RESEARCH ARTICLE

Türk Psikiyatri Dergisi 2024;35(3):167–177

https://doi.org/10.5080/u27179

Factors Related to Prevalence of Depression in Türkiye: A Population-Based Study

Nadire Gülçin YILDIZ[1], Kemal AYDIN[2], Halide Z. AYDIN[3], Yohane V. A PHIRI[4], Hatice YILDIZ[5]

ABSTRACT

Objective: This study aims to determine the prevalence of depressive symptoms in the adult population in Türkiye and to examine the relationship of depression with socio-demographic and behavioral variables and chronic diseases.

Method: This sturdy utilized data from the 2019 Turkey Health Survey. The Patient Health Questionnaire Depression Module (PHQ-8) was employed to assess depressive symptoms in the survey. Based on the analysis using the diagnostic algorithm of the PHQ-8, from a total of 17084 people aged 15+ years old who were, we selected 6.4% individuals with depressive symptoms. Then, we randomly selected 1101 individuals without depressive symptoms, comprising of a total of 2202 individuals as the study sample. We assessed the factors associated with depressive symptoms using multivariate logistic regression analyses.

Results: The risk of developing depressive symptoms increased with age. Women were more likely to report depressive symptoms. Education, physical activity, and marital status were negatively correlated with reporting depressive symptoms. Further, social support was a protective factor to report depressive symptoms. The presence of chronic diseases was positively associated with depressive symptoms.

Conclusion: The results showed that point and annual prevalence of depressive symptoms were high. The findings provide a basis for further studies to explore the factors associated with a higher prevalence of depressive symptoms in Türkiye. Our findings could serve as a reference to monitor depression in the country, as well as help in the planning of health resource and identify high risk segments of the population.

Keywords: Depression, Socioeconomic and Demographic Factors, Physical Activity Questionnaire (IPAQ), Oslo-3 Social Support Scale (OSSS-3), Diabetes, Hypertension, Coronary heart Disease, Low Back Pain

INTRODUCTION

Depression is a recurrent, chronic disease prevalent worldwide that causes a serious amount of labor loss (Kılıç and Uluğ 2021). It is defined as a syndrome characterized by deep sadness, physiological, cognitive and mental stagnation and retardation, feelings and thoughts of inferiority, worthlessness, pessimism and reluctance (Çam et al. 2004). Depression is a major cause of disability that increases the risk of premature death, reduces quality of life and places a serious burden on health systems (WHO 2013).

Today, it affects all age groups in all countries, causing harm to not only those who suffer from it but also families and societies (Medeni et al. 2020). It is also a significant public health problem as it causes labor loss and disability on individual scale and social and economic issues on social scale. It is among the most common causes of disability after cancer (Açıkgöz et al. 2018).

It is seen that in addition to genetic susceptibility, researches on demographic and socioeconomic factors such as economic condition, education, unemployment, gender and age; environmental factors such as war, psychic trauma and migration; factors dependent upon lifestyle choices such as obesity, physical activity and use of tobacco are conducted. It is noted in studies on the etiology of depression that rather than one risk factor, the negative interactions and timing of

Received: 31.05.2022, **Accepted:** 02.11.2022, **Available Online Date:** 19.11.2023

[1]Assoc. Prof., Medipol University, Department of Guidance and Counseling, Faculty of Education, İstanbul, Turkey; [2]Prof., Amasya University, Faculty of Economics and Administrative Sciences, Merzifon, Turkey; [3]Psychologist, University of South Caroline, Health Promotion, Education and Behavior, Colombus, USA; [4]Psychiatrist, Taipei Medical University, School of Public Health, Public Health and Environmental Epidemiology, Taipei, Taiwan; [5]MD., Medipol University, Health Sciences Institute, İstanbul, Turkey.

e-mail: ngyildiz@medipol.edu.tr

risk factors mentioned above play a critical role (Kılıç and Uluğ 2021).

Studies on depression, in relation to demographic, socioeconomic, behavioral states and family history, both within Türkiye and the world show differing results; however, it is observed in nearly all studies that the prevalence of depression is higher in women (Keskin et al. 2013, Binbay et al. 2014, Etiler 2015). Usually, various risk factors such as age (Kavakçı et al. 2011), low income and educational attainment (Ünal and Özcan 2000), unemployment (Yüksel 2003), marital status, lack of social support, family history, personality traits and physical illnesses are progenitors of major depression and affect the outcome of the disorder (Kaya 2007, Binbay et al. 2014).

In Türkiye, studies on depressive disorders are conducted on set parts of the population such as pregnant women, the elderly, university students and healthcare providers; however, studies representing the entire population are quite limited (Maral et al. 2001). The last study representing the whole population, Turkey Mental Health Profile Report, was conducted in 1995-1996 (Erol et al. 1998). This report is a survey of 7479 people, and it has been 25 years since it was conducted, within which many changes that have the possibility of affecting mental health both positively or negatively had occurred. In this study, which was the first and only national psychiatric epidemiology study in Türkiye, the rate of mental illness was 17.2%. In the same study, the prevalence of depressive episodes was found to be 4%. Prevalence rates were recorded as 5.4% in women and as 2.3% in men (Erol et al. 1998).

In Chronic Diseases and Risk Factors Survey in Turkey conducted by the Ministry of Health in 2013, some important findings on mental health representing the population registered with family physicians were presented. According to this study, the prevalence of depression was found to be 9%, somatization disorder 5%, and panic disorder 2% among the patient population declared to have been diagnosed by a physician Türkiye. Disorder rates have been reported to be higher in women and the elderly (Ünal and Ergör 2013).

Health surveys have been conducted periodically since 2008 in 27 European Union countries and United Kingdom, Norway, Iceland and Türkiye (EUROSTAT-a 2022). The survey, named *The European Health Interview Survey (EHIS)* has been translated as 'Türkiye Health Survey' and is periodically conducted in Türkiye. Türkiye Health Survey consists of four modules: health status, health service utilization, health determinants and socioeconomic background. The main objective of this survey is to monitor the health of Türkiye's population by collecting data on a wide range of health topics such as medical conditions, doctor's appointments, physical activity and other behaviors related to health (TURKSTAT 2019). Such information on the health status of general population may provide critical information for both health projections and related public health policies (Yılmaz 2017). Therefore, Türkiye needs to consider potential threats against health systems in the scope of health transformation policies (Atun 2015).

Issues pertaining to health cause higher medical costs and a significant loss of labor (Melton 2019). Vigo et al. (2016) argue that the global burden of psychological and psychiatric illnesses is underestimated if based solely on health reports and statistics, and that 32.4% of the years lived with disability worldwide are due to illnesses such as depression. T.R. Ministry of Health General Directorate of Health Services database reports that between 2013 and 2016, the average length of stay in hospitals for mental and behavioral disorders was approximately four times higher than other categories (Ministry of Health 2017).

Depression is associated with a significant individual and societal burden of disease (Wittchen et al. 2011). Individuals with significant depression have reduced quality of life and productivity (WHO 2018). Evidence-based comparisons of national prevalence of depression between other European countries are very limited.

Türkiye Health Survey includes the *Patient Health Questionnaire Depression Module (PHQ-8)*, an instrument developed according to the *Diagnostic and Statistical Manual of Mental Disorders (DSM) IV* to assess the prevalence and levels of depression in general population. This module is used in population-based surveys and large clinical trials to measure the diagnosis and severity of depression (EUROSTAT-b 2022). The PHQ-8 is a widely used module whose validity and reliability have been established in both the international literature (Kroenke et al. 2009) and in Türkiye (Güleç et al. 2012, Kaymaz et al. 2021).

Although there are publications within which the PHQ-8 module of this questionnaire is used in Germany (Maske et al. 2016, Hapke et al. 2019), England (Arias de la Torre et al. 2021), France (Hémar et al. 2022), Italy (Barone and Barra 2021), Spain (Arias-de la Torre et al. 2018) and other countries, there is no study conducted in as per our literature review. In these publications, the relationship between demographical, socioeconomic and behavioral factors (obesity, physical activity etc.) and depression was analyzed. The results vary from country to country; however, depressive symptoms are more common among women in all countries. Depression is most common in middle age in both men and women, and socioeconomic disadvantage is strongly associated with depression.

In this study, we aim to determine the prevalence of depression and depressive symptoms in the adult population aged 15 years and older in Türkiye, and to analyze the relationship between depression and demographic, socioeconomic, behavioral and

common chronic diseases via analyzing microdata from the most recent Türkiye Health Survey conducted in 2019.

METHOD

Data

In this study, microdata from the most recent Türkiye Health Survey conducted in 2019 was used. Türkiye Health Survey is a cross-sectional household survey regularly conducted by the Turkish Statistical Institute. Türkiye Health Survey is conducted through a multistage probability sampling design which covers provinces, districts, and towns in 12 regions. Study population comprises of 17084 adults aged 15 and above in 9470 households to represent Türkiye as a whole. Trained TURKSTAT staff conducted face-to-face interviews in each selected households via computer-assisted personal interview technique. In the survey, the population characterized as institutionalized (military, permanent residents in dormitories, prisons, hospitals, nursing homes, etc.), and small settlements (small villages, temporary settlements, hamlets, etc.) where a sufficient number of sample households cannot be reached were excluded. Details on sampling and data collection procedures are available online (TURKSTAT 2019).

This research is a systematical analysis that can shed light on national requirements via identifying the present condition of prevalence of depression and enables international comparisons. With the Health Survey, many indicators in the field of health are obtained, including the health status of infants, children and adults, as well as the health status of individuals aged 15 and over, their utilization of health services, prioritization, mental health, the degree of difficulties they experience in performing daily activities, smoking and alcohol habits (TURKSTAT 2022). Turkish Statistical Institute provides anonymized data following an agreement on the security and accessibility of the data. As the data used are publicly available, ethical approval is not required for this study.

Variables and Measurement

In this article, depression symptoms defined in the Patient Health Questionnaire (PHQ-8) are used as indicators of depression. Socioeconomic and behavioral factors such as gender, age, marital status, educational attainment, chronic diseases, obesity and physical activity comprise the independent variables which are thought to be associated with the symptoms and prevalence of depression.

The PHQ-8 self-assessment module, which consists of eight Likert-type items, measures the frequency of depressive symptoms in the last two weeks. The eight items in the module cover, in order and in the last two weeks, the frequency of having little interest and enjoyment in doing things, depression, sleep problems, fatigue, loss of appetite, feeling worthless, poor concentration and restlessness. The responses differ between never (0), some days (1), more than one week (2) and almost every day (3). In PHQ-8 model, the lowest point is set as zero, the highest is set as 24. In international measurements and developmental studies of the PHQ-8, the sum of scores (PHQ-8: 5-9) is defined as mild depressive symptoms, (PHQ-8: 10-14) as moderate severity and (PHQ-8≥15) as severe depressive symptoms (Kroenke et al. 2009). The cutpoint of this module is 10. In international measurements, a total score of 10 or more is considered a positive diagnosis of depression (PHQ-8≥10). In this study, depression scores are measured by calculating the PHQ-8 algorithm by the measures above and those with a PHQ-8 score of 10 and above were diagnosed as having depressive disorder (PHQ-8≥10).

Age categories for individuals aged 15 years and above were classified into seven categories: 15-24, 25-34, 35-44, 45-54, 55-64, 65-74 and 75+. Education level was coded in four categories: primary school and below, secondary school and equivalent, high school and equivalent, university and above. Türkiye Health Survey includes information on general health and chronic diseases of individuals aged 15 and above. In order to examine the relationship between depressive symptoms and chronic low back (low back pain, herniated disc and other low back defects), hypertension, neck (neck pain, herniated disc and other neck defects), diabetes mellitus and coronary heart disease (angina, chest pain, spasm), which are highly prevalent in our country, these chronic diseases were included in the analysis. For example, in Türkiye Health Survey, the responses to the question "Have you had diabetes in last 12 months?" are registered as yes or no. In binary logistic regression analysis, those without chronic diseases were used as control variables and the relationship between chronic diseases and depression was analyzed.

Türkiye Health Survey includes the short version of *International Physical Activity Questionnaire-IPAQ* which is comprised of 8 items. In this module, the participants recorded how much time they spent daily on walking, cycling, sports, fitness and muscle strengthening through a self-assessment questionnaire. In line with IPAQ measurements, daily activity categories were calculated by converting into minutes the time spent on these activities and multiplying the resulting number with MET (metabolical equilavent of a task) values. MET is a way to compare different types of activities by their consumption of energy (EUROSTAT-b 2022). Özkeskin and Özden (2022) applied the short version of this module in Turkish on young adults, concluding that the module is both valid and reliable. Activities, which were recorded as hours in Türkiye Health Survey are converted into minutes; light activities such as walking were multiplied by 3.3 METs, activities of moderate intensity such as bicycling were

multiplied by 4 METs, and energy-intensive activities such as sports, fitness and muscle strengthening were multiplied by 8 METs and total scores were obtained (Finger et al. 2015).

As a result of these calculations, those who scored at least 600 METs were classified as mildly (minimally) active; those who score at least 3000 METs through walking 5 days or more in a week and doing moderate or intense activities were classified as moderately physically active; and those who scored 3000 METs and above in all of the activities were classified as highly active. Those who scored below 600 METs were classified as inactive (Sjostrom et al. 2005).

By calculating body mass index with weight and height measurements in the questionnaires, three groups were formed -normal weight (18.50 ≤ BMI <25), overweight (25.00 ≤ BMI <30) and obese (BMI ≥ 30) . Due to the low proportion of participants classified as 'underweight' (3.4%), underweight and normal weight categories were combined and expressed as normal weight at the analytical stage.

Türkiye Health Survey also includes an another module consisting of 3 questions and is named *Oslo 3 Social Support Scale (OSSS-3)*. This module assesses social support scale in three articles and is recommended for epidemiological and population-based studies (EUROSTAT-b 2022). The items in the module are as follows: The first article, "How many people are so close to you that you can count on them if you have great personal problems?" with options listed as 1. none, 2. one-two, 3. three-five, 4. six or more. The second article, "How much interest and concern do people show in what you do?" with options listed as 1. none, 2. little, 3. uncertain, 4. some, 5. a lot. The third article, "How easy is it to get practical help from neigbors if you should need it?", with options listed as 1. very difficult, 2. difficult, 3. possible, 4. easy, 5. very easy. In OSSS-3 module, the lowest score is 3 and the highest score is 14. After summing the scores, those with a total score between 3-8 were classified as having poor social support, 9-11 as having moderate social support, and 12-14 as having strong social support (Kocalevent et al. 2018, Sánchez and Gallardo 2022). In this study, *OSSS-3* module was calculated and its relationship with depression is included in the analysis.

Statistical Techniques Used in Analysis

As mentioned above, Türkiye Health Survey is conducted with a total of 17084 adults (aged 15 and above) in 9470 households and is set to represent Türkiye. In view of our algorithmic calculations, the total number of people with a depressive symptom score of 10 or above in this survey is 1101 (6.4%), and according to 2019 data, the point prevalence of depression in Türkiye were 6.4%. Since the aim of the study was to determine the variables that would affect the presence of depression, individuals with depression (1101) were filtered from 2019 TURKSTAT data, the same number of people (1101) were randomly selected from those who did not show depression and included in the sample. Since the dependent variable is (0/1), multivariate binary logistic regression model was employed as the regression model. The independent variables were gender, age, marital status, education level, obesity, physical activity, Oslo 3 (OSSS-3) social support module and chronic low back, hypertension, chronic neck, diabetes and coronary heart diseases. In the tables below, the frequency analyses of the independent variable are presented in detail.

SPSS 25 package program was used to analyze the data.

RESULTS

According to the scores in Patient Health Questionnaire (PHQ-8) of people who have participated in the study throughout Türkiye, depressive symptoms were not found in a total of 12421 in 17084 people (72.7%). According to scale scoring (PHQ-8: 5-9), 3.562 (20.8%) people had mild depressive symptoms, 563 (3.3%) had moderate depressive symptoms and 538 (3.1%) had severe depressive symptoms. While 24.9% of women had mild, 4% moderate and another 4% severe depressive symptoms, 16%, 2.5% and 2.2% of men had mild, moderate and severe depressive symptoms, respectively. In the frequency analysis of the items in the module, the two most common depressive symptoms in Türkiye were found to be sleep problems and fatigue. Mild symptoms were not included in the analysis as the cutpoint of the module was defined as 10 and above.

Frequency analyses showed that depression was more prevalent in women, people aged 65 and over, unmarried people (single, divorced and widowed), people with primary school education or less, people with poor social support and people with hypertension, coronary heart disease, diabetes and low back problems, which are common in Türkiye.

In the Türkiye Health Survey, a single question "Have you experienced depression in the last 12 months?" was also asked. According to the results of this single-question assessment, the prevalence of yearly depression was 10.1%. 13.2% of women and 6.1% of men have stated that they had experienced depression in the last year.

Demographical Characteristics

Demographic characteristics of the sample are shown in Table 1. Female participants constituted 58.1%, male participants constituted 41.9% of the sample pool.

In age groups, the 15-24 group was 22%, 25-34 group 26.8%, 35-44 group 21.1%, 45-54 group 9.3%, 55-64 group 8%, 65-74 group 6.8% and 75+ group 5.9%. In terms of marital status, 31.7% were unmarried, 56.1% were married, 3.6% were widowed and 8.6% were divorced. In terms of educational attainment, primary school and below accounted

Table 1. Frequency and Percentage Table of Demographic Characteristics of the Sample

		n	%
Gender	Male	922	41.9
	Female	1280	58.1
Age groups	15-24	485	22.0
	25-34	590	26.8
	35-44	464	21.1
	45-54	205	9.3
	55-64	177	8.0
	65-74	150	6.8
	75+	131	5.9
Marital Status	Never married	697	31.7
	Married	1235	56.1
	Divorced	80	3.6
	Spouse deceased	190	8.6
Educational attainment	Primary and below	908	41.2
	Primary or equivalent	427	19.4
	High school or equivalent	432	19.6
	University and above	435	19.8

for 41.2%, secondary school and equivalent for 19.4%, high school and equivalent for 19.6%, and university and above for 19.8%.

Information on health status, frequency and percentage of the sample is presented in Table 2.

Table 2 shows that the participants' perceived general health status was 6.7% very good, 45.0% good, 26.8% normal, 16.4% bad and 5.1% very bad. In physical activity scoring, inactivity rate was 19.1%, minimal activity rate was 41.2%, moderate activity rate was 29.7%, and high activity rate was 9.9%. According to Body Mass Index measurements, 46.5% of the participants were normal weight, 32.4% were pre-obese and 21.1% were obese. In the social support variable, it was seen that 29.4% of the participants received weak, 56.1% received moderate and 14.4% received strong social support.

Table 3 summarizes some of the chronic diseases that are common in the population on an annual basis: In the sample, 19.8% of the respondents stated having hypertension, 39.3% low back disease, 31.3% neck disease, 13.1% diabetes and 14.2% reported coronary heart disease.

To determine the variables affecting depression, multivariate binary logistic regression analysis was employed. In order for the logistic regression algorithm to work, the group (with/without depression) was equally represented in the predicted variable. As there were 13 independent variables, the sample size in logistic regression has to be at least 10 times the number of independent variables. The number of participants in the sample (2202) was well above this number. In order to predict depression, variables other than the age variable, which is a numerical measurement of independent variables, were categorized and the odds ratio (OR) was used to determine how many times more depression was observed throughout categories.

As *Hosmer-Lemeshow Test* ($p>0.05$) is applied for the validity of the model, the model is considered valid. In the analysis, the rate of independent variables explaining depression was found to be 65% according to *Nagelkerke* R^2 and 48% according to *Cox Sinell* criterion. The success of the model in separating participants with and without depression was 89.1% in total. The success rate for classifying those with depression was 79.2%, while the success rate for classifying those without depression was 84.2%. Table 4 presents the results of the multivariate binary logistic regression analysis and summarizes the findings.

In Table 4, male, university and higher education level, married participants, very good general health status, inactive, poor social support, normal weight and presence of chronic diseases were used as control variables. Gender, age, education level, marital status, physical activity, general health status, social support variables and coronary heart disease, hypertension, diabetes and low back diseases were significant ($p<0.05$) in determining the presence of depression. Obesity levels and chronic neck pain variables were not significant ($p>0.05$).

As shown in Table 4, the risk of depression was 1.517 times higher for women than for men in the gender variable. Although the prevalence of depression varies by country, aided also with a variety of factors, the fact that depression is observed more in women does not vary.

Table 2. Health Status Information, Frequency and Percentage Table of the Sample

		n	%
General health status	Very good	148	6.7
	Good	990	45.0
	Normal	590	26.8
	Bad	361	16.4
	Very bad	113	5.1
Physical Activity (IPAQ)	Inactive	421	19.1
	Minimally active	908	41.2
	Moderately active	654	29.7
	Highly active	219	9.9
Obesity	Normal weight	1023	46.5
	Overweight	714	32.4
	Obese	465	21.1
Social support (OSSS-3)	Poor social support	648	29.4
	Moderate social support	1236	56.1
	Strong social support	318	14.4

IPAQ: International Physical Activity Questionnaire, OSSS-3: Social Sport Sacle (OSSS-3)

Table 3. Common Chronic Diseases in Sample

		n	%
Hypertension	No	1767	80.2
	Yes	435	19.8
Chronic low back pain	No	1336	60.7
	Yes	866	39.3
Chronic neck diseases	No	1513	68.7
	Yes	689	31.3
Diabetes	No	1914	86.9
	Yes	288	13.1
Coronary heart disease	No	1889	85.8
	Yes	313	14.2

With the age variable, the risk of depression increases by 1.089 times with one point increase. Therefore, as the age increases, the risk of depression meaningfully increases. According to our findings, the prevalence of depression in Türkiye was 4-5% in the 40s, increases to approximately 6-7% in the 50-64 age group, and increases to 12-15% in people aged 65 and over.

Marital status appears to be an effective variable in the risk of depression. When married people were set as the main group in the marital status variable, never-married people were 1.982 times, divorced people were 1.814 times, and widowed people were 4.95 times more likely to be depressed than married people.

In the educational attainment variable, when compared to the university and above base group, it was seen that high school and equivalent graduates had 2.125 times, school and equivalent graduates had 3.131 times, primary school and below group had 2.191 times higher risk of depression. Low educational attainment appears to be a risk factor for depression in studies done both Türkiye and in other countries.

When the relationship between physical activity levels and depression is considered, a negative relationship was found. Those minimally active were 0.439 times less likely to be depressed than those who were never active, those moderately active were 0.468 times less likely to be depressed than those never active, and those very active were 0.527 times less likely to be depressed than those never active.

However, this does not mean that the depressive symptoms would continually decrease as the physical activity levels increase. As a result and as is pointed out by p values, even minimal activities such as a half-hour walk, which equates to a value above 600 METs, create a meaningful difference. Certain levels of physical activities were significantly effective in the prevention and prognosis of depression (Neslihan and Bademli 2017, Başar 2018). Also, the beneficial effects of activities such

Table 4. Predicting the Risk of Depression with Multivariate Logistic Regression Analysis

	B	p	OR	95% CI for OR	
				Lower	Upper
Gender					
Female	0.416	0.002**	1.517	1.162	1.979
Age	0.084	0.000**	1.088	1.070	1.106
Educational Attainment					
University and above		0.000**			
High school or equivalent	0.754	0.000**	2.125	1.461	3.090
Secondary or equivalent	1.141	0.000**	3.131	2.137	4.589
Primary and below	0.784	0.000***	2.191	1.508	3.184
Marital Status					
Married		0.000**			
Never married	0.684	0.000**	1.982	1.411	2.784
Divorced	0.596	0.084	1.814	0.923	3.568
Widowed	1.599	0.020**	4.950	1.291	18.973
General Health Status					
Very good		0.000**			
Good	0.602	0.056	1.827	0.986	3.385
Normal	1.764	0.000**	5.837	3.051	11.168
Bad	2.626	0.000**	13.812	6.170	30.916
Very bad	19.995	0.995	48292.226	0.000	.
Physical Activity					
No activity		0.002**			
Minimal activity	-0.824	0.000**	0.439	0.285	0.675
Moderate activity	-0.759	0.001**	0.468	0.300	0.731
High activity	-0.640	0.022*	0.527	0.305	0.910
Social Support					
Weak social support		0.000**			
Moderate social support	-0.570	0.000**	0.565	0.427	0.749
Strong social support	-0.139	0.491	0.870	0.586	1.292
Obesity Rate					
Normal weight		0.315			
Pre-obese	-0.227	0.132	0.797	0.593	1.071
Obese	-0.143	0.442	0.867	0.601	1.249
Coronary heart disease	0.515	0.034*	1.674	1.041	2.693
Hypertension	0.636	0.017*	1.890	1.119	3.192
Diabetes	0.656	0.026*	1.927	1.080	3.438
Chronic low back pain	0.505	0.001**	1.657	1.237	2.219
Chronic neck pain	0.075	0.646	1.077	0.784	1.481

**p<0.01 *p<0.05 Nagelkerke R^2=0.653 Hoshmer and Lemeshov Test p value =0.541.

as walking, bicycling, sports and fitness that are done in regular intervals on general health and metabolism are known.

The group who have stated their general health condition as good were 1.827 times more likely to suffer from depression than those who stated their general health condition as very good; in line with this, those who had stated their general health condition as bad was 13.812 times more likely to suffer from depression than those who stated their general health condition as very good. In view of the analysis' results, depression is a significant risk factor in health perception. Depression causes a decrease in the perception of the individual's rule over their own health, causes a variety of aches and thus leads to a low perception of health.

Results also show that having people to turn when needed is protective against depressive symptoms. In the social support variable, those with moderate social support were 0.565 times less likely to be depressed than those with weak social support; and those with strong social support were 0.870 times less likely to be depressed than those with weak social support. Poor social support is linked to loneliness and depression and has been found in other studies that it increases the risk of premature death.

Regarding the relationship between obesity and depression, there are studies suggesting that obesity is often a source of depression among adolescents, young adults and women. Obesity worsens body image in individuals, leading to dissatisfaction regarding appearance and health problems. It has been pointed out that there is a vicious circle between obesity and depression; depression is a risk factor for obesity and vice versa (Luppino et al. 2010). While the majority of other studies conducted in Türkiye find that obesity and depression trigger each other (Çakmur and Güneş 2018, Ardıç 2020), a meaningful relationship between obesity levels and depression could not be found within the analyses of this study. However, more public health research are needed regarding this topic.

As a result of analyses, it was observed that those with coronary heart disease had 1.674 times higher risk of depression than those without. Individuals with chronic hypertension were 1.890 times more likely than those without, and those with diabetes were 1.927 times more likely to have symptoms of depression than those without. Individuals with chronic low back conditions (low back pain, herniated disc and other back defects) were 1.657 times more likely to have symptoms of depression than those without. However, no relationship between neck pain and risk of depression was observed in analyses.

DISCUSSION

In relation to demographic factors, the number of studies based on population is less than those conducted with clinical or particular parts of the population. Since 2008, population-based data is obtained through Türkiye Health Survey. Depending on the data collected by TURKSTAT, short summaries are published; however, studies that include detailed analyses of microdata are quite few in number. Depression, both individually and socially, is one of the most taxing and prevalent mental disorders. Changing demographical features, birth and death rates, infertility, population growth rates between races, ethnicities and local regions, expectancy of health, population density and other factors affect health systems on a global scale. The results of this study have presented the means to analyse the prevalence of depression throughout Türkiye's adult population in view of demographical factors and a way to analyze the relationship between depression and personal/social factors. To our knowledge, this is one of the most recent studies to analyze the distribution of depression and related factors using primary representative data from the general population in Türkiye.

According to the 2019 Türkiye Health Survey, the annual prevalence of depression in Türkiye was 10.1% and the point prevalence (PHQ-8≥10) was 6.4%. In a broader generalization where those with a PHQ-8 score of 8-9 with mild symptoms are also taken into account, the point prevalence of depression in Türkiye can be estimated to be between 6% and 8%. These results show that the prevalence of depressive symptoms is high in Türkiye and that it is associated with socio-demographic factors and chronic diseases. The results show that depression has become a public health issue and is among the top five most common chronic diseases in terms of annual distribution, with low back problems (29.7%), neck problems (20.5%), hypertension (16.4%) and diabetes (10.2%).

In Türkiye, depression increases concurrently with age and is more common in women than in men, as is the case worldwide. In Türkiye, the point prevalence of depression by age group is approximately 4-5% in the 40s, 6-7% in the 50s-64s and 12-15% in the 65s and over. In terms of educational attainment, it is less common among those with university education and above, excluding other education levels.

The results of this study show that marital status provides psychological support against depression in Türkiye, in other words, it increases the resilience of the individuals. According to our findings, unmarried and divorced individuals have approximately twice the risk of depression compared to married individuals. Widowed people are about five times more likely to suffer from depression than married people. It has been documented in international literature that never married, divorced, widowed and separated individuals have a higher risk of depression compared to married individuals (Barrett 2000, Pan et al. 2022). Several recent longitudinal studies have shown that marriage is associated with increases

in psychological well-being and decreases in psychological distress. On the other hand, it is also known that marriages with too much tension, disagreement and domestic violence lead to depression (Özyurt and Deveci 2010).

Even walking for at least 30 minutes a day, which corresponds to a minimal level of physical activity (600 METs), is protective against depressive symptoms. In terms of mental health, social support plays an important role in our daily lives. People get through their hard times only with the support of other people around them. Having an adequate social support network is protective against hardships of life and increases the resilience of the individual. However, social support is not one-sided. In the same manner, the relationship between depression and diseases such as hypertension, diabetes and coronary heart diseases is not one-sided; it has been observed in other studies that one triggers the other. The combination of all these symptoms affects health status and leads to a negative perception of health.

The analysis shows that the risk of depression is 1.674 times higher in those with coronary heart disease compared to those without. On the other hand, there are many studies showing that depression causes the development of cardiovascular diseases. In a 10.8-year follow-up, a 1.81-fold increased risk for coronary artery disease was found in depressed patients (Altunbaş et al. 2012). Hypertension is a very common health problem in our country and the world. People with chronic hypertension are 1.890 times more likely to have symptoms of depression than those without. Other clinical and public health studies have also found that those with hypertension are more likely to experience mood problems such as anxiety and depression than those without (Meng et al. 2012, Kayir and Öztekin 2022).

Depression is also known to be associated with the incidence of physical illnesses. According to our analysis, participants with chronic diabetes had about twice the risk of developing depression compared to those without. In many other clinical studies, it has been reported that diabetes and depression are interconnected and in recent studies, it has been found that 67.3% of patients with diabetes have a risk of developing depression (Sayın et al. 2019). Obesity and a sedentary lifestyle stand out as two of the most common causes of diabetes, although not in all diabetic patients.

According to the Türkiye Health Surveys, the most common chronic disease in Türkiye is low back problems (low back pain, herniated disc and other back defects). According to the results of the Türkiye Health Survey in 2019, the annual distribution of low back problems in Türkiye was 29.7%, with 22.6% being in men and 36.6% in women. It is therefore deemed important to analyze the relationship between this most common problem and depression. As seen in the analysis, individuals with chronic low back problems are 1.657 more likely to show symptoms of depression than those without low back discomfort.

Studies have shown that although low back pain can lead to depression, depression can also cause low back pain (Carrol et al. 2004, Ay and Evcik 2008, Uçar et al. 2011, Cankurtaran and Yığman 2022). On the other hand, it is observed that the prevalence of neck area problems is 20% in our country. However, in our analysis, no relationships were found between neck area problems and depression.

The following limitations should also be taken into consideration when interpreting the results of this study. Since the analyses are cross-sectional and based on self-assessment, they are correlational rather than causal. Analyses are cross-sectional and insufficient to estimate longitudinal relationships. Although the PHQ-8 is an internationally validated tool with established validity and reliability, it should not be taken in the same regard as a physician's diagnosis. It is recommended that clinical evaluations of such analyses should also be conducted at the longitudinal level employing different data sources. In addition, the results of this study are in line with studies conducted in Türkiye regarding special population groups and at the clinical level.

When the same module is compared throughout European Union countries and Türkiye, it is seen that the rates and patterns are close to each other. The results of the Türkiye Health Survey not only reflect the country as a whole, but also allow for international comparisons since the same version of the survey is also applied in European Union countries. In Türkiye, the point prevalence of depression according to the PHQ-8≥10 scale is 6.4%, whereas it is 9.2% in Germany, 7.4% in United Kingdom, 7.2% in France, 8.8% in Sweden, 4.6% in Italy, 4.8% in Poland, 4.3% in Austria, 4.9% in Romania, 2.9% in Slovakia and 2.7% in the Czech Republic (Hapke et al. 2019). Depression is more prevalent among the elderly in countries such as Türkiye, Portugal, Italy and Romania, while it is more prevalent among young people in Germany. Although the results vary across the European Union countries, the prevalence of depression in 25 European Union countries is 5.2% in men and 7.9% in women, with an overall average of 6.6%. Compared to the European Union countries, Türkiye is within the average of the European Union countries with 6.4%.

In summary, these results may create a basis upon which more advanced studies on existing depressive disorders and their symptoms could be conducted. Given the representativeness of the sample, these results can serve as a reference for monitoring depression in Türkiye, planning health resources and developing preventive and screening strategies targeting identified high-risk population groups.

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