

Multi-Dimensional mental health sector workforce analysis: Comparison between european region countries

Çok boyutlu mental sağlık sektörü iş gücü analizi: Avrupa bölgesi ülkeleri arasında karşılaştırma

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ABSTRACT

Aim: The aim of this study is to compare and determine the position of Turkey and other European countries in a graphical plane, divide countries into subgroups and see similarities and differences relative to each other according to the mental health sector workforce indicators. Also, we aimed to discuss the role of social work profession in mental health sector. **Material and Methods:** We used four different mental health workforce indicators for 29 European Countries for the year 2016 or the nearest from WHO Mental Health Database. We performed Multi-dimensional Scaling (MDS) technique to compare countries and determine positions by obtaining table of coordinates, differences matrix and euclidean distance model. We utilized SPSS 20.0 package program. **Results:** Belgium, Germany, the Netherlands, Norway, Sweden, Finland and France have both positive and over 1 value in table of coordinates and these are different from other countries. Also, Turkey is the similar to Russia, Croatia, Hungary and Slovenia mostly and is the most different, respectively, from Norway, the Netherlands, Germany and Spain in terms of mental health sector workforce. In addition, Turkey (VAR24) was located somewhere away from the general trend in the euclidean distance model. **Conclusion:** In Turkey, the need for mental health sector workforce especially in; social work, psychiatry and psychology professionals, is still high when compared with other developed countries such as Norway, Sweden.

ÖZET

Amaç: Bu çalışmanın amacı, mental sağlık sektörü işgücü göstergelerine göre, Türkiye ve diğer Avrupa ülkelerinin grafik düzlemdeki konumlarını belirlemek ve karşılaştırmak, ülkeleri alt gruplara ayırmak ve birbirlerine göre benzerlik ve farklılıkları görmektir. Ayrıca mental sağlık sektöründe sosyal hizmet mesleğinin alanını tartışmaktır. **Gereç ve Yöntemler:** Çalışmada 2016 yılı ya da en yakın yıl için 29 Avrupa Ülkesi için dört farklı mental sağlık işgücü göstergesi kullanıldı. Ülkeleri karşılaştırmak ve konumları belirlemek için koordinatlar tablosu, farklılıklar matrisi ve Öklid uzaklık modelini içeren Çok Boyutlu Ölçekleme (MDS) tekniği uygulandı. Analizlerde, SPSS 20.0 paket programı kullanıldı. **Bulgular:** Belçika, Almanya, Hollanda, Norveç, İsveç, Finlandiya ve Fransa koordinat tablosunda hem pozitif hem de 1'den fazla değere sahiptir ve bunlar diğer ülkelerden farklıdır. Ayrıca, Türkiye mental sağlık işgücü göstergeleri açısından en çok Rusya, Hırvatistan, Macaristan ve Slovenya ile benzerdir sırasıyla Norveç, Hollanda, Almanya ve İspanya'dan ise farklıdır. Buna ek olarak, Türkiye (VAR24) öklid uzaklık modelindeki genel eğilimden uzakta bir yerde konumlanmıştır. **Sonuç:** Türkiye'de, mental sağlık sektörü işgücüne duyulan ihtiyaç özellikle; sosyal hizmet, psikiyatri ve psikoloji alanlarında, Norveç ve İsveç gibi diğer gelişmiş ülkelerle karşılaştırıldığında hala yüksektir.

INTRODUCTION

Mental ill-health is receiving attention in the psychiatric literature in recent years. However, there have been rare studies on mental health sector workforce -social worker, psychologist, psychiatrist and nurse- especially in the focus of social work. Mental health is now regarded as one of the main significant causes off ill-health and mental disability (1). World Health Organization (WHO) defines mental health as a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to

make a contribution to his or her community (2). The WHO stresses that mental health is not just the absence of mental disorder. Mental health is a positive concept related to the social and emotional wellbeing of people and communities, like physical health, mental health is not fixed, it exists on a continuum, or range: from positive, healthy functioning at one end through to severe symptoms of mental health conditions at the other (3).

According to World Health Organization (WHO); mental, neurological, and substance use disorders make up 10% of the global burden of disease and 30%

of non-fatal disease burden (2). Additionally, mental disorders have highest average length of stay in hospital with 12.9 days in International Disease Codes-10 (ICD), after mental disorders, respiratory diseases have closest hospital stay days to this group with 5.6 in 2017 (4). The mental disorders have the average maximum staying days in hospital. Yet, globally, the median number of mental health workers is 9 per 100 000 population, and there is extreme variation from below 1 in low-income countries to 72 in high-income countries (5). So, the workforce capacity for this ICD group is important to carry out and sustain the health services to the individuals.

In the WHO global mental health report, a comprehensive action plan for mental disorders has been developed for the 2013-2020. According to this plan, there are four main objectives and six targets. The second objective is to provide comprehensive, integrated and sensitive mental health and social care services through community based practices. For this purpose; financial resources, workforce, physical capacity, stakeholder cooperation, accessibility and continuity of services, inpatient care and social support are seen as the main indicators (5). Based on, the social work professions have important role since the professional practise of social worker enable to reach these objectives.

In this aspect, the aim of this study is to compare and determine the position of Turkey and other European countries in a graphical plane, divide countries into subgroups and see similarities and differences relative to each other according to the mental health sector workforce indicators, determined by World Health Organization. And also, to discuss the role of social work profession in mental health sector. So, the current situation of mental health sector in terms of workforce can be interpreted. While the studies in mental health sector are examined, it is seen that the related literature is based on the causes, risk factors, treatment methods of diseases in the micro and the national and regional prevalence and incidence comparisons in the macro level. One of the most important requirements of this study is that the number of studies between countries is quite rare for mental health workforce. On the other hand, there are many studies that compare Turkey and other countries with respect to health expenditures, general health workforce, mortality and morbidity, infrastructure, women's health in literature, there is no comparative study of mental health workforce indicators in the perspective of psychiatric-clinic social work and it is another unique aspect of this study.

MATERIAL AND METHODS

Multi-dimensional Scaling (MDS) technique was used to compare multiple countries with more than one mental health workforce indicator rather than comparing countries on a single indicator or comparing two countries with more than one indicator.

MDS is a statistical method for revealing relationships between objects by using distances in cases where the relationships between objects are unknown, but distances can be calculated. (6). MDS is one of the interdependence techniques used when dealing with the existing interrelationship between all variables, where any or a group of variables is not dependent on one another and cannot be explained to another. It includes complex mathematical, geometric and statistical operations where models can be obtained visually revealing the structure of the data (7).

MDS is a method which aims to determine the positions of objects in a k-dimensional ($k < p$) space based on the distances determined according to the variable (p) and observations (n) or units and determines the relations between the objects. The general purpose of MDS is to present the objects as close to the original shape as possible using the distance values of the objects with as few dimensions as possible (8). In addition, there is no assumption about the distribution of data in the MDS and the graphical representation is obtained by converting the distance matrix to graph coordinates (9). The stress value, which is an expression of the difference between the real shape in multidimensional (p dimensional) and the predicted shape in reduced (k-dimensional) space, is calculated. Dimension analyzes that give close to zero stress are considered appropriate. According to this;

- Stress ≥ 0.20 bad
- $0.10 \leq \text{stress} < 0.20$ middle
- $0.05 \leq \text{stress} < 0.10$ good
- Stress < 0.05 very good
- $0 < \text{stress} < 0.025$ excellent

Finally, the coordinates of the units or objects at the appropriate dimension level are obtained. These coordinates are represented in space and the relations between each unit or object are interpreted (6).

We used four different mental health workforce data for 29 European regions. The data is for 2016 or the nearest year. We gathered the data from WHO Mental Health Database. The workforce health indicators for mental health sector are grouped under four headings by WHO (10). These are;

- *Social workers*, working in mental health sector, per 100.000: Social workers working in mental health (per 100.000 population), including professionals working in private and public mental health facilities as well as private practice
- *Psychologists*, working in mental health sector, per 100.000: Psychologists working in mental health (per 100.000 population), including professionals working in private and public mental health facilities as well as private practice.
- *Psychiatrists*, working in mental health sector, per 100.000: Psychiatrists working in mental health (per 100.000 population), including professionals working in private and public mental health facilities as well as private practice.
- *Nurses*, working in mental health sector, per 100.000: Nurses working in mental health (per 100.000 population), including professionals working in private and public mental health facilities as well as private practice

We performed MDS technique to compare 29 European Region countries which data be gathered by using four mental health sector workforce indicators. Also, we utilized SPSS 20.0 package program. The results are given in the following part.

RESULTS

In the Multidimensional Scaling (MDS) analysis using mental health sector labor indicators of 29 European countries; For $k=2$ (Kruskal) iteration was continued until the stress statistic was less than 0.001. Since we reached to 0.00081 in the eighth iteration, iteration was stopped. The result of the stress statistics is very close to 0. This is a desirable result for MDS. Stress value was calculated according to Kruskal's formula and was found as 0.9886. In this context, the stress value for $k=2$ dimensions reveals the data by 0.98. In this case, it can be said that the results obtained adequately reflect the data set we have. According to this; multidimensional scaling analysis was performed in two dimensions. Table 1 shows the coordinates of the countries according to the mental health sector workforce variables.

According to Table 1; In the first dimension, Belgium, Germany, the Netherlands, Norway, Sweden, Finland and France have both positive and over 1 values. Firstly, we can say that these countries are perceived similar according to mental health workforce. Since the values of these countries are higher than the other countries, in the first dimension, these countries are the most important separators. Countries whose values are

close to zero are those which are perceived as similar in the first dimension and are not important in this dimension. In the second dimension; Turkey is the country which are separated by positive values above 1. Therefore, in the second dimension, Turkey is in the parser position. This situation shows that Turkey is different from the other 28 countries in terms of the mental health sector workforce indicators.

Table 1. Table of coordinates

VAR1	Belgium	1.7516	1.1966
VAR2	Bosnia and Herzegovina	-.7832	-.0515
VAR3	Czechia	-.5139	-.0305
VAR4	Germany	1.2256	.0967
VAR5	Italy	-.6818	.0481
VAR6	Netherlands	3.1731	-.8966
VAR7	Republic of Moldova	-.9607	.0095
VAR8	Russian Federation	-.4672	.1533
VAR9	Spain	-.7664	-.3645
VAR10	Albania	-1.1347	-.0531
VAR11	Armenia	-1.0302	-.0998
VAR12	Azerbaijan	-1.0553	-.1535
VAR13	Belarus	-.5843	-.2486
VAR14	Bulgaria	-.8157	-.0120
VAR15	Croatia	-.4732	.0964
VAR16	Estonia	-.5129	-.2958
VAR17	Greece	-.6715	-.0904
VAR18	Hungary	-.4730	.0967
VAR19	Norway	4.1090	.1465
VAR20	Poland	.1139	-.6108
VAR21	Romania	-.8410	-.0172
VAR22	Slovenia	-.4110	.0489
VAR23	Sweden	1.2540	.0739
VAR24	Turkey	-.0226	1.9964
VAR25	Montenegro	-.6783	-.0214
VAR26	Finland	1.4055	-1.5970
VAR27	France	1.1181	-.1635
VAR28	Serbia	-.7737	-.2064
VAR29	Republic of North Macedonia	-.5000	-.0504

Then, we created differences matrix in order to determine which countries are closest to each other and which countries are farthest away from each other. Since it is not possible to show all 29 countries in a single table, some of them are shown in Table 2 but we explained important results in the text.

Table 2. Differences matrix

	1	2	3	4	5	6	7	8	9	10
1	,000									
2	2,795	,000								
3	2,493	,261	,000							
4	1,307	1,974	1,874	,000						
5	2,676	,197	,351	1,874	,000					
6	2,493	4,009	3,837	2,180	3,979	,000				
7	2,873	,197	,451	2,180	,231	4,232	,000			
8	2,390	,351	,292	1,694	,292	3,837	,451	,000		
9	2,890	,292	,366	1,974	,366	4,009	,351	,615	,000	
10	3,065	,366	,624	2,193	,351	4,390	,197	,624	,451	,000

Countries with values close to 0 according to the differences matrix are similar, whereas countries with values above 1 are different in terms of mental health workforce in the matrix. According to the results, Turkey has the values above 1 with all the other 28 countries. According to the matrix results for 29 European countries, Turkey is the similar to Russia, Croatia, Hungary and Slovenia mostly. On the other hand, Turkey is the most different, respectively, from Norway, the Netherlands, Germany and Spain. For all differences matrix scores, the most similar countries are Bulgaria and Romania, Bulgaria and Bosnia Herzegovina, Bulgaria and Montenegro, Montenegro and Bosnia Herzegovina, Albania and Azerbaijan.

After the coordinate table and the difference matrix, we obtained graphical representation arranged according to the coordinates in two-dimensional space. Since the data we used in the analysis are measured at

intermittent or proportional measurement level, we performed euclidean distance measurement and the results are shown in Figure 1.

According to the Euclidean distance model in Figure 1, we see that the countries are located close to each other when they are similar. Turkey (VAR24) was located somewhere away from the general trend in the euclidean distance model. while the general trend away from the country except Turkey, Belgium, Germany, the Netherlands, Norway, Sweden, Finland and France appear to be. Turkey has both these countries away from the group and located in a remote spot in the overall trend. Except Turkey, Belgium, Germany, the Netherlands, Norway, Sweden, Finland and France located away from the general. We found that Turkey is away from both this group and general trend for 29 European countries.

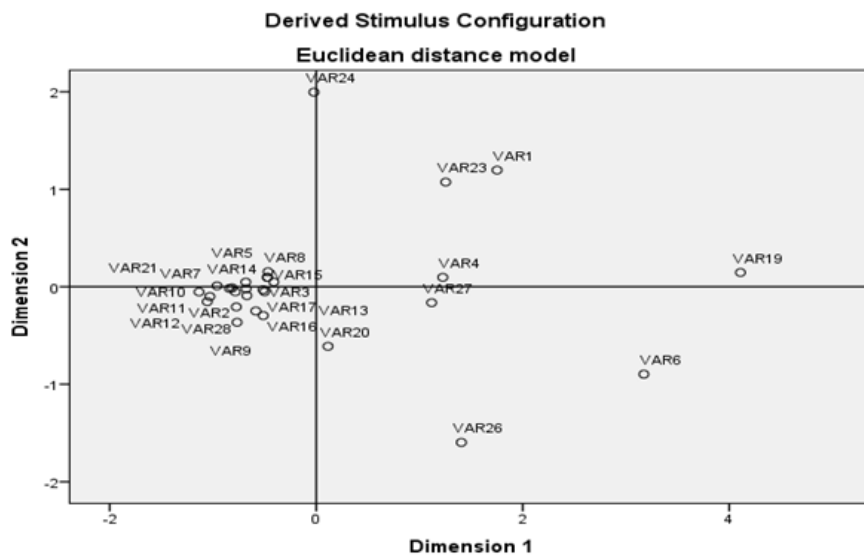


Figure 1. Euclidean distance model

DISCUSSION

On globally, there are some inequalities and differences on mental health sector availability, financial resources, workforce both between countries and within countries. For instance, in terms of workforce, rates are estimated to vary from below 2 per 100.000 population in low-income countries to over 70 in high-income countries. The global median remains at 9 per 100.000 population, or less than one mental health worker per 10.000 population. While the number of psychiatrists per 100.000 people in Norway 48.04, this number drops to 1.64 in Turkey. In similar tendency, while the number of social workers per 100.000 people in Sweden is 18.42, this number drops to 1.64 in Turkey. Within Turkey, the number of mental health sector workforce vary from 1.64 to 150.25 per 100.000. The number of nurses working in the mental health sector in Turkey was 150.25 per 100.000 per population but the number of social workers working in the mental health sector was 1.64 per 100.000 per population in 2017. We discuss this variation on the base of Turkey's education policy. In the mental health sector focus, in nursing education in high schools and universities in Turkey is given extensively for many years and therefore it has many professionals in the field. Also in Turkey, social work education has been given by only a single university for many years. The social work departments in universities has become widespread since the 2000s and beyond. For this reason, the social work profession, which is already defined in the young occupations group, has recently started to specialize in areas such as mental health and therefore it is thought that social workers working in the field of mental health are relatively less. On this basis, we can say that, in Turkey, located in the developing country groups, the need in mental health sector for social work, psychiatry and psychology professionals is still high when compared with other developed countries such as Norway, Sweden etc.

On the other hand, there are large inequalities for outpatient services, child and adolescent services and social support on mental health. Globally, the median number of children and adolescents beds is less than 1 in the 100.000 population and is below 0.2 in low and low middle income countries and over 1.5 in high income countries (5). Although international data exist, according to Fisher et al., the number of international comparisons studies on mental health is very limited. So, they developed mental health-care quality indicators aims measures that will allow for international comparisons of mental health. One

of the indicators in this study was mental health workforce (11). In this study, we aimed to investigate the mental health sector workforce in comparative and multidimensional perspective. We found that Belgium, Germany, the Netherlands, Norway, Sweden, Finland and France are differ from other European countries. Although Turkey is in the Europe (EUR) region, according to the analysis of mental health workforce indicators, it was not found to be similar to the countries in the European region. Although there is not much comparative study on mental health workforce in the literature, there are comparative analyzes between countries and within countries in terms of different health indicators. Ersöz in 2008 found that, Turkey is similar to Korea Republic, Mexico and Poland in terms of health indicators (12). In another study, Rehimli and colleagues found that Turkey is differs from other European countries and they suggest to increase in health investment and use it effectively and efficiently to improvements in female health indicators (13). In this study we found that Turkey is the similar to Russia, Croatia, Hungary and Slovenia mostly and is the most different, respectively, from Norway, the Netherlands, Germany and Spain in terms of mental health sector workforce.

Ruble and colleagues presents a systematic review of grey literature describing current initiatives that assess the quality of mental health care in 12 countries. In their study they investigated Australia, Canada, England, Germany, Ireland, Japan, the Netherlands, New Zealand, Norway, Scotland, Taiwan, and United States in terms of review of quality performance measurement initiatives at the national and found that despite increased activity in recent years in the development of mental health indicators, major challenges remain owing to the lack of coordination and oversight of the various initiatives and programs, the lack of clear responsibility for promotion of best practices, and limitations in the ability to capture more clinically textured data beyond insurance claims (14).

In the literature, several studies, examining the availability of health care, have used state-level data on suicide rates in different regions, as well as the density of health care providers, such as general practitioners, social workers, psychiatrists and psychologists. These studies have yielded some evidence that density of mental health providers is associated with lower suicide rates (15). For instance, Tondo and colleagues found that both the density of psychiatrists and density of non-psychiatrist physicians are associated with lower suicide rates (16). In our study, we did not examine

the relationship between mental health workforce and suicide but the countries which has similar suicide level such as Finland, Norway and Sweden are similar in terms of mental health workforce as well. Compared to the countries we examined in our study, although Sweden, Norway has a relatively high number of mental health workers, it is seen that suicide rate ranks is relatively higher contrary to expectations (2).

CONCLUSION

Despite the limited sources and inequalities, the burden of mental disorders is high in populations on globally (17). Today, one in four people in the world is affected by mental or neurological disorders at some point in their lives. Around 450 million people currently suffer from such conditions, placing mental disorders among the leading causes of ill-health and disability worldwide (2). For mental disorders, treatments are available, but nearly two-thirds of people with a known mental disorder never seek help from a health professional. Stigma, discrimination and neglect prevent care and treatment from reaching people with mental disorders, says the World Health Organization (18). For these and more reasons, the WHO has been preparing Mental Health Atlas Report since 2001. This report require a focus on investment in leadership and governance for mental health, and the development of integrated, responsive mental health and social care services in community-based settings. Strategies for promotion and prevention in mental health, and building and strengthening of information systems, evidence, and research for mental health in conflict-affected countries, are also needed. Mental health sector workforce has crucial role in these requirements.

When social work professions compared with psychiatry and psychology in mental health sector, psychiatry and psychology have individual-oriented intervention in professional practice. But, the social work profession has a political role both in the clinical focus and in activating the individual's social support systems. In this respect, the multi-faceted approach of the social work profession in the mental health sector and its comprehensive intervention in micro-mezzo-macro dimensions are important. In order to reach comprehensive, integrated and sensitive mental health and social care services through community based practices objectives, social workers have major role. To ensure specialization in this field, the number of clinical social work education programs, which are extremely limited, should increase in Turkey.

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