olduğu saptanmıştır. Değişkenler arasındaki nedensellik ilişkilerini belirlemek için Konya nedensellik testi uygulanmıştır. Elde edilen sonuçlara göre hem bazı ülke gruplarında hem de bazı değişkenler arasında tek yönlü ve çift yönlü nedensellik ilişkilerinin bulunduğu tespit edilmiştir.

Anahtar Kelimeler: Mental Hastalık, Ekonomik Gelişme, Panel Veri Analizi, Sosyoekonomi, BRICS-T.

JEL Sınıflandırma Kodları: O10, I10, I15, I18.

[1] Bayburt Üniversitesi, Meslek Yüksekokulu, Department of Management and Organization, ofgultekin@bayburt.edu.tr

[2] Atatürk Üniversitesi, Ekonomi ve Yönetim Bilimleri Fakültesi, Ekonomi Bölümü, osemsen@atauni.edu.tr

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GENİŞLETİLMİŞ ÖZET

Amaç ve Kapsam: Çalışmanın amacı gelişmekete olan ülkelerde ekonomik gelişmenin mental hastalıklara olan etkilerini tartışmaktır. Dünya ekonomisinde önemli bir yere sahip olan BRICS-T ülkeleri için yapılan araştırma özellikle son dönemin ön plana çıkan problemlerinden olan mental hastalıkların gelişme süreçlerine bağlı etkilerini ortaya koyarak konuya dikkat çekmek yine çalışmanın önemli bir boyutunu oluşturmaktadır. Bununla beraber hastalıkların doğrudan ve dolaylı etkileri, toplumsal açıdan potansiyel üretim ve işgücü kaybına yol açmaktadır. Buradan hareketle mental hastalıkların ekonoik kalkınmayla karşılıklı bir etkileşim sürecinden de söz edilebilir. Çalışmanın kapsamını ön plana çıkan gelişmekte olan ülkeler BRICS-T grubu oluşturmaktadır. Bu ülkeler sırasıyla Brezilya, Rusya, Hindistan, Çin ve Güney Afrika ile Türkiye oluşturmaktadır. Bahsi geçen ülkeler dünya üretimi içerisinde çok büyük bir paya sahip olmalarının yanı sıra yüksek nüfus düzeyi, belli bir ekonomik büyüme ve gelişme hızına da sahiptir. Bu durum, ülke grubunu birçok araştırmaya dahil ederken, mental hastalıkların yüksek gelişme potansiyeline sahip olan ülkelerdeki etkilerini ortaya koymayı amaçlayan çalışmada da analize dahil edilmesini sağlamıştır. Bu bağlamda çalışmanın kapsamını BRICS-T grubu oluşturmaktadır.

Yöntem: Çalışmada kullanılan değişkenler mental hastalıkların nüfus içerisindeki payı, 2015 sabit fiyatlarıyla kişi başına düşen gelir düzeyi, doğumda yaşam beklentisi, kadın başı doğum oranı, şehirde yaşayan insan sayısı, okullaşma oranı, demokrasi puanı ve gelir eşitsizliğini temsilen Gini katsayısıdır. Çalışmanın verileri 1990-2019 dönemini kapsamaktadır. Çalışmada kullanılan değişkenler arasındaki ilişkilerin sınanması için temel testler uygulanmıştır. Bu bağlamda tanımlayıcı istatistikler, korelasyon matrisi, VIF testi, yatay kesit bağımlılığı, otokorelasyon ve değişen varyans testleri uygulanmıştır. Buna bağlı olarak seriler arası ilişkileri ortaya koyabilmek için Kuznets modeli kullanılarak tahmin yapılmış ve tahmin sürecinde yatay kesit bağımlılığı, otokorelasyon değişen varyans gibi problemlere karşı dirençli tahminciler olan Driscoll-Kraay ve Genelleştirilmiş En Küçük Kareler (GLS) testleri kullanılmıştır. Sonraki aşamada (N<T) ve diğer problemlere uygun olması nedeniyle mental hastalık ekonomik gelişme arasındaki karşılıklı nedensellik ilişkilerinin araştırılması için panel Konya nedensellik testi kullanılmıştır. Tahmin testleri ve nedensellik ilişkilerinin çıktıları da çalışmada yer almıştır.

Bulgular: Elde edilen bulgulara göre seriler arasında yatay kesit bağımlılığı, değişen varyans, otokorelasyon gibi sorunlar bulunmaktadır. Bu sorunlara dirençli tahminciler olarak kullanılan Driscoll-Kraay ve Genelleştirilmiş En Küçük Kareler tahmin testlerinin sonuçlarına göre kişi başına düşen gelir düzeyi ve mental hastalıklar arasında "U" şeklinde bir ilişkinin bulunduğu tespit edilmiştir. Buna göre kişi başına düşen gelir düzeyine bağlı olarak mental hastalıkların nüfus içindeki payı, belirli bir kişi başına gelir düzeyine kadar azalan, belirli bir kişi başına gelir düzeyinden sonra artan bir davranış sergilemiştir. Mental hastalıkların dönüm noktaları, Driscoll-Kraay testi için yaklaşık 2700$, Genelleştirilmiş En Küçük Kareler testi için yaklaşık olarak 3230$ olarak hesaplanmıştır. Bunun yanı sıra doğumda beklenen yaşam süresi, kadın başı doğum oranı ve Gini katsayısı mental hastalıkların nüfus içindeki payını pozitif etkilerken, ortalama okullaşma ve şehirde yaşayan insan sayısı mental hastalıkları negative etkilemiştir. Panel Konya nedensellik test sonuçlarına göre ise kişi başına düşen gelir düzeyi ve demokrasiden mental hastalıklara doğru modelin geneli için tek yönlü bir nedensellik ilişkisi mevcutken, gelir eşitsizliği, doğumda beklenen yaşam süresi ve şehirde yaşayan insan sayısı ile mental hastalıklar arasında çift yönlü bir nedensellik ilişkisi bulunmaktadır. Ortalama okullaşma ve kadın başı doğum oranı ile mental hastalıklar arasında modelin tümü için anlamlı nedensellik ilişkileri bulunmazken, bazı ülkeler için anlamlı ilişkilerin bulunduğu gözlenmiştir.

Sonuç ve Tartışma: Mental hastalıklar son dönemde hızla artmakta olup gelişmiş ve gelişmekte olan birçok ülke için mücadele edilmesi gereken önemli bir sorun haline gelmiştir. Genetik ve çevresel faktörler, sosyal ilişkilerde yaşanan problemler bu hastalıkların yayılmasında önemli bir pay sahibi olsa da, sosyoekonomik faktörler de bu tarz hastalıkların bir tehdit unsuru olarak iktisadi gelişme süreçlerini etkilediğini göz önünde bulundurmak gerekir. Ekonomik durum, bireylerin sosyal ve psikolojik hallerini ve çevreyle olan ilişkilerini doğrudan etkilemektedir. Bu noktada ekonomik olarak belirli bir eşik gelir düzeyine sahip olan gelişmiş ekonomilerdeki hastalık etkilerinden öte, küresel ekonomide büyük bir pay sahibi olan gelişmekte olan ülkelerdeki mental hastalık etkilerine odaklanılması, konuyu daha önemli bir hale getirmektedir. BRICS ülkeleri ve Türkiye'nin gelişmiş ülkelere kıyasla başta düşük kişi başına gelir düzeyi ve gelir dağılımı olmak üzere yaşadıkları ekonomik problemlerin bu ülke gruplarında yol açabileceği muhtemel mental hastalıklar üzerine odaklanılması bu tür hastalıklarla mücadele için küresel bir etkinlik ve işbirliği alanı oluşturabilir. Elde edilen sonuçlar afaei (2012), Tampubolon ve Hanandita (2014), Song ve Kim (2020), Scheve vd. (2022) ve Zeeman ve diğerleri. (2021), Pickett vd. (2006) bulgularıyla örtüşmektedir.

1. INTRODUCTION

According to the definition made by the World Health Organization (WHO), mental health; It can be expressed as the state of being in good shape, where an individual is aware of his/her own abilities, can cope with the normal stresses of life, can work efficiently, and contribute to the society they live in. While diseases accepted as mental illnesses in terms of WHO are expressed as depression, bipolar disorder, schizophrenia, dementia, and other psychotic diseases, it is claimed that there are personal, social, and environmental effects on the basis of the diseases (WHO, 2018; WHO, 2019). It can be argued that this type of disease may be caused by genetic codes, and traumas experienced both in the individual and in the society may be effective, but it can still be argued that the income level representing the status of the person among the underlying factors of mental diseases will be an important factor in catching the disease.

In the ongoing first part of the study, it was continued with the literature review on the socioeconomic determinants of mental diseases, and it was tried to create clues for both variable determination and method selection for this study. Because when the current literature is examined, there are studies that deal with the subject in the context of different disciplines, as well as the existence of differences in the findings due to the differences in terms of the period, data set and method discussed in the studies that look at the discipline of economics. In this study, it has been determined that there are a priori signals that patients in the mental illness group will show significant differences depending on the development level of that country. Therefore, it can be thought that per capita income figures, which are currently accepted as one of the most important indicators in terms of revealing development differences, will be an important variable. Accordingly, it is expected that there will be a negative relationship between income level and mental illnesses in the first place, and then a positive relationship between income level and mental illnesses after a certain threshold value is exceeded. This expected relationship between income and mental illness is thought to fit the description of S. Kuznets, who first suggested that there would be a course between income and income distribution, from a different perspective. Therefore, the main hypothesis of the study will be constructed in this way. On the other hand, based on the studies in the literature for the use of control variables for this relationship research between mental illnesses and income, the Gini coefficient as a measure of fairness in income distribution, life expectancy at birth, average schooling rate, the number of people living in the city, the civil liberties coefficient representing democracy, and the birth rate per woman. planned to be used.

In the third part of the study, the expected signs of the variables used in the model, which are thought to influence mental illnesses, were tried to be revealed at the theoretical level. In the fourth part, although the available data period for BRICS-T countries is between 1990-2019, since India's data covers the period between 1990-2015, this period was subjected to panel data analysis. In the context of panel analyses, it is planned to obtain Pooled Effects Estimation Results and Driscoll-Kraay and GLS Estimate Results, and in addition to this, Panel Konya Causality Test is considered. In the conclusion part of the study, a general evaluation was tried to be made. Literature research

There are some studies in the international literature on the relationship of mental diseases with income growth and socioeconomic variables. However, there is a serious deficiency in the Turkish literature on the subject. In the foreign literature, there are studies that deal with the subject from socioeconomic and sociopsychological aspects, but there are also studies that make use of different disciplines. At this point, the remarkable thing is that the subject has the opportunity to be handled from different disciplinary frameworks and with different statistical methods. This situation provides the researchers with the opportunity to evaluate the studies from different points. Although the discussions on mental diseases were only medical in the beginning, there has been an axis shift towards relations with different disciplines, especially economy and environment. In this case, since the focus of the study is economic and social effects, a literature framework will be created by making use of the studies on the socioeconomic basis in the literature.

The first thing that draws attention in the literature studies on mental diseases is that the research groups contain different results depending on their economic and social structures. In this respect, it can be argued that the economic development levels of countries have an important determinant role in the evaluations to be made on the economic dimensions of mental illnesses. It can also be claimed that some socio-economic factors have a reducing effect on diseases, especially in cases where certain thresholds cannot be bypassed in terms of income increase, especially in terms of developing societies. Because, although the insufficient development of dynamics such as income inequality and democracy that affect the functioning of social life in a developing society harms social balances, other factors affecting social development such as schooling, urbanization, and the increase in birth rate also increase the capacity to create welfare on societies, increase expectations from life and lead to life. may have

positive effects on retention. One of the issues to be evaluated here is which of these effects has more impact on societies. At this point, the Kuznets-based analysis method used in the study can be a guide to a certain extent. Calculating the turning points of the per capita income level as a representative of the increase in welfare and the behaviour of the curve can give researchers an idea. On the other hand, one of the important issues to be discussed about mental illnesses is that researches are generally based on high-income countries. There is not enough research in the literature on low- and middle-income countries.

2. LITERAURE

While some studies on mental illnesses claim that an increase in income has a reducing effect on diseases, some studies have suggested that an increase in income has an increasing effect on diseases. For example, Li et al. (2006) claimed that the tendency of mental illness is higher in individuals who migrate from rural to urban areas with low-income levels in China. Safaei (2012), on the other hand, conducted a similar study for Canada and argued that the tendency for mental illness is higher in low-income segments and that the increase in income for these income segments may be effective in keeping the disease at a low level. In their study for Indonesia, Tampubolon and Hanandita (2014) suggested that a 1% decrease in per capita household expenditure would increase the depression tendency by 0.05%. On the other hand, it has been claimed by the authors that personal social capital and religiosity are also positively related to mental health, while negative events are negatively related. Song and Kim (2020) also presented a study suggesting that households with relatively low incomes in South Korea are more prone to depression. Similarly, Zeeman et al. (2021), in their research on different economic income segments in the USA, suggested that an increase in income has a reducing effect on mental illnesses, especially stress. Based on the studies, it can be argued that poverty is directly related to mental illnesses.

There are also studies suggesting that an increase in income influences increasing mental illnesses, and one of the noteworthy ones is the study of Pickett et al. (2006). In the research conducted on 8 developed countries (USA, France, Netherlands, Belgium, Spain, Germany, Italy, and Japan) through the surveys of the WHO, it has been suggested that the increase in income has an effect on increasing mental illnesses. Within countries, disadvantages based on socioeconomic factors (low education, unemployment, and deprivation) and low levels of social capital have been associated with mental illness. Scheve et al. (2022) investigated whether economic shocks affect individual mental illnesses in Malawi through panel data analysis, and according to their findings, they suggested that factors that cause individual economic problems such as loss of a family member, loss of agricultural productivity and income have a role in the formation of mental illnesses.

Discussions on studies dealing with mental illnesses and socioeconomic variables reveal that socioeconomic factors are directly related to mental illnesses. Studies on the positive effects of income inequality and poverty on diseases draw attention. Singh and Siahpush (2006) investigated the effect of socioeconomic inequalities on life expectancy at birth in the USA. Their findings suggested that individuals in groups with less inequality had a longer life expectancy at all ages than those in groups with less inequality. Dorling et al. (2007) investigated the health effects of income inequality around the world and found that the effect of income inequality on death rates is more closely related to changes in material wealth. They argued that death rates are higher in regions such as Africa, where income inequality is particularly prevalent, and that in more unequal countries, the death rate is higher for a given general income level. Uutela (2010) claimed that economic recessions and crises cause mental illnesses. Elgar et al. (2015) investigated the effects of socioeconomic inequalities on mental illnesses in adolescents. According to their findings, socioeconomic inequalities due to income inequality may negatively affect the future health status of individuals. Rohde et al. (2016) investigated the effects of economic insecurity on mental illnesses in Australia, and they developed a data set measuring economic insecurity and investigated the effects of this data set on mental illnesses by using the pooled effects estimator, which is one of the panel data estimation methods. According to their findings, job insecurity, financial dissatisfaction, fluctuation in income, inability to meet standard expenditures and lack of access to emergency funds directly affect health conditions and showed that increases in economic insecurity can directly affect mental illness morbidity. Patel et al. (2018) in their literature research on studies investigating the relationship between income inequality and depression, they stated that income inequality has an increasing effect on depression in most of the existing studies. Li et al. (2021) investigated the relationship between socioeconomic inequalities and child mental health; According to the findings they obtained, low parental education and low per capita income level, especially in low-income segments during the pandemic period, have an increasing effect on children's mental illnesses. Lyu and Sun (2020) investigated the effects of personal relative deprivation on cognitive function and mental illness for older age

groups in China using panel data analysis. Their findings revealed that personal relative deprivation had a negative impact on mental health. When the analyzes for urbanization, which is one of the important indicators of socioeconomic development, are discussed, it can be mentioned that there is a lack of studies investigating the relationship between mental illnesses and urbanization. Although there are studies on the subject in the literature, the general opinion is that the relationship between mental illness and urbanization does not reveal a clear result. In the emergence of this situation, researches generally focus on socioeconomic instruments such as income inequality, poverty and unemployment, and researches are generally conducted in micro dimensions. One of the studies that can be evaluated on the subject belongs to Chen and Chen (2015). The authors investigated the relationship between urbanization and mental illness in China using data from a national survey conducted in China in 2011, but they could not find a significant relationship between urbanization and the presence of mental illness. The authors suggest that more attention and policies should be developed to address the effects of urbanization on mental illness.

One of the important studies on the subject is the research conducted by Ventriglio et al. (2020). The authors found that urbanization affects mental health through social, economic, and environmental factors, common mental syndromes reported a higher prevalence in cities, and the reason for this was social inequalities, social insecurity, pollution, and lack of contact with nature. have expressed. It is a fact that urbanization creates some health effects, especially in societies that have economic and social problems. While research generally focuses on these problems, it is necessary to expand the scope of research on the subject. The general conclusion obtained from the studies in the literature is that there is a direct relationship between some socioeconomic factors that cause mental diseases and these diseases. At this point, especially the results obtained by different research methods support the claim.

3. DATASET AND METHOD

The data of the study covers the period of 1990-2019 and the period that can be obtained for the data was used. While the numerical estimation values of mental diseases alone do not produce a clear result about the model, the ratio of the data to the population will provide significant advantages to the research in the process of interpreting the results and effects. From this point of view, another distinguishing feature of the study is to investigate the relationship between mental illnesses and increase in welfare, especially based on income per capita calculated with purchasing power parity, where inflation can also be implicitly included in the research. On the other hand, there is a serious deficiency in the Turkish literature on the subject, and the number of studies investigating the effects of economic development on mental diseases on a theoretical or empirical basis by including Turkey in the studies in the English literature is also limited. In the studies in the literature, the subject has generally been evaluated on a psychiatric basis, and cultural and socioeconomic variables are included as an indirect or secondary element in the studies. At this point, the aim of the study is to investigate the relations of mental diseases, which are an important problem of individual and social life based on economic development, with socioeconomic variables for BRICS-T countries.

While creating the variables in the light of the information above, the variables affecting the city life and the economy were determined based on the variables in the literature. Accordingly, the variables used in the model are the share of mental illnesses in the population, per capita income, the second power of per capita income, life expectancy at birth, birth rate per woman, and the number of people living in cities. Among the variables used in the model, the first and second powers of the per capita income level represent the welfare level. Average life expectancy represents the level of health. Finally, the birth rate per woman and the number of people living in the city are directly dependent on economic development but represent the economic and social competition and pressure that city life will bring. At this point, using such a variable for the BRICS countries and Turkey, which has an important place in the world economy and ranks high among the developing country groups, increases the importance of the issue, since societies with a high level of education and hope for the future will have a higher desire to bring a new child to the world. When evaluated in terms of economic development, developed countries have less population growth rate, high level of education and conscious individuals, while underdeveloped countries consist of individuals with high population level and population growth rate, low education, and lower consciousness. The main aim of developing countries is to create more conscious and developed societies with higher income, wealth, and education levels. Based on this expression, it can be said that developing countries are in a process of structural transformation to meet the needs they need, and the social and social structure will change in this process along with the production structure. With this situation, the birth rate per woman emerges as an

important indicator that draws attention to whether developing societies can have the same level of development homogeneously. However, another variable that is important for research is the rate of urbanization. Urbanization rate is important in terms of planning and management of basic needs such as nutrition, health, education, employment, and environment at the point of migration of the world population from rural areas to cities in the recent period. However, a remarkable point in the model created regarding the urbanization rate is the strength of its relationship with the per capita income level, which is the reflection of production capacity and welfare in the economy. The main factor in the emergence of this situation can be stated that the level of social welfare achieved in cities is higher than in rural areas, and therefore the per capita income level, which is an important indicator of social welfare, is directly proportional to the rate of urbanization. Urbanization rate was not included in the model as a variable, as this would lead to biased results due to the relationship of high urbanization with income level for a possible model to be established. Instead, the number of people living in the city was used as one of the control variables in the model.

Among the variables used in the model, the share of mental illnesses in the population is from the OurWorldInData data platform, per capita income level, life expectancy at birth, birth rate per woman and the number of people living in the city are from World Bank data, average schooling is from the United Nations Development Program (UNDP) database, representing democracy. The civil liberties coefficient was obtained from Freedom House data, and the Gini coefficient data representing income inequality was obtained from data calculated by Solt (2018). While researching the model, correlation matrix, autocorrelation, multicollinearity, varying variance, cross-section dependence, some estimation and causality tests were used respectively. In this direction, the results obtained were interpreted and the relationship between depression and economic development processes was evaluated. The model of the study based on the above information:

$$y_{it} = \beta_0 + \beta_{1i} GDPPC_{it} + \beta_{2i} GDPPC_{it}^2 + \beta_{3i} Life_{it} + \beta_{4i} City_{it} + \beta_{5i} Gini_{it} + \beta_{6i} Democ_{it} + \beta_{7i} Birth_{it} + \beta_{8i} School_{it} + \varepsilon_{it} \quad (1)$$

expressed as. In the model, i=1, 2,…,6 indicates the countries, t=1,2,3,....,30 indicates the time period. On the other hand, "y_{it} " represents the share of mental illnesses in the population, "$GDPPC_{it}$" represents the per capita income, "$GDPPC_{it}^2$" represents the squared of gdp per capita, "$Life_{it}$" represents life expectancy at birth, "$City_{it}$" represents the number of people living in the city, "$Gini_{it}$" represents the Gini coefficient that emphasizes income inequality, "$Democ_{it}$" is the civil liberties coefficient representing democracy, "$Birth_{it}$" represents the birthrate per woman, "$School_{it}$" represenrts the average schooling rate and "ε_{it}" represents the error term. The variables used in the model were created by considering the increase in welfare and socioeconomic factors. The natural logarithmic values of the variables were taken. The natural logarithmic values of the variable of births per woman are arranged with the following method, which is frequently used in the literature because it contains results less than zero in some periods (Busse and Hefeker, 2007; Odugbesan et al., 2021).

$$y = \ln\left(x + \sqrt{(x^2+1)}\right) \quad (2)$$

3.1. Expectations from the Model

Based on the data, the expectations from the model can be expressed as follows:

i) Although the per capita income level has increased with the effects of welfare, many societies have experienced economic problems, especially because of the 2008 global crisis, and this has affected the level of public health. In addition, due to factors such as unemployment increase, social and psychological effects caused by migration from village to city, and stress caused by daily life, the increase in mental illnesses can be expected to increase more rapidly, especially with a certain population level, depending on the increase in income.

ii) Income inequality draws attention as an important social problem. Income inequality is more common especially in low and middle-income countries, and it has been stated in the studies in the literature that it has an increasing effect on mental illnesses. Therefore, in the study, it can be expected that income inequality has a positive effect on mental illnesses.

iii) One of the important variables related to research is human lifespan. Technically, the average life expectancy included in the model with the title of life expectancy at birth is expected to have a positive effect on mental illnesses since such diseases are more common in the high age group.

iv) Other control variables of the study include the birthrate per woman, the civil liberties score representing democracy, and the schooling rate. The increase in the rate of birth per woman and the tendency of schooling increases the potential human capital for societies, and when evaluated on a family basis, the increase in the responsibilities of parents in child-rearing may lead them to problems such as depression and anxiety. Financial difficulties, especially in families with many children, may cause family members to be exposed to mental illnesses such as depression. The tendency to go to school, on the other hand, can increase the responsibilities of families and lead them to move away from mental illnesses. The development of the understanding of democracy, on the other hand, can have a decreasing effect on mental illnesses by increasing freedoms. With these effects, it can be expected that the birth rate per woman in the model will increase mental diseases, and the effect of average schooling and democracy will influence reducing mental diseases.

v) The last variable regarding the research is the number of people living in the city. The high correlation of the urbanization rate with the per capita income level led to the use of the number of people living in the city as a variable for the city in the model. An issue that should be evaluated here is that the number of people living in the city has an increasing effect on both the income level and the population. Since the production capacity will increase as the cities develop, the increase in the number of people living in the city means an indirect population increase for the societies. Although this situation has an effect that increases the tendency to mental illness at the beginning, this effect can be evaluated in the model through the relationship between per capita income level and mental illness. Considering the number of people living in the city together with the mental illness-population ratio chosen as the dependent variable when evaluated in terms of the established model, the increase in the number of people living in the city will increase the population, and the mental illness-population ratio will decrease and a negative relationship between them will be expected. However, since the city effect can be observed at the per capita income level, a positive relationship between per capita income level and mental illnesses will indirectly indicate a positive relationship between urbanization and mental illness.

3.4. Ethical Status of the Study

Ethics committee was not taken because secondary data were used in this study.

4. RESULTS

Among the findings of the research, firstly, there are descriptive statistics results. Results were generated for the natural logarithmic values of the variables. Since the Gini coefficient for the period 2015-2019 in India could not be found, the estimation was made with incomplete data.

Table 1. Descriptive Statistics

Variable	Average	Std. dev.	Min.	Max.	Observation
Share of Mental Diseases in Population	2.587038	0.146305	2.422854	2.90411	180
Gdp Per Capita	8.384202	0.835273	6.268177	9.393229	180
Gdp Per Capita2	70.98864	13.20512	39.29004	88.23277	180
Life Expected at Birth	4.214175	0.0894034	3.978634	4.352739	180
Democracy	1.28959	0.4080724	0.6931472	1.94591	180
People Living in the City	18.6302	1.050773	16.76781	20.55955	180
Average Schooling Rate	1.931269	0.3333246	1.098612	2.501436	180
Income Inequality	3.801261	0.2017276	3.222868	4.15104	176

Table 1 shows the descriptive statistics values of the variables. Accordingly, the average, standard deviation, minimum, maximum, and number of observations of the variables are shown in the table, and the values obtained in the number of people living in the city were calculated relatively higher in the first and second powers of the per capita income level. Related to the subject, the correlation matrix of the variables is given in the table below. The names of the variables have been shortened due to the size of the table and included in the table.

Table 2. Correlation Matrix

Variable	Mental	GDPPC	$GDPPC^2$	Life	Democ.	City	School.	Inequal.
Mental	1.0000							
GDPPC	0.0071	1.0000						
$GDPPC^2$	0.0219	0.9990	1.0000					
Life	0.2692	0.3920	0.4010	1.0000				
Democ.	-0.3831	-0.0800	-0.0794	0.4455	1.0000			
City	0.1249	-0.4312	-0.4265	0.4554	0.4375	1.0000		

School.	-0.5644	0.6282	0.6213	0.0474	-0.0357	-0.2765	1.0000	
Inequality	0.1963	0.0411	0.0280	-0.4977	-0.6015	-0.3954	-0.0811	1.0000
Birth	0.2967	-0.4576	-0.4506	-0.5581	-0.3873	-0.3363	-0.6412	0.5420

Table 2 shows the results of the correlation matrix of the variables. According to the results of the correlation matrix, there are no strong relationships between the variables. Since the correlation values among the variables are less than 0.70, it is not possible to talk about a strong correlation between the variables. It is an expected result that only the correlation values between the first and second powers of the per capita income level are high. The fact that the relationships between the variables are not strong will allow the variables of the research to not contain each other and the results to be obtained in the estimation process to be evaluated in a healthy way. In the continuation of the study, the VIF (Variance Inflation Factor) test, which tests the multicollinearity problem, which is directly related to whether the variables contain each other or not, was applied with the correlation matrix.

Table 3. VIF Test Results

Varible	VIF	1/VIF
Gdp Per Capita	5.38	0.185887
People Living in the City	4.29	0.232986
Life Expected at Birth	3.10	0.322341
Democracy	2.51	0.397770
Expected Schooling Rate	2.32	0.430138
Income Inequality	2.12	0.471660
Average VIF Value	3.29	

According to the VIF test results in Table 3, the mean VIF value of the model was calculated as 3.29. According to many studies in the literature, while the mean VIF value is higher than 5 points to the multicollinearity problem (Menard 1995; O'Brien, 2007), the general idea in the literature is that the average VIF value up to 10 in the models to be created is a problem. (Mason, Gunst, & Hess, 1989; Marquardt 1970; Kennedy, 1992). In the continuation of the study, the Breusch-Pagan and White tests, which test heteroscadsticity (varying variance), were applied. The results of heteroscadsticity tests are shown in Table 4.

Table 4. Heteroskedasticity Results (White Test)

Test	Chi2	df	p value
Heteroskedasticity	141.27	43	0.0000
Skewness	19.97	8	0.0105
Kurtosis	0.28	1	0.5992
Total	161.51	52	0.0000

In the results of the White tests applied to determine the changing variance situation, the hypothesis "There is no Serial Correlation in H_0 Series" for the White test was rejected because the probability value of the test result was less than 0.05. Since the probability value of the total part of the White test results, which is a powerful test for the variable variance problem, is less than 0.05, the hypothesis of "There is no Serial Correlation in H_0 Series" is rejected, and it can be stated that there is a changing variance problem between the series for the White test results.

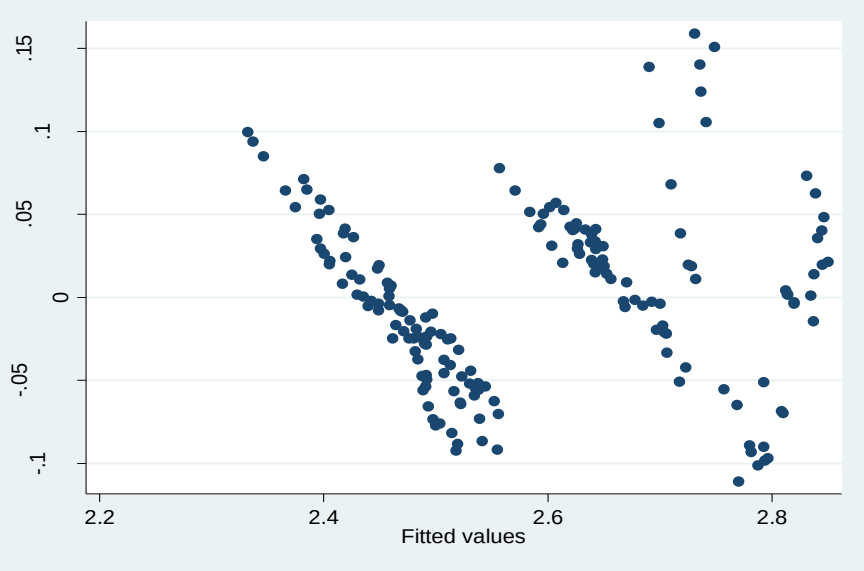


Figure 1. Distribution of Residuals

The changing variance problem states that the variances of the residuals between the series are not randomly distributed. This situation is supported by the image above and shows that the residues are not homogeneously distributed and are in a certain trend. The autocorrelation test, which is also an important test of the research, constitutes an important part of the study. The results of the autocorrelation test suggested by Wooldridge (2010) for the series are also shown in Table 5.

Table 5. Autocorrelation Test Results

F (1,5)	Prob> F
970.498	0.0000

According to the Wooldridge autocorrelation test results, since the probability value is less than 0.05, the hypothesis of "H_0: There is no first-order autocorrelation" was rejected and it was determined that there was an autocorrelation problem between the series. Cross-section dependency test results shown in Table 6.

Table 6. Cross-Section Dependency Test Results

Variable	Breusch-Pagan LM	Pesaran scaled LM	Bias-corrected scaled LM	Pesaran CD
GDP Per Capita	375.3474***	65.79014***	65.68669***	19.31829***
GDP Per Capita^2	376.7290***	66.04237***	65.93892***	19.35955***
Life time	252.5318***	43.36718***	43.26373***	13.31294***
Head of Woman	224.7143***	38.28842***	38.18497***	10.82399***
City People Count.	359.7803***	62.94798***	62.84453***	9.533257***
Democracy	148.4724***	24.36861***	24.26516***	2.699700***
Schooling	408.0270***	71.75658***	71.65313***	20.18686***
Income inequality	257.1698***	44.21395***	44.11051***	-0.470855

Since the probability values between the series are statistically smaller than 1% according to the cross-sectional dependence test results, the hypothesis of "H0: There is no cross-sectional dependence between the series" is rejected and it is accepted that there is a cross-sectional dependence between the series. Although it is said that there is no cross-sectional dependence for the Pesaran CD test result only for the income inequality variable, the same cannot be said for other variables. In this case, it can be said that there is a cross-section dependency in the model.

Since there are problems such as changing variance, autocorrelation and cross-section dependence in the study, estimation tests that consider the problems such as cross-section dependence and changing variance between series should be used while estimating. Accordingly, the use of Ordinary Least Squares estimators, which do not primarily consider the cross-section problem, may render the estimation inefficient. On the other hand, the possibility that the error terms of the series are related to each other, and the common error component of the

autocorrelation and varying variance problems may cause the OLS estimation to produce unhealthy results. In this direction, although it is appropriate to use Generalized Least Squares (GLS) and Driscoll-Kraay estimation tests, which consider the problems of cross-sectional dependence, autocorrelation, and varying variance, it is an important part of the research to make EKK estimations with robust estimators in order to increase the richness of the research.

Answers about which model to use when making predictions for series are of great importance. At this point, the Hausman test is one of the most important tests that will help in deciding the model selection. Table 7 contains the results of the Hausman test.

Table 7. Hausman Test Results

Variables	b (Fix Effect)	B (Random Effect)	(b-B)	sqrt(diag(V_b-V_B))
GDP Per Capita	-0.232373	-1.328206	1.095833	0.1265107
GDP Per Capita^2	0.0120441	0.0833911	-0.071347	0.0080796
Life time	0.0832692	0.7110288	-0.6277596	0.1199224
Birth Per Woman	-0.0734512	-0.4259947	0.3525435	0.0970167
People Living in the City	-0.0254269	-0.0663767	0.0409498	0.075599
Democracy	-0.0250505	-0.1838431	0.1587926	0.0248782
Schooling	0.0392872	-0.4875468	0.526834	0.0883007
Income Inequality	-0.0258081	0.2172877	-0.2430958	0.0950793

Remark: chi2(5) = (b-B)'[(V_b-V_B) ^(-1)](b-B) = 143.31 Prob>chi2 = 0.0000

According to the Hausman test results, since the probability values of the series are less than 0.05, the hypothesis of "H_0: Random Effects Hypothesis should be used" will be rejected and the Pooled Effects estimator will be efficient to use. One of the important issues to discuss about estimation is that Pooled or Random effects estimators ignore the cross-sectional dependence problem. At this point, estimation using resistant versions of the Pooled Effects estimator will produce more reliable results to make consistent estimation results. Table 8 shows the normal and resistant results of the Pooled Effects estimator.

Table 8. Pooled Effects Estimation Results

	Pooled Effects Estimation			Pooled Effects Estimation (Robust)		
Variable	Coefficient	Std. Error	t Stats	Coefficient	Std. Error	t Stats.
GDP Per Capita	-0.23237***	0.0790818	-2.94	-0.23237***	0.1254634	0.123
GDP Per Capita^2	0.0120441**	0.0049332	2.44	0.0120441**	0.0074326	0.166
Life time	0.0832692	0.0583135	1.43	0.0832692	0.0972639	0.431
Birth Per Woman	-0.0734512*	0.0417463	-1.76	-0.0734512*	0.0448145	0.162
People Living in the City	-0.0254269	0.0291371	-0.87	-0.0254269	0.0201341	0.262
Democracy	-0.025050**	0.0112957	-2.22	-0.025050**	0.0149283	0.154
Schooling	0.0392872	0.0352517	1.11	0.0392872	0.0726988	0.612
Income Inequality	-0.0258081	0.0405739	-0.64	-0.0258081	0.0253552	0.355
Cons.	3.968189***	0.6233577	6.37	3.968189***	0.5757584	0.001

Remark: ***, **,* marks denote 1%, 5%, and 10% significance levels

The Pooled Effects Estimator, which does not consider cross-sectional dependence, contains certain significant results between series, while the Robust (resistant) version, which considers cross-sectional dependence, does not have significant and significant results between series. However, the importance of the tests in the estimation process, which considers the problems of cross-section dependence, autocorrelation, and varying variance, is remarkable. In the following part of the research, the relationships between the variables will be investigated by using estimators that consider the cross-sectional dependence, autocorrelation, and varying variance problems. The most notable among these estimators are the Driscoll-Kraay and GLS tests. Table 9 contains the results of the Driscoll-Kraay and GLS tests.

Table 9. Driscoll-Kraay and GLS Prediction Results

	F (8, 29) = 1581.22 Prob> F = 0.0000		Wald chi2(8) = 1027.06 Prob> chi2 = 0.0000	
	Driscoll-Kraay Test		**GLS Test**	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
GDP Per Capita	-1.328206***	0.2048124	-1.229255***	0.1439309
GDP Per Capita^2	0.0833911***	0.0131646	0.0768757***	0.0088453
Life time	0.7110288***	0.0925172	0.7047282***	0.0831448
Birth per Woman	0.425994***	0.0607383	0.3710716***	0.0434091
People Living in the City	-0.066376***	0.009047	-0.0623977***	0.008663

Democracy	-0.183843***	0.0152693	-0.1690318***	0.0152208
Schooling	-0.487546***	0.0451797	-0.4472812***	0.0246069
Income Inequality	0.2172877**	0.0617534	0.1702859***	0.0402149
Cons.	7.04065***	1.135186	6.620168***	0.6791066

Remark: ***, **, * marks denote 1%, 5%, and 10% significance levels

According to the results in Table 9, it can be mentioned that there are significant and strong relationships for both tests applied. In the Driscoll-Kraay estimation test, there are negative and positive relationships between mental illnesses and the first and second powers of per capita income, respectively, and the same is true for the GLS test. The main difference between the tests is in the coefficients. Similar results were obtained for other variables. Accordingly, according to the results of both estimation tests, the effects of life expectancy at birth, birth rate per woman and income inequality on mental illnesses are positive; The number of people living in the city, the democracy score and the expected schooling rate have a negative effect on mental illnesses. According to the Driscoll-Kraay estimation test results, the share of mental illnesses in the population, depending on per capita income, decreases until a certain threshold income and increases after a certain threshold income level. In the calculations in the literature, although the cases in which the series behaves in an "inverted U" shape while calculating the turning points of the Traditional Kuznets Curve and the Environmental Kuznets Curve, in this study, the turning point of the threshold per capita income level was calculated, since the relationship between mental illnesses and socioeconomic variables was investigated using the Kuznets model measurement method "$y^{*}=\frac{-\beta_1}{2\beta_2}$" used by Dinda (2004). On the other hand, in a study investigating the health effects of the Environmental Kuznets Curve in the literature, Fotourhchi (2015) calculated the turning points for both "inverted U" and "U"-shaped predictions. Since the natural logarithmic values of the variables were used while making the calculations in this direction, the turning point for the per capita income level was calculated as 7.896164 for the Driscoll-Kraay estimation. This value indicates approximately 2687 dollars. In terms of the estimation model, as the per capita income approaches roughly $2700, the per capita income level has an increasing effect on mental illnesses along with some socioeconomic effects. In other words, for the country group included in the analysis, the relationships between mental illnesses and per capita income follow a "U-curve" path. Safaei (2012), Tampubolon and Hanandita (2014), Song and Kim (2020), Scheve et al. (2022) and Zeeman et al. (2021), which coincides with the findings of Pickett et al. (2006) study draws attention. The relationship between income per capita and mental illness behavior is given in Figure 2.

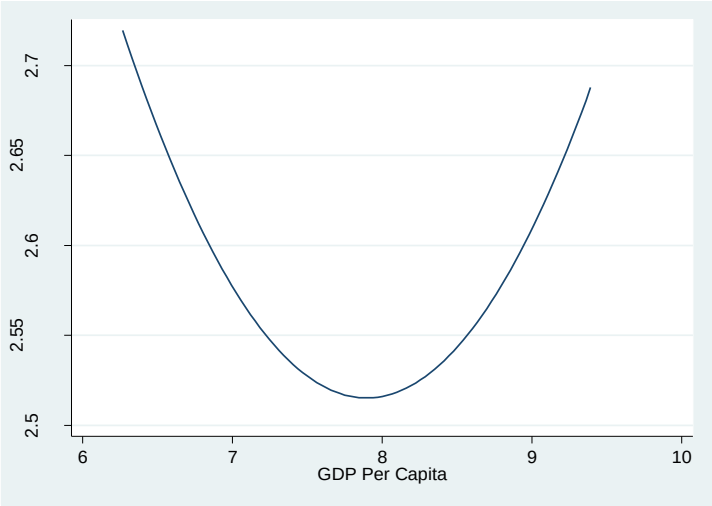


Figure 2. Relationship between Driscoll-Kraay and Mental Health-GDP Per Capita

The behavior pattern depending on the results of the estimation of the relationship between income per capita and mental illness using the GLS estimation test is given in Figure 3. A similar behavioral trend result was obtained through the GLS prediction test, and the turning point was calculated as 8.078209. This value indicates approximately $3224 level. In terms of the estimation model, as the per capita income approaches roughly around $3230, the per capita income level has an increasing effect on mental illnesses along with some socioeconomic effects. The relationship between income per capita and mental illness behavior is given in Figure 3.

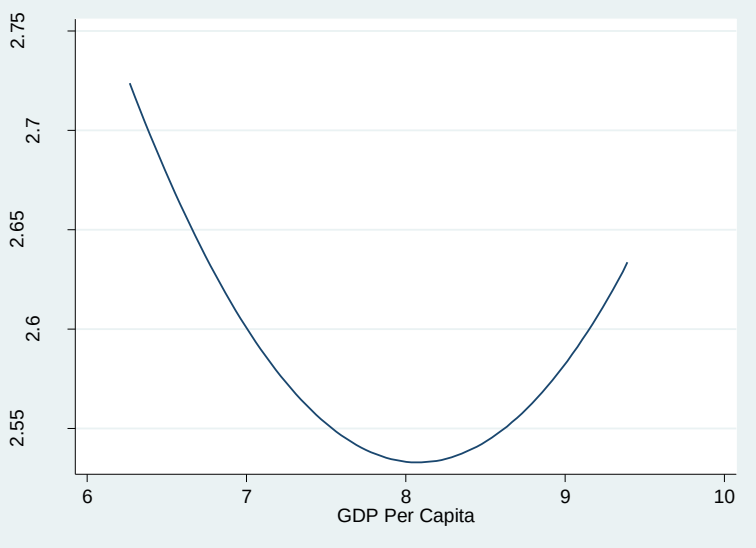
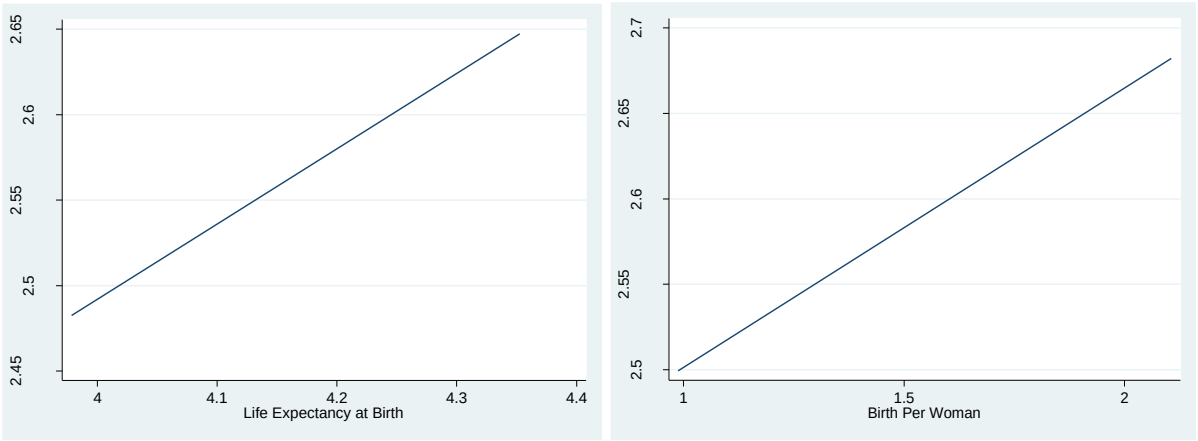


Figure 3. GLS Estimate and Mental Health-GDP Per Capita Relationship

Figure 2 and Figure 3 show mental illness behavior based on per capita income for the Driscoll-Kraay and GLS estimation tests. The different assumptions used by the estimation tests while evaluating the series created differences in the slope and turning points of the graphs. However, a similar trend can be mentioned in general. The relationships of mental diseases with other variables depending on the prediction tests are also given in Figure 4 and Figure 5.



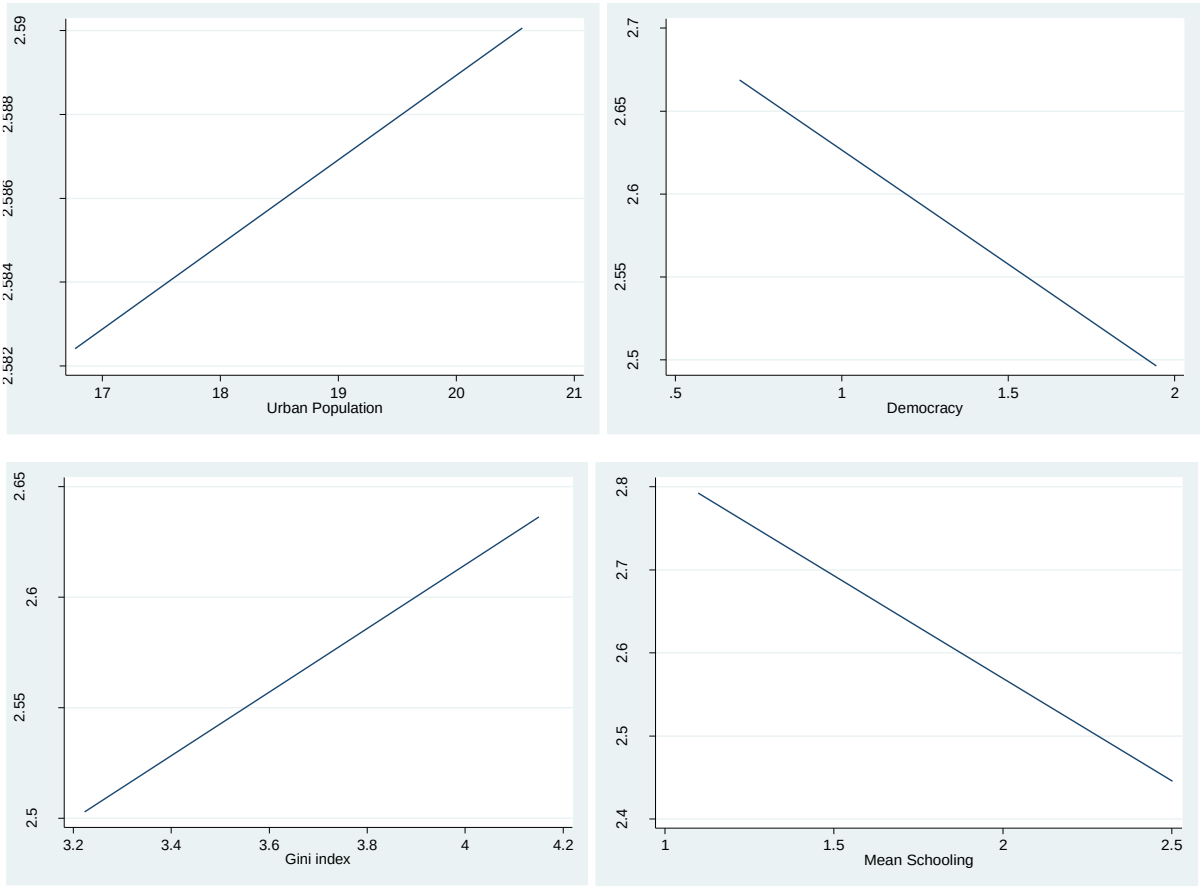
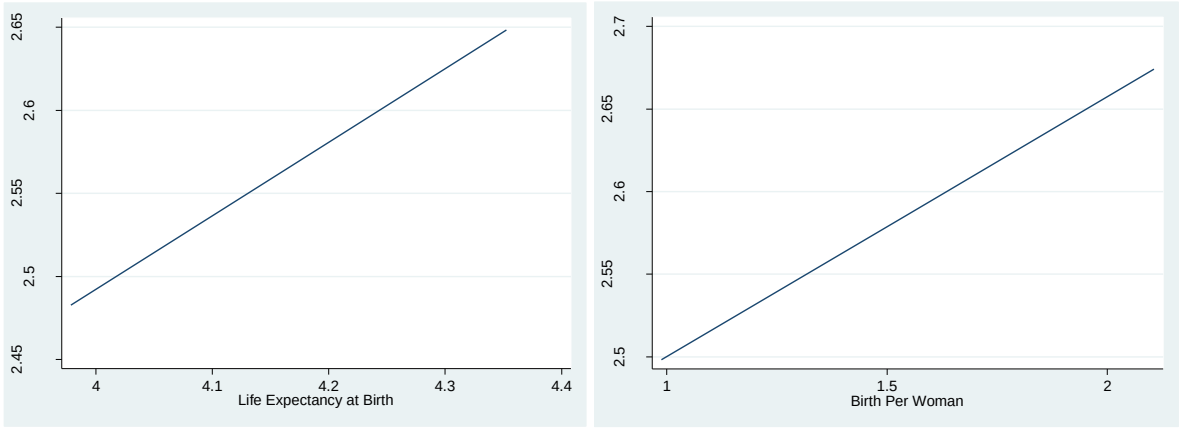


Figure 4. The Relationship between Mental Health and Socioeconomic Variables with Driscoll-Kraay Estimation



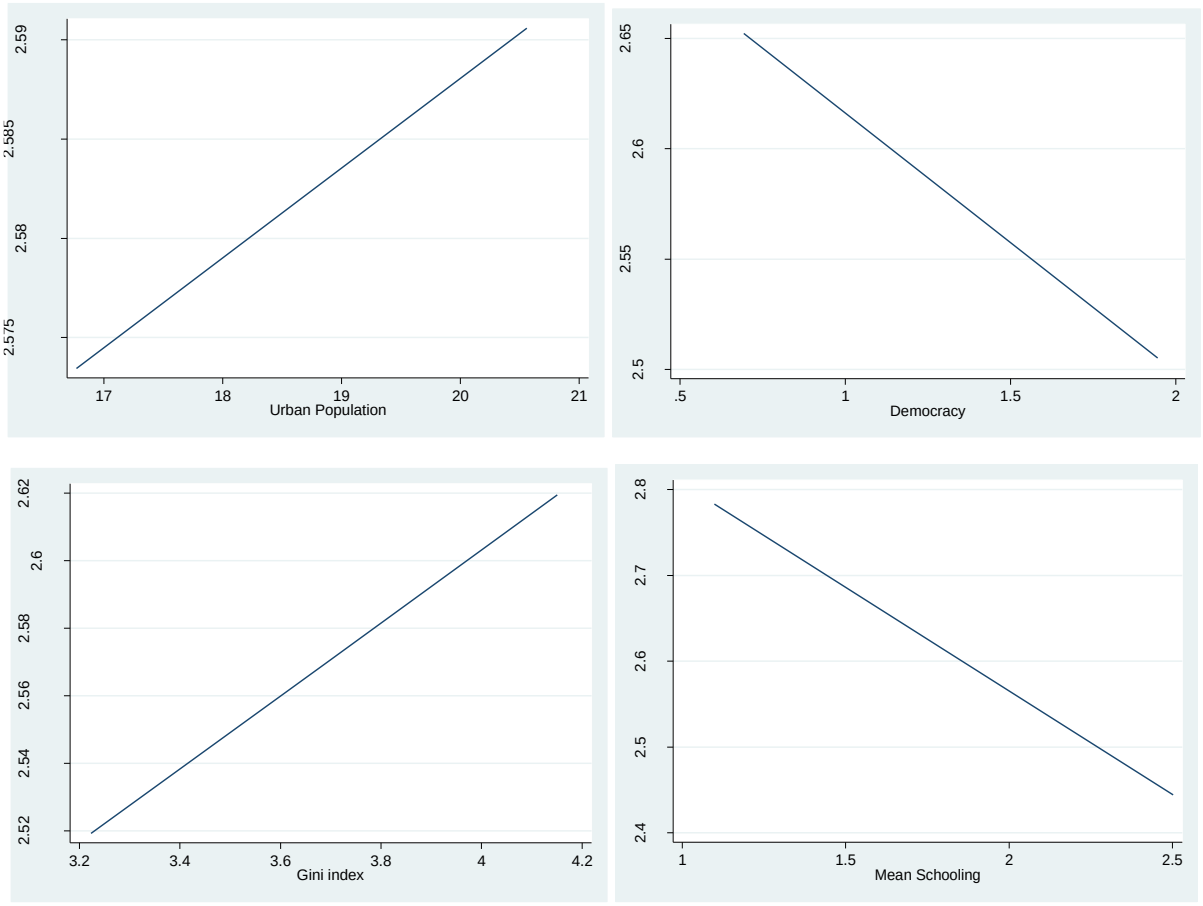


Figure 5. Relationship between GLS Estimation and Mental Health-Socioeconomic Variables

Figure 4 and Figure 5 show the graphical displays of the predictions made using different prediction tests. Accordingly, it can be mentioned that there are positive and negative significant relationships between the variables. In the last stage of the research, the existence of causality relationships between variables will be investigated. Panel Konya (2006) causality test, one of the current causality tests that cares about cross-section dependency, will be used while investigating causality relationships in the series.

The causality test created by Konya (2006) is based on the apparently unrelated regression estimators developed by Zellner (1962). Panel Konya causality test can make separate estimations for each cross-section, and each of these cross-sections is calculated using different bootstrap critical values. This situation distinguishes the Konya causality test from other causality tests. The ability to estimate the cross-section shows that the test also assumes that the series are not homogeneous. Konya causality test can be expressed as follows (Konya, 2006):

$$Y_{1,t}=\alpha_{1,1}+\sum_{i=1}^{ly_1}\beta_{1,1,i}Y_{1,t-i}+\sum_{i=1}^{lx_1}\delta_{1,1,i}X_{1,t-i}+\varepsilon_{1,1,t} \quad (3)$$

$$Y_{2,t}=\alpha_{1,2}+\sum_{i=1}^{ly_1}\beta_{1,2,i}Y_{2,t-i}+\sum_{i=1}^{lx_1}\delta_{1,2,i}X_{2,t-i}+\varepsilon_{1,2,t}$$

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$$Y_{N,t}=\alpha_{1,N}+\sum_{i=1}^{ly_1}\beta_{1,N,i}Y_{N,t-i}+\sum_{i=1}^{lx_1}\delta_{1,N,i}X_{N,t-i}+\varepsilon_{1,N,t}$$

Konya causality test results regarding the study are given in Table 8, 9, 10 and 11.

Table 8. Panel Konya Causality Test Results

Countries	GDPPC→Mental	GDPPC²→ Mental	Live→Mental	City→Mental
	Panel Stats	Panel Stats	Panel Stats	Panel Stats
	50.206***	50.372***	44.624***	70.058***
Brazil	1.407	1.554	3.897**	22.696***
Russia	17.303***	16.206***	7.422***	366.686***
India	4.411***	3.451**	1.186	7.416***
China	8.232***	9.474**	27.297***	7.329***
South Africa	4.726***	5.023**	7.911**	18.854***
Turkey	0.021	0.011	3.540	7.369**

Remark: ***, **, * marks denote 1%, 5%, and 10% significance levels for Bootstrap p-value, respectively. Bootstrap performed 10.000 replications.

Table 9. Panel Konya Causality Test Results (Continued)

Countries	Democ.→Mental	School→ Mental	Income Equal. →Mental	Birth→Mental
	Panel Stats	Panel Stats	Panel Stats	Panel Stats
	21.564**	12.197	19.214**	20.187**
Brazil	14.739***	6.197*	0.096	74.061***
Russia	0.325	0.103	0.092	0.140
India	0.815	1.094	15.009**	23.576***
China	0.319	1.425	11.983**	9.619***
South Africa	1.213	1.397	48.449***	7.327*
Turkey	9.441	3.640	12.668**	26.501***

Remark: ***, **,* marks denote 1%, 5%, and 10% significance levels for Bootstrap p-value, respectively. Bootstrap performed 10.000 replications.

Table 10. Panel Konya Causality Test Results (Continued)

Countries	Mental→GDPPC	Mental→ GDPPC²	Mental→Live	Mental→City
	Panel Stats	Panel Stats	Panel Stats	Panel Stats
	11.376	12.123	45.060***	23.450**
Brazil	0.532	0.562	3.937**	0.126
Russia	3.998	4.480	7.491***	5.416 *
India	10.642	10.711	1.171	2.915
China	0.046	0.044	26.723***	7.329***
South Africa	0.494	0.529	8.122***	2.475
Turkey	0.137	0.117	4.012	8.346**

Remark: ***, **, * marks denote 1%, 5%, and 10% significance levels for Bootstrap p-value, respectively. Bootstrap performed 10.000 replications.

Table 11. Panel Konya Causality Test Results (Continued)

Countries	Mental→Democ.	Mental→ School	Mental→Income Equal.	Mental→Birth
	Panel Stats	Panel Stats	Panel Stats	Panel Stats
	2.328	8.738	25.779**	11.538
Brazil	0.067	0.045	30.942***	15.619
Russia	0.060	0.342	0.239	2.877
India	0.219	0.025	0.047	3.046**
China	0.041	0.456	4.301	2.191
South Africa	1.059	0.672	0.230	0.069*
Turkey	0.302	0.288	13.261**	4.961

Remark: ***, **, * marks denote 1%, 5%, and 10% significance levels for Bootstrap p-value, respectively. Bootstrap performed 10.000 replications.

The Konya causality test results in the table were created according to the results of Wald and Fisher statistical values produced for each section in the panel and for the whole panel, respectively. The Wald test statistical values produced for each of the sections gain significance depending on whether the Bootstrap probability values are statistically greater than the critical values at 1%, 5% and 10% significance levels, respectively. According to the

Konya causality test results, it can be said that there are unidirectional and bidirectional causality relationships between mental illnesses and many of the other variables, both for the whole panel and for different sections. If the analysis is detailed, it has been observed that there is a one-way causality relationship between the first and second powers of per capita income and mental diseases, from income per capita to mental diseases at a statistically significant level of 1%. When evaluated in terms of cross-sections, a statistically significant 1% causality relationship was found from per capita income to mental diseases in BRICS member countries Russia, China, India, and the Republic of South Africa. It was observed that there was a bidirectional causality relationship between life expectancy at birth and mental illnesses at the 1% level of significance for the entire panel. When evaluated for the sections, it is observed that there is a statistically significant causality relationship of 1% for Russia and China, and 5% for Brazil and the Republic of South Africa. It has been determined that there is a two-way causality relationship between the number of people living in the city and mental illnesses for the whole panel, at a statistical significance level of 1% from the number of people living in the city to mental illnesses, and at a statistical significance level of 5% from the number of people living in the city to the number of people living in the city. When evaluated for the sections, it is observed that there are causal relationships from the number of people living in the city to mental illnesses, statistically at the level of 1% in Brazil, Russia, India, China, and South Africa, and at the statistical level of 5% in Turkey, while from mental illnesses to the number of people living in the city. Statistically, causality relationships were determined depending on the significance levels of 1% in China, 5% in Turkey and 10% in Russia. Another variable that has been tested for causality is the effect of democracy. It was observed that there was a one-way causality relationship between democracy and mental illnesses for the entire panel, from democracy to mental illnesses at a statistically significant 5% level. In the estimation for the sections, it can be stated that there is a statistically significant relationship at the 1% significance level only in Brazil. A mutual causality relationship can also be mentioned for another variable, income inequality. It was observed that there was a bidirectional causality relationship between income inequality and mental illnesses at a statistically significant 5% level for the entire panel. When evaluated for cross-sections, it was determined that there were causal relationships from income inequality to mental diseases statistically 1% in the Republic of South Africa, 5% statistically in India, China, and Turkey, while statistically 1% in Brazil from mental illnesses to income inequality. and in Turkey, causality relations were observed at 5% significance levels. Finally, it was determined that there is a one-way causality relationship between the birth rate per woman and mental diseases for the entire panel, from the birth rate per woman to mental diseases at a statistically significant 5% level. In the evaluations made for the sections, it was determined that there were causal relationships from the birth rate per woman to mental diseases at a statistically significant level of 1% in Brazil, India, China, and Turkey, and at a statistical significance level of 10% in the Republic of South Africa. From mental illnesses to the birth rate per woman, causality relationships were found at statistically significant levels of 5% in India and 10% in the Republic of South Africa. On the other hand, no causal relationship was found between mean schooling and mental illnesses for the whole panel, but when evaluated for the cross-sections, it was observed that there was a statistically significant 10% causality relationship from mean schooling to mental illnesses only in Brazil. Figure 6 shows the direction of the causal relationships of the variables.

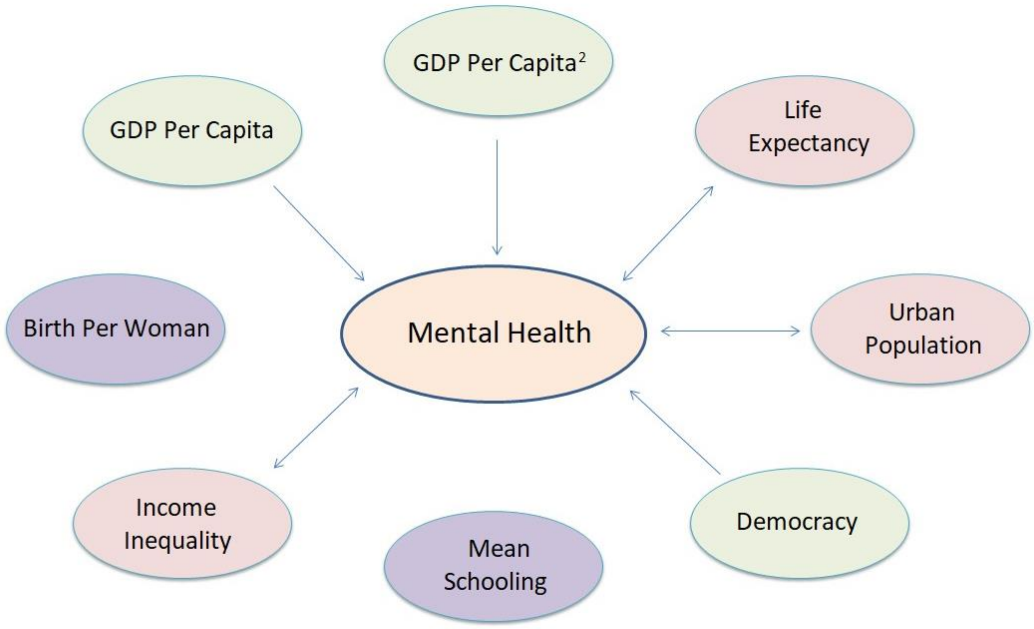

Figure 6. Direction of Causality Relationships

The diagrams in the Figure 6 show the direction of causal relationships between variables and mental illnesses. Accordingly, variables with unidirectional causality relationship with mental illnesses are shown in green charts, variables with bidirectional relationship are shown in red charts, and variables without a causal relationship are shown in purple charts.

5. DISCUSSION AND CONCLUSION

Mental diseases have been increasing rapidly in recent years and have become an important problem to be tackled for many developed and developing countries. Although genetic and environmental factors and problems in social relations have an important role in the spread of these diseases, it should be considered that socioeconomic factors also affect economic development processes as a threat to such diseases. The economic situation directly affects the social and psychological states of individuals and their relations with the environment. At this point, it can be argued that economic policies and naturally socioeconomic determinants have a serious effect on the mental health of individuals. At this point, focusing on the effects of mental illness in developing countries that have a large share in the global economy, beyond the effects of illness in developed economies with a certain threshold income level, makes the issue more important.

Focusing on possible mental illnesses that BRICS countries and Turkey may cause in these country groups due to the economic problems they experience, especially low per capita income level and income distribution compared to developed countries, can create a global area of activity and cooperation to combat such diseases. On the other hand, it can be thought that the determination of the effects of socioeconomic factors on mental diseases in developing economies will be of great importance both in terms of shedding light on future studies and in eliminating an important deficiency in the literature. In this direction, in the analyzes made on the BRICS countries and Turkey for the period between 1990 and 2019, it was determined that there is a structure expressed by the "U curve" between mental illnesses and income. In this context, it has been determined that mental diseases are at a higher level when the societies are at the underdevelopment level, and there is a decrease in mental diseases depending on the development process. When the development continued, it was determined that there was an increase in mental diseases this time. In other words, considering the employment in the social structure and the income structure accordingly, the share of the agricultural sector in underdeveloped societies is higher than the

other sectors and people make their own agricultural production. Along with the development process, the society evolves into industry; people become the labor force working in the production of others. When the same trend is continued, a situation emerges as the social structure evolves into the services sector this time; they are still in charge of their own affairs. It is possible to express the flow here with Clark's "three-sector law". Therefore, mental illnesses are at a higher level because the individuals in the society are predominantly in the agriculture and/or services sector where they are the managers of their own business; On the other hand, in a structure where they are industrial workers, it has been determined that there is a situation where mental illnesses remain at a lower level. Such a structure may indicate the existence of a signal that responsibilities regarding the conduct of one's own business will be a trigger for mental illness.

In addition to these relationships between mental illnesses and income, increases in life expectancy, increases in birth rates, negative democratization and income inequality are factors that increase mental illnesses; On the other hand, it has been determined that the increase in urbanization and schooling has a decreasing effect on mental diseases. In the causality tests, while income, square of income, average life, urbanization, democratization, income inequality and birth rates were found to be effective on mental illnesses, it was determined that schooling had no effect.

When the findings are evaluated as a whole, it can be said that while it is determined that the education of the individual against the risk of mental diseases and the fact of a livable city act as an antidote, it will be important to expand social programs that provide psychological support to individuals against the difficulties of self-employment and the accompanying economic life. It can be said that such practices are both a requirement of the social state understanding and will be important in terms of preventing the direct costs of unhealthy workforce such as unemployment and the indirect costs of health care costs and thus minimizing economic losses.

DECLARATION OF THE AUTHORS

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