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ORIGINAL ARTICLE

Prevalence of Digital Technology Use in Psychiatry Patients

Psikiyatri Hastalarında Dijital Teknoloji Kullanımının Yaygınlığı

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ABSTRACT

Objective: Digital technologies help to monitor patients remotely, collect medical data, recognize the disease and increase awareness through psychoeducation and self-help applications. However, literature on the utilization of digital technologies among psychiatric patients is scarce. The aim of this study was to investigate the prevalence of the use of digital technology in patients applying to psychiatry outpatient clinic and its distribution according to diagnoses.
Material and Methods: Between September-November 2023, 500 patients who applied to the Selcuk University Faculty of Medicine Psychiatry Outpatient Clinic and volunteered to participate were included in the study. After the psychiatric interviews were completed, a questionnaire was filled out asking about the characteristics of the use of mobile technologies, internet, social media and health applications.
Results: Of the study group, 69.4% were female (n=347) and the mean age was 33.9 (±13.01) years. The educational status of 50.4% of the participants was university or master's degree. While 96% of the participants used smartphones, 16% used wearable technology (n=80). Internet usage rate was 94.8% and social media usage rate was 91%. When 251 people who did not use any health application but would like to use one were asked which features they would like to have in the application they would like to use, 78.8% stated that they would like to create an appointment, 67.7% would like an appointment time reminder, 59.7% would like drug side effect query, 55.7% would like their physician to have access to their health information, and 54.9% would like online psychotherapy.
Conclusion: The prevalence of smartphone and internet use among patients admitted to psychiatry is similar to the national population. There is an unmet need in terms of health applications for the psychiatric patient group. Considering the desired characteristics of health applications, it should be taken into account that there are different demands in psychiatric diagnosis groups.

Keywords: Smartphone, Digital technology, Psychiatry, Bipolar disorder, Schizophrenia

ÖZ

Amaç: Dijital teknolojiler; hastaların uzaktan takip edilmesini, tıbbi verilerin toplanmasını, psikoeğitim ve kendine yardım uygulamaları ile hastalığın tanınması ve farkındalığın artmasına yardım etmektedir. Literatürde psikiyatrik hasta popülasyonunda dijital teknolojilerin kullanımına yönelik bilgi kısıtlıdır. Bu çalışmanın amacı, psikiyatri polikliniğine başvuran hastalarda dijital teknoloji kullanımının yaygınlığını ve tanılara göre dağılımını araştırmaktır.
Yöntem: Eylül-Kasım 2023 tarihleri arasında Selçuk Üniversitesi Tıp Fakültesi Psikiyatri Polikliniğine başvuran ve katılmaya gönüllü 500 hasta dahil edildi. Hastalara psikiyatrik görüşmelerinin tamamlanmasının ardından mobil teknolojiler, internet, sosyal medya, sağlık uygulamaları kullanım özelliklerinin sorulduğu bir anket doldurulduldu.
Bulgular: Çalışma grubunun %69,4'ü kadın (n=347) ve yaş ortalaması 33,9 (±13,01) idi. Katılımcıların %50,4'ünün eğitim durumu üniversite veya yüksek lisans idi. Katılımcıların %96'sı akıllı telefon kullanmaktayken %16'sı giyilebilir teknoloji (n=80) kullanmaktaydı. İnternet kullanım oranı %94,8 sosyal medya kullanım oranı %91 idi. Herhangi bir sağlık uygulaması kullanmayan ancak kullanmak isteyen 251 kişiye kullanmak istedikleri uygulamada hangi özelliklerin olmasını istedikleri sorulduğunda %78,8'i randevu oluşturmak, %67,7'si randevu saati hatırlatıcısı, %59,7'si ilaç yan etki sorgulaması, %55,7'si hekiminin kendi sağlık bilgilerine erişebilmesi, %54,9'u çevrimiçi psikoterapi özelliklerinin olmasını istediğini belirtti.
Sonuç: Psikiyatriye başvuran hastalar arasında akıllı telefon ve internet kullanım yaygınlığı ülke popülasyonuyla benzerlik göstermektedir. Psikiyatrik hasta grubu için sağlık uygulamaları açısından karşılanmamış bir ihtiyaç söz konusudur. Sağlık uygulamalarında bulunması istenen özelliklere bakıldığında psikiyatrik tanı gruplarında farklı taleplerin olduğu dikkate alınmalıdır.

Anahtar kelimeler: akıllı telefon, dijital teknoloji, psikiyatri, bipolar bozukluk, şizofreni

Introduction

Today, with the rapid development of digital technologies and their accessibility by the society, the use of digital products such as smartphones, computers and tablets that can access the internet has become widespread worldwide. With the widespread use of wearable technologies that can provide measurements such as heart rate, blood pressure, sleep cycle, digital technologies and digital health applications are manifested everywhere in the field of health, including psychiatry (1). The remote continuation of healthcare services during the Coronavirus Disease 2019 (COVID-19) pandemic has increased interest in this field. As a matter of fact, the budget allocated to digital health technologies in the United States of America (USA) was almost doubled in 2020 compared to 2019, and exceeded 14.7 billion dollars in the first half of 2021 (2). There are more than 350,000 health apps available for mobile use on digital platforms. More than 10,000 of these are specific applications related to mental health (2) and their number is increasing rapidly in response to the ever-increasing demand (3). E-Nabız is a public, digital

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health application supported by the Ministry of Health of the Republic of Türkiye. It is an application where health information produced on behalf of the person can be managed and medical information can be accessed from a single place, regardless of where the examination, tests and treatments are performed. All this emphasizes the growing demand in this field and the importance of the subject.

The lack of objective measurement in psychiatry causes many difficulties. Clinical follow-ups for diagnosis and routine follow-ups usually consist of cross-sectional symptom assessments based on self-reports, which have various limitations due to recall difficulties, bias and misinterpretation (4). There is an inability to monitor changes in mood, cognition and behavior. Therefore, more effective strategies for the clinical management of diseases are required. Advances in digital technologies may offer potential solutions to the above challenges (5).

Today, digital technologies are used in psychiatry for various purposes such as follow-up, treatment and monitoring (5). The widespread use of smartphones, many sensors on them, and the fact that people carry them every day and for most of the day make these devices ideal for digital healthcare and digital phenotyping (6). Many mobile applications specific to the diagnoses of depressive disorder (DD), anxiety disorder (AD), bipolar disorder (BD), psychotic disorder (PD), insomnia disorder, eating disorders and substance use disorders have been launched (7). Through these applications, it is aimed that patients can receive information about their diseases, remind appointments and medication, and receive the necessary therapeutic support from mental health professionals by providing remote access if necessary (8). Studies have also shown that personal data obtained from smartphones and wearable technologies can be used effectively in the early diagnosis of mental illnesses before exacerbations and in the follow-up process (9,10). In recent years, the increasing knowledge in this field suggests that digital phenotyping can be done by analyzing the behavioral patterns of the person and other data obtained, and that the perspective in the field of psychiatry can be further expanded thanks to digital phenotyping (11).

Determining the prevalence of individuals' technology use plays an important role in the process of transition to utilizing digital applications. Determining the frequency of digital use and willingness to use applications is the first step to identify unmet needs. Looking at the statistics on digitalization, it has been reported that 86.11% of the world population owns a smartphone and 65.7% use the internet (12,13). In our country, according to August 2023 Turkish Statistical Institute (TURKSTAT) data, 95.5% of the country's population owns a smartphone while 87.1% reported using the internet (14).

Studies conducted in different countries on smartphone and internet use by psychiatric patients indicate that the rates are close to the world population rates (15). In a study conducted in patients with chronic psychiatric illness, it was reported that the rate of smartphone use was 60% (16). In a study of inpatients in the USA, the rate of health-related app use was reported as 25% and 60% of participants reported a desire to use a health app (15). To the best of our knowledge, there is only one study in Türkiye investigating the prevalence of the use of digital technologies among psychiatric patients (17). In this study, which included 300 participants admitted to outpatient psychiatry outpatient clinics in 2021, 91.4% of the participants used smartphones and 93.3% had internet access (17). At the same time, the rate of using any health application was 35%, and the rate of those who conducted research on disease and health-related issues over the phone was 79% (17). However, no data was provided by diagnostic groups.

Our aims in this study are as follows; to determine the level of using smartphone, wearable technology, internet, social media and health application, to evaluate the desire to use a health application and the level of expectation from the application, to compare the data according to diagnostic groups in outpatients admitted to psychiatry outpatient clinic.

Material and Methods

Patients between the ages of 18-65 years with any psychiatric diagnosis, who were currently receiving treatment and only clinically in remission were included in this study. Patients under the influence of alcohol and drugs, mental retardation, autism spectrum disorder and chronic neurological comorbid disease (such as dementia, previous cerebrovascular accident, epilepsy) were excluded.

Between September and November 2023, 760 patients who applied to the Psychiatry outpatient clinic of Selcuk University Medical Faculty Hospital (XUTF) were invited to the study. Two hundred people who did not meet the inclusion criteria or refused to participate in the study were excluded from the study. Also, 60 people were not included in the analysis due to missing data. The final 500 participants who agreed to participate in the study were administered a data collection form including sociodemographic and clinical characteristics, use of social media and related technologies and their opinions on their use by their physicians before their routine outpatient examinations.

Statistical Analysis

In the evaluation of the data, mean and standard deviation were used for continuous variables and frequency tables were used for qualitative data. Chi-square test was used to investigate the relationship between qualitative data. Differences between continuous variables, t-test and their nonparametric equivalents were used. Statistical analyses were performed with SPSS 23 package program. Statistical significance was set at $p \leq 0.05$.

Results

In our study, 69.4% of the participants were female (n=347) and the mean age was 33.9 (±13.01) years. Half of the participants had university or master's

Table 1. Sociodemographic Data of Patients

Age (years)	Mean, SD	33.9. ±13.01
Gender/Female	N%	347. 69.4%
Education Status		
Illiterate/primary education	N%	131. 26.2%
High school	N%	117. 23.4%
University / Master's Degree	N%	252. 50.4%
Employment status		
Not working/Unemployed	N%	204. 40.8%
Working	N%	157. 31.4%
Retired	N%	28. 5.6%
Housewife	N%	111. 22.2%
Diagnosis Distribution		
Anxiety Disorders	N%	197. 39.4%
Depressive Disorders	N%	147. 29.4%
Bipolar Disorders	N%	46. 2.9%
Trauma Related Disorders	N%	23. 4.6%
Neurodevelopmental Disorders	N%	19. 3.8%
Psychotic Disorders	N%	16. 3.2%
Obsessive-Compulsive Disorders	N%	15. 3%
Others	N%	37. 7.4%
Smartphone Usage / Yes	N%	480. 96%
Use of Wearable Technology / Yes	N%	80, 16%
Internet Usage / Yes	N%	474, 94.8%
Social Media Use / Yes	N%	455. 91%
E- Nabız Use / Yes	N%	396. 79.2%
Use of health applications other than E-Nabız/ Yes	N%	93. 18.6%
If not using:Would he/she like to use a health app? / Yes	N%	251. 61.7%

Table 2. Distribution of Sociodemographic Data According to Diagnoses

	Age (years)	Gender (Female)	Employment Status (Employed / Retired / Housewife)	Education Duration (years)	Comorbidity	Smoking	Alcohol Use	Substance Use
AD	35.72 (±14.0)	71.6% (n=141)	27.4% (n=56) / 5.1% (n=10) / 27.4 %(n=54)	11.3 (±5.0)	35% (n=69)	29.4 % (n=58)	8.6% (n=17)	4.1% (n=8)
DD	32.37 (±12.2)	75.5% (n=111)	34% (n=50) / 4.8% (n=7) / 20.4 %(n=30)	11.6 (±4.0)	29.9% (n=44)	29.9% (n=44)	8.8% (n=13)	3.4% (n=5)
BD	37.67 (±12.7)	60.9% (n=28)	39.1% (n=18) / 10.9 % (n=5) /17.4 %(n=8)	12.3 (±5.3)	39.1% (n=18)	34.8 % (n=16)	15.2% (n=7)	0% (n=0)
TRD	30.00 (±15.8)	65.2% (n=15)	30.4% (n=7) / 13% (n=3) / %17.4 (n=4)	10.7 (±4.4)	30.4% (n=7)	30.4% (n=7)	13% (n=3)	4.3% (n=1)
ND	22.00 (±4.7)	68.4% (n=13)	52.6%(n=10) / 0% (n=0) / 0% (n=0)	15.3 (±1.8)	5.3% (n=1)	15.8% (n=3)	15.8% (n=3)	5.3% (n=1)
PD	35.50 (±11.0)	31.3% (n=5)	25% (n=4) / 6.3 % (n=1) / 6.3 % (n=1)	10.9 (±4.9)	12.5% (n=2)	31.3 % (n=5)	0% (n=0)	0% (n=0)
OCD	23.00 (±6.6)	73.3% (n=11)	13.3% (n=2) / 0%(n=0) / 13.3% (n=2)	13.6 (±3.8)	13.3% (n=2)	6.7% (n=1)	6.7% (n=1)	0% (n=0)
Others	33.81 (±10.3)	62.2% (n=23)	27%(n=10) / 5.4% (n=2) / 32.4% (n=12)	10.7 (±5.3)	37.8% (n=14)	37.8 % (n=14)	21.6% (n=8)	10.9% (n=4)

AD: Anxiety Disorders; DD: Depression Disorders; BD: Bipolar Disorders; TRD: Trauma Related Disorders; NDD: Neurodevelopmental Disorders; PD: Psychotic Disorders; OCD: Obsessive-Compulsive Disorders

Table 3. Distribution of Data on Technology Use According to Diagnoses

	Smartphone Usage	Wearable Technology Usage	Internet Usage	Social Media Usage	E-Nabız Usage	Health Application Usage Other than E-Nabız	If not using: Would like to use a health application / Yes
AD	97.5% (n=192)	15.2 % (n=30)	94.4 % (n=186)	91.9% (n=181)	80.2% (n=158)	21.3% (n=42)	58.7 % (n=91)
DD	94.6% (n=139)	17 % (n=25)	95.9% (n=141)	93.9% (n=138)	77.6% (n=114)	16.3% (n=24)	64.2% (n=79)
BD	93.5% (n=43)	10.9 % (n=5)	89.1% (n=41)	78.3% (n=36)	80.4% (n=37)	19.6% (n=9)	75.7% (n=28)
TRD	100% (n=23)	8.7% (n=2)	100% (n=23)	100% (n=23)	78.3% (n=18)	21.7% (n=5)	38.9% (n=7)
NRD	100% (n=19)	26.3% (n=5)	100% (n=19)	89.5% (n=17)	94.7% (n=18)	31.6% (n=6)	69.2% (n=9)
PD	93.8 % (n=15)	6.3% (n=1)	93.8% (n=15)	87.5% (n=14)	68.8% (n=11)	0% (n=0)	56.3% (n=9)
OCD	100% (n=15)	13.3% (n=2)	100% (n=15)	93.3% (n=14)	80% (n=12)	20% (n=3)	66.7% (n=8)
Others	91.9% (n=34)	27% (n=10)	89.2% (n=33)	86.5% (n=32)	75.7% (n=28)	10.8% (n=4)	60.6% (n=20)

AD: Anxiety Disorders; DD: Depression Disorders; BD: Bipolar Disorders; TRD: Trauma Related Disorders; NDD: Neurodevelopmental Disorders; PD: Psychotic Disorders; OCD: Obsessive-Compulsive Disorders

degree (50.4%, n=252) and 40.8% (n=204) were not working/unemployed. The majority of the participants were AD and DD patients (39.4%, n=197; 29.4%, n=147). Sociodemographic data and diagnosis distributions are summarised in Table 1.

Almost all of the participants used smartphones (96%, n=480) and 16% (n=80) of them also used wearable technology (smartwatch, etc.). Internet and any social media programme usage rates were also quite high (94.8%, n=474; 91%, n=455). While 79.2% (n=396) of the participants were using e-Nabız, only 18.6% (n=93) were using a health application other than e-Nabız. When 81.4% (n=407) who did not use a health application were asked whether they would like to use a health application, 61.7% (n=251) stated that they would like to use one (Table 1). When the e-Nabız users were asked for which purposes they used e-Nabız; 73% (n=289) stated that they used it to control tests and examinations, 48.2% (n=191) stated that they used it to make an appointment at the haspital.

Sociodemographic data according to diagnoses are presented in Table 2. Data on smartphone use, wearable technology use, internet use, social media use, use of e-Nabız application, use of a health application other than e-Nabız, and whether those who do not use a health application would like to use a health application according to diagnoses are presented in Table 3.

When 251 people who did not use any health application but would like to use one were asked which features they would like to have in the application, 78.8% (n=198) responded that they would like to use it to make an appointment, 67.7% (n=170) to be reminded of appointment times, 59.7% (n=150) to question drug side effect, 55.7% (n=140) to access to his/her own health information by his/her doctor and 54.9% (n=138) stated that they would like to have online psychotherapy features.

When 37 BD and PD patients who did not use any health application but would like to use it were asked about the features they would like to have in the health application; 75.6% (n=28) responded that they would like to use it to make an appointment, 64.8% (n=24) to question drug side effect (n=24), 62.1% (n=23) for mood tracking, and 62.1% (n=23) stated that they would like to have online meeting features with their doctor.

When those who would like to have online psychotherapy feature in the health application were categorised according to diagnostic groups, 71.4% (n=11) were trauma-related disorders, 62.0% (n=49) depressive disorders and 56.0% (n=51) were anxiety disorders.

Discussion

With the increase in digital technologies and the use of artificial intelligence in most areas of life, there are opinions that digital psychiatry applications will be used more frequently in psychiatric practices, especially in clinical practice such as diagnosis, treatment and follow-up. However, in order for these and similar technological developments to be used widely, the existing conditions should be open and ready for this development. The most important of these is to determine the interest of patients receiving psychiatry services towards digital technology, the reasons for using technology and their prevalence.

In this study, in which we sought answers to these questions, 96% of the participants used smartphones and 16% used wearable technology. The smartphone usage rates of our study group were above the world average (86.11%) (12, 13) and close to the Turkish average (95.5%) announced by TURKSTAT in August 2023 (14). In our study, internet usage rate was 94.8% and social media usage rate was 91%. Internet usage rate was significantly above the world average (65.7%) and above the average in Türkiye (87.1%). In the literature, data on the prevalence of technology use according to psychiatric diagnosis distribution are limited. In a study conducted in 2021 on 300 outpatients admitted to the psychiatry clinic at Akdeniz University, the rate of smartphone use was 91.4% and internet access was 93.3%, similar to our findings in our study (17). One of the reasons for the higher rates of smartphone and internet use in the psychiatric patient population compared to the general population may be that smartphone addiction, which is considered one of the behavioural addictions, frequently accompanies psychiatric diagnoses (18-20). It may also be due to the fact that patients with chronic psychiatric illness have lower social functionality and meet their needs in this area through online platforms (21). Finally, this may be related to the fact that the sample of our study consisted of a relatively young population (mean age 33.9 years (±13.01)) and was conducted with a limited sample. The rate of smartphone use is above 90% and the rate of internet use is above 89% in all diagnostic groups shows that the psychiatric patient population uses digital technologies at a similar level to the general population and that digital options can be used in the follow-up and treatment processes of these patients.

E-Nabız, which is widely used as a health application in our country, was also used at a high rate (79.2%) in our sample. The rate of participants using a health application other than E-Nabız is 18.6%. In a study conducted in 2019, e-Nabız usage rate in the general population was reported as 47.9% (22), while in 2022, according to Siemens Healthineers Turkiye's Health Literacy Research Report (23), this rate was reported as 86%. These rates show that the prevalence of the use of digital applications has increased over the years and that the psychiatric patient population has kept pace with digital developments. When the patients who did not use any health application (other than e-Nabız) but wanted to use it were analysed, it was observed that the rates were the highest in BD and PD patients (75.7%, 56.3%). The high rate of individuals with chronic psychiatric illnesses stating that they would like to use a health application indicates the existence of unmet needs in this area.

When the desired features of the application are analyzed, it is seen that appointment creation and

drug side effect query are the most demanded features while the demand for some features varies according to the diagnostic groups. While the online psychotherapy feature was more prominent in the diagnostic groups of TRD, DD, AD, the features of mood tracking and online consultation with the physician were more prominent in BD and PD patients. Individuals with chronic psychiatric illness have fewer hospital admissions, including primary health care services, primarily due to stigmatisation, and fewer physician admissions due to the frequently encountered complaint of reluctance reveals the importance of telepsychiatry practices in this patient group that requires regular follow-up and treatment (8). These findings indicate that psychiatric diagnostic groups and their needs should be taken into consideration in health practices developed for psychiatric patients.

Limitations

Our study has various limitations, the first limitation is that the study is a cross-sectional study. In today's world where the use of technology is increasing rapidly, the rates we have determined in our study will change day by day. Therefore, as time passes, the data presented in the study will lose its validity. The second limitation is that the majority of our sample consists of individuals with a university or master's degree, which may be a bias. The third limitation is that an objective measurement tool was not used. The fourth limitation is that a high proportion of the participants (69.4%) were women. Lastly, the number of participants diagnosed with TRD, NDD, PD and OCD was low. There is a need for further studies by scaling in larger sample groups.

Conclusion

The prevalence of smartphone and internet use among patients admitted to psychiatry is similar to the national population. There is an unmet need in terms of health practices for the psychiatric patient group. It should be taken into consideration that there are different demands according to psychiatric diagnosis groups for the features that health practices will contain.

Ethical Approval: This study was approved by the Selcuk University Faculty of Medicine Local Ethics Committee on 01.08.2023 with decision number 2023/385.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

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Authorship Contribution Statement

Conception: R.T., Design: R.T., Supervision: R.T., Materials: Ö.B., F.Ç., H.R.D., Data Collection and/or Processing: Ö.B., F.Ç., H.R.D., Analysis and/or Interpretation: R.T., Ö.B., Literature Review: R.T., Ö.B., Writer: R.T., Ö.B., Critical Review: R.T.

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