RESEARCH ARTICLE

MOBILE HEALTH APPLICATİON USAGE: ISTANBUL PROVINCE EXAMPLE

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ABSTRACT

Objective: Mobile health applications provide opportunities for individuals to monitortheir health and access their health information whenever and whereverthey want. The purpose of this study is to examine the frequency with which smartphone owners use health-related mobile applications.
Materials and Method: This study, which is a descriptive study, was carried out between December 2017 and January 2018 on 660 people who agreedto participate in the research in private hospitals that allow European-based work in Istanbulto participate in the study and outpatient services. A 31-item mobile application and a set of questions assessing sociodemographic characteristics were used to collect the data. The findings obtained in the study were subjected to appropriate descriptive statistical analyses transferred to the SPSS 25 computer program for Windows. For the significance level of the statistical tests, p <0.05 was accepted.
Findings: The health-related mobile app download rate was found to be low among mobile phone users. It was determined that the most common health practices used werethe step-by-step, fitness, and family physician practices, and the majority of the participants used them on a daily basis. The general reasons for not downloading mobile health applications were determined to be opting for applications related to interests, internet spending costs, and the collection of data.
Conclusion: Mobile health applications are becoming increasingly costly, and an increasing number of patients are receiving continuous acceleration, prolonged treatment methods, limited and inadequate human power, it may be a solution step in eliminating hardware and building deficiencies.

INTRODUCTION

The rapid development of technology has made smartphones a part of everyday life. People can access a significant amount of information through mobile technology. This information is found in mobile health applications,which lead to a search for a healthy lifestyle,are found via smartphones, and change health behavior. Healthcare professionals are increasingly using health practices among patients and the general public (Seethamraju, 2004), and practices can play a role in patient education, the self-management of illnesses, the remote monitoring of patients, and the collection of dietary data (Olsina & Rossi 2002). An increasing number of people caneasily accesssocial media using mobile phones and applications and usesocial media to obtain health-related information (Sarcona, Kovacs, Wright, & Williams, 2017).

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According to the definition of the World Health Organization, mobile health (m-health) is more openly defined as " a function that uses mobile communication technology and infrastructure that are becoming increasingly used to improve the effectiveness and function of the current health system, functions such as health dissemination, remote disease management, complementary and innovative health practices with beneficial contributions (Kay, Santos,& Takane, 2011). Health services are providedthrough mobile communication means. E-health services are offered or developed through the Internet and information and communication technologies and are a field of medicine that is created through the combination of public health and business. In broader terms, the field is not only a technical development, but also the use of information and communication technology to improve health services at local, regional, and global levels (Boogerd, Arts, Engelen, & van De Belt, 2015). Health behaviors are behaviors that individuals show to maintain and improve their health. Health behaviors are a key factor in determining and maintaining health. Many researchers in the literature have studied the concept of health behavior. Kasl and Cobb (1966) werethe first to define health behavior and defined it as health behavior (e.g.,

healthy nutrition), behavior seeking remedies(e.g., goingto the doctor), and behavior of doingwhat is requiredto feel good (e.g., takingmedication, resting) (Kasl & Cobb,1966). In recent years, the use of mobile applications for health, fitness, diet, and chronic illness follow-up has increased exponentially (Riley et al 2011). Between 2012 and 2017, it increased use of smart phones 10,202,298 people in Turkey has reached 77,882,845 people.The annual rate of increase for the 5-year period was 15%. In the same period, the internet user rate increased by 200% to 27,649,055 and 67,979,127 (TUİK.2017). The number of mobile applications is increasing daily;they also bring revenue,obtainingvery high profits. AppAnnie's recent report analyzing this growth shows this. In the third quarter of 2017, the total number of application downloads in theAppStore and Google Play app storewas 26 billion, and this was only new downloads, not including re-downloads and updates (shiftdelete.net 2018). The ability of smartphones to be portable provides access to health information and applications at any time, and the capabilities of smartphones (such as sensors) increase the diffusionof these applications. The rapid spread of smartphone applications, however, makes it increasingly difficult for users, health professionals, and researchers to easily identify and evaluate high-quality applications (Cummings, Borycki & Roehrer, 2013).

The prevalence of more popular choices in these applications does not represent application quality or provide meaningful information (Girardello & Michahelles, 2010). When reviewing the literature, it can be seen that the mobile applications are mainly studied in terms oftechnical aspects, but the content quality of the applications is not considered (Seethamraju, 2004). The Healthcare Information and Management Systems Society (Arellano et al.2012) to assess the availability of healthcare practices have published guidelines. The published HIMSS criteria includecriteria for efficiency, effectiveness, user satisfaction, and fit, but no criterion for grading the quality of information has beenprovided. It can be argued that the health information contained in mobile health applications and the failure to assess its appropriateness may jeopardize user health and safety (Lewis, & Wyatt, 2014). This study aimed to determine the current usage status of mobile health applications and information about reasons for using or not using mobile health applications. To improve the usability of mobile devices and health applications, it is necessary to be knowledgeable about the motivation factors that influence the adoption and use of health applications. However, there is not enough work in this regard. It is envisaged that this work will contribute to the literature for defining and increasing the awareness of the motivation factors for the adoption and use of health practices.

Materials and Method

This research is designedusinga descriptive scanning model. In the descriptive scanning model, an existing situation is described and analyzed with qualitative and/or quantitative data. The study examined the frequency with which smartphone owners use health-related mobile applications.

Place, Universe, and Sampling of the Study

This study was carried out between December 2017 and January 2018 on 660 persons who agreed to participate in the survey in private hospitals that allow the work in Europe to work in the European province and apply for outpatient services. The research sample represents individuals aged 20 years or older living in the provincial borders of Istanbul in 2017. The sample of the study is composed of 664 individuals calculated as a result of the power analysis performed on 11,703,093 people (TUİK.2017), whichconstitutesthe whole of the universe. According to the determined number of samples, each participant inthe hospitals was determined by a proportional selection method using a layered random sampling method (Sümbüloğlu & Sümbüloğlu, 2005). This number varied between 50 and 100 according to the size of the hospital.

Aggregation Tool and Analysis

The questionnaire were used to collect the data consisted of 31 questions covering the following areas that Krebs and Tunca (2015) used in their work:(1) Socio-demographic characteristics, (2) standard health questions (e.g., tobacco use, weight, height, medical diagnoses, physical activity, and eating) (3) history and reasons for the use/nonuse of health practices, (4) perceived effectiveness of health practices, and (5) reasons for stopping use(Krebs & Duncan, 2015). Because the Mobile Application items were not an example ofTurkish society, questions about the applications were developed and help from different academicswith expertise in questionnaire development wasobtained. The survey took participants an average of 9 minutes to complete. The findings obtained in the research were analyzed with appropriate statistical analysis transferred to the SPSS 25 computer program for Windows. Descriptive statistical methods (frequenciesand percentages) were used in the evaluation of descriptive information about the present situation. For the significance level of the statistical tests, $p < 0.05$ was accepted.

Ethical Direction

To apply the work, the hospital administrations were interviewed and information was given about the study. Written permission was obtained from the administrations of private hospitals. Individuals participating in the survey gavewritten and verbal approval to volunteer to participate in the survey and provided a business telephone number on the data form so that they could reach the researcher if requiredwhile filling in the form.

RESULTS

The findings from the study's data were evaluated in two parts:sociodemographic and health characteristics and the usage of mobile health applications. The demographic characteristics are evaluated in Table 1.Among the participants, 56.9% (n = 376) were female, 43.1% (n = 284) were male, 48.9% (n = 323) were un skilled worker sof 5 (n = 208) primary school, 20.9% of occupational status (n = 138), 35,300 of monthly income (n = 159) (N = 323) were found to be good, and 74.2% (n = 323) of the respondents were good (p <.05) when the characteristics of the subjects were evaluated as 168.55, n = 490) were in normal weight, 43.9% (290) did not exercise or participate in physical activity for 15 minutes on any day of the week, 50.3% (332) had moderately good health, 59.8% (n = 395) were non-smokers, and 469% (n = 469) had been diagnosed and treated. The characteristics of mobile application use are evaluated in Table 2; (n = 295), 49.1% (n = 324) of the participants were using Samsung mobile phones, 44.7% (n = 295) were receiving services from the Turkcell service provider, 62.1% (n = 250) and 28.2% (n = 186) of

Table 1. Socio-demographic and Health Characteristics (n = 660)

	SS	n	%
Gender	Woman	376	% 56,9
	Male	284	%43,1
Age	18-30 years old	322	%48,7
	31-40 years	158	%23,9
	41-50 years	135	%20,4
	51-60 years	34	%5,1
	61-70 years	8	%1,2
	71 years old	3	%0,4
Education status	Primary school	208	%31,5
	High school	20	%31,3
	Associate	47	%7,1
	License	183	%27,7
	Graduate	8	%1,2
	Doctorate	8	%1,2
Job	Title Officer (teacher, doctor, nurse, engineer, soldier)	97	%14,6
	Unpaid Officer	47	%7,1
	Skilled Worker	135	%20,4
	Unskilled Worker	138	%20,9
	Tradesman / Trader	58	%0,8
	Housewife	110	%16,6
	Othe	75	%11,3
Monthly income	1000 or less	40	%6,1
	1001-1500	79	%12
	1501-2000	139	%21
	2001-2500	89	%13,5
	2501-3000	77	%11,6
	3001-3500	77	%11,6
	3501 and over	159	%24,3
How do you assess your health condition?	Very bad	7	%1,1
	Bad	19	%2,9
	Middle	242	%36,7
	Good	323	%48,9
	Excellent	69	%10,5
How do you see yourself in weight?	Too weak	8	%1,2
	Weak	42	%6,4
	Normal	490	%74,2
	Overweight	112	%17,0
	Obese	8	%1,2
How many days of the week do you have 15 minutes of physical activity?	Never	290	%43,9
	1 day	88	%13,3
	2 days	82	%12,4
	3 or 4 days	114	%17,3
	5-7 Days	86	%13,1
How healthy is your diet?	Very bad	11	%1,7
	Bad	62	%9,4
	Middle	332	%50,3
	Good	204	%30,9
	Excellent	51	%7,7
Do you smoke?	Yes	265	%40,1
	No	395	%59,8
Is there a disease that is diagnosed or treated?	No Testimonial	469	%71,1
	Hypertension	34	%5,2
	High Cholesterol	20	%3
	Depression	15	%2.3
	Obesity	8	%1,2
	Diabetes	13	%2,3
	Cancer	25	%3,8
	Heart attack	12	%1,8
	Ulcer	11	%1,7
	Liver Disease	5	%0,8
	HIV / AIDS	0	%0
	Alcohol addiction Drug addiction	0	%0
	Other	63	%9,5
Length (cm)	120-195	Average 168.55	Standard deviation 8.9
Weight (kg)	41-110	Average 68.67	Standard deviation 12.6

indents downloaded only one application related to mobile health, 28.6% (n = 186) (n = 323) chose concerns about the use of their data as the reason for not downloading mobile health applications, 67.1% (n = 443) would not give any money to paid applications, 41.7% n = 275) used mobile applications less than once a month, 47% (n = 310) spentmore than 1–5 minutes in the day on mobile health applications, and 30.8% (n = 203) a little insecurity.

In addition, 33.8% (n = 223) steps were the first health care application ontheirphone, for 19.9% (n = 131), family physicians were in second place, and 16.8% (n = 11) were central hospital appointment systems, 32.1% had some insecurities about mobile health applications (n = 212), 31.4% (n = 207) stated that the use of mobile health applications 38.9% (n = 256) improved their health slightly, 76.1%

Table 2. Use of Mobile Health Applications

	Features for Mobile Application Usage	n	%
What kind of cell phone are you using?	iphone	153	% 23,1
	Samsung	324	% 49
	Casper	183	% 4,5
	Other	153	% 23,1
Are you receiving service from a service provider?	Vodafone	204	%30,9
	Turkcell	295	%44,7
	Turkish telecom	141	%21,4
	Other	20	%3,1
Have you downloaded a mobile health-related application from your mobile phone?	Yes	250	%37,9
	No	410	%62,1
How many mobile health-related applications did you use if you downloaded them?	Never downloaded	334	%50,6
	1 application usage	186	%28,2
	2 application usage	62	%9,4
	3 application usage	32	%4,8
	4 application use	20	%3
	5-9 application use	26	%4,1
For what purpose did you download mobile health applications?	To see how much exercise I have	189	%28,6
	To organize and monitor the eating arrangement	48	%7,3
	To lose weight	93	%14,1
	To practice and learn	121	%18,3
	To monitor values such as blood sugar or blood pressure	48	%7,3
	To follow the sleep pattern	51	%7,7
	To track my medical records and medications	53	%8
	Yoga for relaxing exercises like meditation	19	2,9
	To follow daily health complaints	28	4,2
	To quit smoking or smoking habits	31	4,7
	To communicate with a doctor or nurse	28	4,2
	To remind me to drink medicine (blood pressure medicine etc.)	26	3,9
	To access medical information about my complaints	29	4,4
	To spend time when I'm bored	68	10,3
If you have not downloaded mobile health care, what is the most important reason for this?	Health practices are not interested	7	%1,1
	Practices are expensive and expensive	19	%2,9
	I have no confidence in sharing my health data	242	%36,7
	I have concerns about using data they have	323	%48,9
	I do not need it because my health is good	69	%10,5
	Applications are very complex and difficult to use		
How much money did you pay people who have paid for mobile health related applications?	I would not give any money	443	%67,1
	I gave 5 TL monthly	130	%19,7
	I gave 5-10 TL monthly	45	%6,8
	I gave 10-20 TL per month	10	%1,5
	I gave 20-30 TL per month	11	%1,7
	I gave 30-50 TL per month	9	%1,4
	I gave 50-100 TL per month	9	%1,4
	I gave over 100 TL monthly	3	%,5
How often do you use mobile healthcare?	Less than once a month	275	%41,7
	Several times a month	173	%26,2
	Several times a week	105	%15,9
	Once a day	75	%11,4
	2 or more per day	32	%4,8
How much time do you spend on mobile health applications during the day?	1-5 Minutes	310	%47,0
	5-10 Minutes	209	%31,7
	10-20 Minutes	83	%12,6
	20-30 Minutes	29	%4,4
	More than 30 minutes	28	%4,3
How confident are you in recording your personal information to mobile healthcare applications?	I do not trust in any way	162	%24,5
	I have a little insecurity	203	%30,8
	Neither trust nor trust	169	%25,6
	I trust	105	%15,9
	Too much confidence	21	%3,2
Which mobile health application is currently installed on your phone?	My family doctor Kim	131	%19,9
	Personal Electronic Health Record	36	%5,5
	Nearest Hospital	64	%9,7
	Sentinel Pharmacy	108	%16,4
	e-pulse	81	%12,3
	MHRS (Central hospital appointment system)	111	%16,8
	Calorimeter (Calculation of sunflower calories)	52	%7,9
	CalorieCounter & DietTracker (Calorie count and diet)	17	%2,6

	ArmWorkoutsFree (Slimming)	23	%3,5
	LoseIt! (Weakening)	18	%2,7
	SımılarBabyJournal (Baby care)	4	%0,6
	PeriodTrackerLite (menstruation cycle)	32	%4,8
	RelaxMelodIes (Soothing music)	8	%1,2
	DaIly Ab Workout (Abdominal Muscle Coach)	14	%2,1
	Fitness class (Fitnes)	30	%4,5
	First aid	50	%7,6
	Step counter	223	%33,8
	Body building	36	%3,5
	Fitwell (Bodybuilding)	11	%1,8
	Pain Determiner (Foot pain determinator)	13	%2,0
	Moves	10	%1,5
	PushUpsFree (Training program)	13	%2
	(Weight, height, fat ratio, muscle ratio, bone, cholesterol ratio)	8	%1,2
	RelaxWıthTranzotice (Calming pictures and music)	8	%1,2
	Heart Rate Monitör (Heart rhythm)	7	%1,1
	New Pilates (Pilates application)	24	%3,6
	StressCheck (Stress level meter)	8	%1,2
	BMI Calculator (following body mass index)	5	%0,8
	Cigarettes Lite (cigarette consumption and losses)	15	%2,3
	Heart R8 (Heart rhythm application)	12	%1,8
	Medline (When this practice is used, doctors can keep patients' disease-related values under constant control)	4	%0,6
	EasyRecIPes (Regimen menus)	6	%0,9
How much you trust mobile health applications about the protection and privacy of your personal information?	I do not trust in any way	174	%26,4
	I have a little insecurity	212	%32,1
	Neither trust nor trust	169	%25,6
	I trust	91	%13,8
	Too much confidence	14	%2,1
How did you learn about the use of mobile healthcare applications?	From the app download store	207	%31,4
	Friends and family	199	%30,2
	From internet browsing	94	%14,2
	Television and newspapers	72	%10,9
	Doctors, nurses or other health workers	88	%13,3
How do you think your mobile health practices have improved your health?	Never improve my health	82	%12,4
	Does not improve my health	88	%13,3
	What does not improve what does not improve	193	%29,2
	It will improve a little	256	%38,8
	It develops very much	41	%6,3
Do you have a health practice that you downloaded and did not use anymore?	Yeah	158	%23,9
	No	502	%76,1
Why do not you use the mobile health app when you download it?	It takes a lot of time to enter the information	96	%14,5
	I lost interest	141	%21,4
	There were hidden costs (Internet quotes etc.)	42	%6,4
	Too confusing to use	63	%9,5
	I have felt that mobile health applications are addictive to my friends and family members	27	%4,1
	He did not help me like I wanted	49	%7,4
	I found a better app	28	%4,7
	I reach goals that I do not need to use for a long time	17	%2,6
	I do not work on my phone anymore	11	%1,7
How much interest does it take to get a doctor's appointment through an application?	Very uninteresting	96	%14,5
	Not interested	104	%15,8
	What does not matter	112	%17,0
	Attracts attention	274	%41,5
	It gets very interesting	74	%11,2
How much interest do you use health practices to look at your medical records?	Very uninteresting	84	%12,7
	Not interested	132	%20,0
	What does not matter	135	%20,5
	Attracts attention	238	%36,1
	It gets very interesting	71	%10,8
Is it recommended to use mobile health practice by a health worker?	Yeah	143	%21,6
	No	517	%78,4

(n = 502) downloaded such apps butdidnot engage in any health practices, 23.9% (n = 158) stated that they no longer use them because 21.4% (141) lost interest in them, and 78.4% (n = 517) were not advised by a health care practitioner.

DISCUSSION AND CONCLUSION

As smartphones and tablets become part of everyday life, mobile apps have increased interest in many areas of the field.

Some of these areas are mobile health applications that individuals can use to monitor their health in their daily lives. Mobile health applications provide opportunities for individuals to monitortheir health and access their health information whenever and whereverthey want. However, there is insufficient evidence in the literature about the extent to which individuals, making it possible for individuals to track their health, use these practices. This study examined the frequency with which smartphone owners use health-related

mobile applications. Mobile healthcare applications may be an alternative solution to overcomehealthcare delivery barriers, which include many factors, such as increased health costs and patient numbers, prolonged treatment processes and methods, inadequate human strength,alimited ability to conductbusiness, hardware failure, and building deficiencies. With these applications, access to health can be accelerated and the health system's effectiveness and function can be improved. However, for mobile health applications to contribute to the healthcare system, smartphone users depend on the ability to identify and access technologies remotely for mobile healthcare applications. In the literature, there are insufficient national studies on whether smartphone users are aware of these applications and theirlevel of usage. For this reason, this study provides a new and meaningful contribution to the literature on the development of health-related mobile applications. When the study results were examined, it was determined that more than half of the participants did not download the mobile health phone application, and the subscribers were required to monitortheir level of exercise and to download the most applications. According tothe literature, exercise, nutrition, weight management, and blood pressure applications are popular among consumers in terms of the most common reasons for engaging in health care (Krebs & Duncan, 2015; Fox & Purcell, 2010).). The findings support these studies.

It was determined that more than half of the participants were not worried about the use of their personal data because they did not lower their level of mobile health practices and that they were willing to pay money to practice them. Participants' avoidance of costsmay be due to the perception that mobile phone use and applications are primarily related to communication and entertainment. The participants learned about the use of mobile healthcare applications from the practice download store, that mobile healthcare practices seem to have improved their health slightly, and that a health worker is not advised to use mobile healthcare. In addition, when the demographic information of participants was examined, it was found that most of the participants were female and the primary education was in education, whereas those with the status of unskilled workers were predominant and theirmonthly income was above average. According to a survey conducted by Pew (2012) on mobile health applications, 19% stated that they use at least one health care application and that their likelihood of engaging in a high level of health care is higher (Fox & Purcell, 2010;Comstock J-Mobil Health News,2015). The results of our work also supportthis work. The recommendationsof health care providers may be effective in encouraging the adoption of health practices,but our results show that health care providers do not currently recommend the use of health care practices. Clinical research suggests that service providers need to make recommendations to make patients feel comfortable (Bender, et al., 2013; Dolan 2014).

It was also determined that participants in the study preferred the applications of the Samsung and IPhone smartphone brands, which concentrated on activities and weight loss applications. One of the reasons for choosing these brands is that there are more mobile appsin the health andfitness area than those in the medical field, whichmay be due to thembeing free. It is very important for individuals to improve their health by monitoringtheir illnesses. It is stated in the literature that smartphones and mobile applications can contribute to behavioral change in every stage of lifeto improve health. In this context, health applications for health problems related to

the lifestyle, diet, exercise, smoking,and alcohol use of individuals, applications for chronic problems, and free reliable mobile technologies and applications (Krohn & Metcalf, 2014) can be employedto track and perform tasks, such as viewing related applications and drug information, synchronizing all these transactions with electronic health records, and automatically recording daily health status data. Considering the findings, mobile health applications offer many opportunities. Determinants of health policy in Turkey have also developed several mobile health applications to assess and offer such opportunities even if the awareness and availability of these applicationsis not raised. Researchers in this field have to work harder. As a result of this study, our proposals include health policy determinants in mobile health applications in five-year development plans and 2023 targets and addressingthis issue in strategy plans. One of the impediments to the use of mobile health applications is concern about the securityof personal health records. Health policy makers need to set standards fornational and personal health records and cooperate with the private sector tosecure privacy. For the development of behavioral changes in individuals, the public should be informed and encouraged to public health spots in the public spots to spread mobile health benefits within society. Health workers should also be equipped with sufficient information about mobile health practices and be able to direct individuals appropriately.

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