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EVALUATING THE ACCESSIBILITY OF CENTRALIZED DOCTOR APPOINTMENT SYSTEM

MERKEZİ HEKİM RANDEVU SİSTEMİ (MHRS)'NİN ERİŞİLEBİLİRLİK SEVİYESİNİN DEĞERLENDİRİLMESİ

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ABSTRACT

Health Transformation Project has been implemented by Ministry of Health at Republic of Turkey. This project aims to achieve more effective and efficient health services in Turkey. In this context Centralized Doctor Appointment System (CDAS) has been actualized as one of the most important application of Health Transformation Project.

The study aims to determine the accessibility level of CDAS (Central Doctor Appointment System) applications. It also try to determine the usage rates and levels of CDAS. In this direction comprehensive survey questions asked to patients who visited to Giresun Prof. Dr. A. İlhan Özdemir State Hospital within all legal permissions. The obtained findings determined with the SPSS 20.0 program. Based on the findings of this study, one can conclude that the users of CDAS could access CDAS applications easily, and they are satisfied with using it for health appointments.

Keywords: Accessibility, CDAS, E-Health, Online Appointment, Health-Net.

ÖZ

Türkiye Cumhuriyeti Sağlık Bakanlığı tarafından daha etkin ve verimli sağlık hizmetleri sunulmasını amaçlayan Sağlıkta Dönüşüm Projesi uygulanmaktadır. Bu proje kapsamında Merkezi Hekim Randevu Sistemi (MHRS) hayata geçirilmiş ve Sağlıkta Dönüşüm Projesinin en önemli uygulamalarından birisi olmuştur.

Bu çalışma MHRS uygulamalarının erişilebilirlik düzeylerini belirlemeyi amaçlamaktadır. Çalışma ayrıca MHRS' nin kullanım oranları ve kullanım düzeylerini de belirlemeye çalışmaktadır. Bu doğrultuda Giresun Prof.Dr. A. İlhan Özdemir Devlet Hastanesi'ni ziyaret eden hastalara izinleri alınarak kapsamlı anket soruları yöneltilmiş ve elde edilen veriler SPSS 20.0 programı ile değerlendirilmiştir. Çalışmanın bulgularına göre MHRS kullanıcılarının MHRS sistemine kolaylıkla erişebildikleri ve hastane randevuları için bu sistemi kullanmaktan tatmin oldukları sonucu elde edilmiştir.

Anahtar Kelimeler: Erişilebilirlik, MHRS, E-sağlık, Çevrimiçi Randevu, Sağlık-Net.

1. INTRODUCTION

In today's ever changing world, live is inescapably going digital. In light of this, related services are being provided through the Internet, or better known as "Electronic Concepts". E-Health is the one of these e-concepts that is developing rapidly worldwide and within Turkey. In general, e-health consists of all kinds of information and communication technologies and their applications within the health system context.

According to the World Health Organization (WHO), e-health is "the cost-effective and secure use of information and communication technologies in support of health and health-related fields, including health-care services, health surveillance, health literature and health education, knowledge and research" (WHO, 2005).These applications use technology for improving the health of patients, independent access to health

services, its speed and ease of use, and for also providing more effective and efficient services to all stakeholders in the health sector. It can be said that electronic health applications taking full advantage of information and communication technology the benefit of citizens.

These advantages include accurate, fast, and uninterrupted access of information as requested by patients, health managers, and health staff, as well as the dissemination of electronic health services globally. The Health Transformation Project has thus been developing Saglik.Net in Turkey. Saglik.net is an electronic record system that embraces all of citizens, providing individuals with the chance to access her/his own information from birth records to all aspects of her/his health. It has an encompassing communication infrastructure with a high bandwidth. Additionally, the project is designed for recording all of the movable. Immovable, administrative, financial, and labour data regarding all of the health organizations. Sağlık.NET, includes different applications and services with several aims.

The Centralized Doctor Appointment System (CDAS) is one of the most important projects in terms of health transformation in Turkey. The CDAS is an application that facilitates appointments from subsidiary public hospitals, family physicians, and oral-dental health centers affiliated with the Ministry of Health by calling the "Alo 182"CDAS Call Center, using the CDAS.gov.tr website, or by using CDAS mobile applications. It is also unblocking barriers, facilitating the access of services, and effectively increasing the overall quality of service.

This study aims to determine the accessibility level of CDAS-related applications. In this context, a survey was given to patients of the Giresun Prof.Dr. A. İlhanÖzdemir Public Hospital. The quantitative data was analyzed using SPSS (Statistical Package for Social Sciences) 20.0.

2. LITERATURE REVIEW

2.1. E-health and E-health in Turkey

E-health is short for electronic health and consists using of electronic information and communication technology in the health sector. E-health emerged in the early 21st century and has spread around the world. Countries are now race to apply e-health systems that promise better and improved healthcare services to individuals and communities.

In general, e-health infers the application of computers and networks that collect, restore, analyze, store, and manage health data and information. It includes information and data sharing between patients and health service providers, hospitals, health professionals, and health information networks, electronic health records, telemedicine services, portable patient-monitoring devices, operating room scheduling software, and robotized surgery. It is also used in unifying health records, rapid communication with patients, sharing medical information, and monitoring results.

In essence, e-health is the combination of public health and medical information through the internet and computer technology. With e-Health, important information about your health is available when and where necessary.

E-health is necessary for solving problems faced by healthcare systems with a growing demand, due to an ageing population, improved treatments, and limited resources (Stevenson et al., 2016). According to Alvarez (2002), e-Health is a consumer-centered model of health care where stakeholders collaborate and utilize information and communication technologies, including Internet technologies to manage health, arrange, save, monitor, deliver and account for care, and manage the health care system. E-health can also help keep health care affordable (Alvalez, 2002).

According to Doğaç and his colleagues, one of the main components of this program is achieving e-health with the following objectives (Doğac et al.,2014):

- ✓ Ensuring the standardization of data used in healthcare
- ✓ Creating the Electronic Health Record for citizens
- ✓ Data analysis support for managers (Decision Support System)
- ✓ Speeding up the flow of information among stakeholders
- ✓ Saving resources and increasing efficiency in the healthcare system.

E-health is an emerging field in the intersection of health authorities and professionals, nationally and internationally, from the doctor to the hospital manager, nurses, data processing specialists, social security administrators, patients, and personalized health systems for individuals and their communities. This noted,

the term entails not only technical development but is also a tool for taking decisions and improving health care locally, regionally, and worldwide.

It is a comprehensive topic and has different stakeholders such as doctors, the government, patients and their families, nurses, health managers, web and mobile programmers, database developers, technology and health device manufacturers, the electronic and computing sectors, and the community at large with naturally different benefits and goals for each party. According to Shneiderman and Bradford (2007), the health system has four basic goals with different aspects for stakeholders (see Figure-1).

Figure 1: Goals and Benefits of e-health

	Safety	Effectiveness	Patient-centeredness	Timeliness
Patient	High-quality care free of complications	Evidence-based standards of care	Ongoing support for life goals, values	Reliable service when needed
Physician	System protections against error	Knowledge management for best practice	Support for tracking, personalization	Work flow engineered for proactive care
Family, friends	Caregivers help monitor for risk	Access to effective support tools	Support roles for caregivers clear, defined	System responsiveness for caregivers
Microunits of care	Team delivery reduces error	Consistent application of guidelines	Team awareness of patient needs	Enhanced coordination
Community	Monitoring for quality assurance	Research-tested community intervention	Identifying and meeting local needs	Efficiency through partnering
Organizations for care (hospitals, HMOs)	Safety as a system property	Data based management	Interoperable systems for patient support	Continuous quality improvement
Public health environment	Surveillance, preparedness	Informatics support for public health	Equitable protections for health	Infrastructures for rapid response
Healthcare context	Culture of safety	Policy informed by evidence	National standards for transportability	Efficient delivery and reimbursement of care

In other words, e-health is a big network that is formed from other networks between these stakeholders. These networks can remove time and distance barriers between the flow of health information and can help ensure that collective knowledge is efficiently brought to bear for health problems worldwide (Harrison and Lee, 2006). Eysenbach (2001) notes e-health systems have several properties. These properties are identified as e-health's 10 E.

- ✓ **Efficiency**: One of the promises of e-health is to increase efficiency in health care, thereby decreasing costs. One possible way of decreasing costs would be by avoiding duplicative or unnecessary diagnostic or therapeutic interventions, through enhanced communication possibilities between health care establishments and through patient involvement.
- ✓ **Enhancing quality of care:** Increasing efficiency involves not only reducing costs, but at the same time improving quality. E-health may enhance the quality of health care by allowing comparisons between different providers, involving consumers as additional power for quality assurance, and directing patient streams to the best quality providers.
- ✓ **Evidence based:** E-health interventions should be evidence-based in the sense that their effectiveness and efficiency should not be assumed but proven by rigorous scientific evaluation. Much work and research still needs to be done in this area.
- ✓ **Empowerment** of consumers and patients by making the knowledge bases of medicine and personal electronic records accessible to consumers over the Internet. E-health opens new avenues for patient-centered medicine and enables evidence-based patient choice.
- ✓ **Encouragement** of new relationships between the patient and health professional, one towards a true partnership whereby decisions are made in a shared manner.
- ✓ **Education** of physicians through online sources (continuing medical education) and consumers (health education, tailored preventive information for consumers)
- ✓ **Enabling** information exchange and communication in a standardized means between health care establishments.
- ✓ **Extending** the scope of health care beyond its conventional boundaries. This is meant in both a geographical sense as well as in a conceptual sense. E-health enables consumers to easily obtain health services online from global providers. These services can range from simple advice to more complex interventions or products such a pharmaceuticals.
- ✓ **Ethics**: e-health involves new forms of patient-physician interaction and poses new challenges and threats to ethical issues such as online professional practice, informed consent, privacy and equity issues.

- ✓ **Equity:** Making health care more equitable is one of the promises of e-health, but at the same time there is a considerable threat in that e-health may deepen the gap between the "haves" and "have-nots". People lacking the money, skills, and access to computers and networks cannot use computers effectively. As a result, these patient populations (which would benefit the most from health information) are those who are the least likely to benefit from advances in information technology, unless political measures ensure equitable access for all. The digital divide currently runs between rural vs. urban populations, rich vs. poor, young vs. old, male vs. female people, and between neglected/rare vs. common diseases.

The government is helping the healthcare sector to develop more e-health services, giving people easier access to care and a better understanding of their own health. In Turkey, a lot of e-health services pass on successfully within the conversion process of the national health system. E-health studies that are have been professionally conducted by the Turkish Ministry of Health are based on the studies on Turkey's 2003-established Health Information System Action Plan (Nihat, 2008). The Turkish Ministry of Health declared the vision of e-health studies as the "sharing a functional database in a high-bandwidth, and that is a communication backbone of whole country formed through the participation of all national health sector stakeholders, is accessible to authorized persons, institutions, and the public, encompasses all citizens, and holds data spanning birth to death" (Akpınar et al.,2007).

National health services are carried within Turkey's Health-Net project. Health-Net is the conversion of the existing LAN-WAN into a true health network platform providing linkage, services, and data repositories to all authorized parties in the health sector. The Health-Net Platform should be recognized, respected and trusted as the secure national platform for all Health Information systems or services (Nihat, 2008).

Health-NET is an integrated and expandable information system that aims to improve the efficiency and quality of healthcare services, and presents a pool containing each and every person's data. E-health is a fast information and communication platform that is capable of collecting information in a proper format and producing proper information for shareholders in the health sector in order to increase quality and obtain benefits (Turhan et al., 2008).

The Health-Net provides integrated, fast, and secure information and communication services that collect data produced in health institutions directly from where that information is generated. The main purpose of the system is to increase the efficiency in health services by generating appropriate information for all stakeholders from the corresponding data (Naralan et al., 2013).

In addition, it is a system that securely and privately collects all data into a central source and shares only authorized persons for using managerial and scientific studies according to national and international standards (Ceylan, 2015). In this context, Health-net is very effective in terms of collecting what determines national health politics and quality.

Several examples of Health-Net include The National Health Information System (NHIS), Tele-Medicine, the National Health Data Dictionary (NHDD), the Centralized Doctor Appointment System (CDAS), Electronic Health Records (EHRs), E-Pulse, the National Health Data Standards (NHDS), Tele training, the Decision Support System (DSS), the Doctor Information Bank (DIB), and the Public Health Information System (PHIS).

2.2. Centralized Doctor Appointment System (CDAS)

The Centralized Doctor Appointment System (CDAS) is the most widely used system in e-health and is also the best example of the improvements made in the Turkish Health System. The system aims to deliver health service to all citizens within a short-period of time across Turkey. It has decreased the wasted time of doctors and patients and increased the quality of service they aim to provide. It is also ensures the sensible usage of sources.

The CDAS is a national project in which a patient can make an appointment for all public hospitals, oral and dental health centers, and family physicians across Turkey. CDAS is one of the 20 public service approved and approved by European Union and since 2012 encompasses every region of the country. At the same time, it holds the claim of being the first and only system in the world that manages public hospitals' appointment systems from a single centre.

The objectives of CDAS[1] include;

[1] www.saglik.gov.tr

- ✓ Removing the pre-examination waiting period in hospitals and providing a more peaceful and quiet environment for everyone by reducing hospital and polyclinic crowds. The objective is for citizens to manage their own time properly.
- ✓ Helping to improve health policies through CDAS data by increasing the efficiency and quality of health services on the condition that resource usage and distribution in hospitals is measured.
- ✓ Ensuring effective use of the workforce of the physicians in the hospital.

Kerman states that CDAS contributes to effective time management for doctors, patients, and hospitals, the identification of the needs of personnel and medical equipment, pointing decision makers in the direction of designing better health policies (Kerman, 2014). The other advantages of the CDAS include (Tarcan et al., 2013):

- ✓ Increasing productivity by optimally providing better hospital resource use.
- ✓ Preventing long wait times by make an appointment prior to examinations.
- ✓ Establishing a more quiet and peaceful environment in hospitals.
- ✓ Facilitating the examination process.
- ✓ Increasing patient satisfaction by giving the patients a chance to choose their doctors and hospitals.
- ✓ Providing important input to senior level decision makers on strategic issues such as demand forecasting, measuring market share and the competitiveness of hospitals and doctors, planning and allocating of the workforce, etc.
- ✓ Assisting the development of health policies through CDAS data.

The Centralized Doctor Appointment System (CDAS) enables all citizens to make appointments in any public healthcare establishment, family physicians, and/or oral and dental health centres by calling the CDAS call centre via "Alo 182", or online through the CDAS Web Portal and any CDAS Mobile Application for Android, iOS, Windows Phone, Blackberry upon the confirmation of one's personal Turkish Citizenship ID Number. The system then enables the patient to select her/his city, hospital, policlinic, doctor, and time. The system also allows for the monitoring and cancellation of appointments independent of time and space.

3. METHODS

3.1. Population and Sample

The cross-sectional study was conducted at the Giresun Prof. Dr. A. İlhan Özdemir State Hospital. The sample of study included patients visiting this hospital for policlinic services, and who were between the ages of 18 - 65, literate, and chose to participate in the survey. Patients were first briefed about the study and then were asked whether they wanted to participate.

Sampling was based on simple random sampling design and was done between April and July 2015. The sample size of the study was calculated over the 2015 number of outpatients. 384 people were calculated as having a 95%confidence level and a 5% precision level. A total of 500 people participated in the study.

Table-1 is a useful guide for determining the sample size needed to calculate a different combination of levels of precision, confidence, and variability (Yazıcıoğlu and Erdoğan, 2004).

Table 1: Sample size for ±3%, ±5% and ±10% Precision Levels Where Confidence Level is 95% and P=.5.

Sample Size	± 0.03 (d)			±0.05 (d)			±0.10 (d)		
	p=0.5 q=0.5	p=0.8 q= 0.2	p=0.3 q=0.7	p=0.5 q=0.5	p=0.8 q= 0.2	p=0.3 q=0.7	p=0.5 q=0.5	p=0.8 q= 0.2	p=0.3 q=0.7
100	92	87	90	80	71	77	49	38	45
500	341	289	321	217	165	196	81	55	70
750	441	358	409	254	185	226	85	57	73
1000	516	406	473	278	198	244	88	58	75
2500	748	537	660	333	224	286	93	60	78
5000	880	601	760	357	234	303	94	61	79
10000	964	639	823	370	240	313	95	61	80
25000	1023	665	865	378	244	319	96	61	80
50000	1045	674	881	381	245	321	96	61	81
100000	1056	678	888	383	245	322	96	61	81
1000000	1066	682	896	384	246	323	96	61	81
100 million	1067	683	896	384	245	323	96	61	81

The minimum sample size is 370 at a ±0.05 precision level, whereby p=0.5 (maximum variability) and q=0.5 (minimum variability) for the 885,435 outpatients in 2015. In this study the sample size is 500 so it can be said that sample size is able to represent population.

3.2. Data Collection and Evaluation

Data was collected using a survey method. A survey that included questions about demographic properties of patients and the accessibility level of the CDAS system was utilized. A five-item Likert scale was used: **"**Strongly agree, 5", "Agree, 4", "Don't know, 3", "Disagree, 2", and "Strongly disagree, 1".

SPSS (Statistical Package for Social Sciences) 20.0 was used for evaluating the data. The sense of accessibility was used for dependent variables and demographic properties were used as independent variables. P<0.05 was accepted for the significance level of statistical tests. Descriptive statistics such as number, percentage, mean and standard deviation, alongside Kruskal-Wallis, correlation, and chi-square analysis were used.

3.3. Hypotheses

The study tested the following hypothesis;

$H0_1$: There isn't a meaningful correlation between gender and CDAS accessibility.

$H1_1$: There is meaningful correlation between gender and CDAS accessibility.

$H0_2$: There isn't a meaningful correlation between marital status and CDAS accessibility.

$H1_2$: There is a meaningful correlation between marital status and CDAS accessibility.

$H0_3$: There isn't a meaningful correlation between education level and CDAS.

$H1_3$: There is meaningful correlation between education level and CDAS accessibility.

$H0_4$: There isn't a meaningful correlation between living place and CDAS accessibility.

$H1_4$: There is a meaningful correlation between living place and CDAS accessibility.

$H0_5$: There isn't a meaningful correlation between monthly income level and CDAS accessibility.

$H1_5$: There is a meaningful correlation between monthly income level and CDAS accessibility.

$H0_6$: There isn't a meaningful correlation between chronic disease and CDAS accessibility.

$H1_6$: There is a meaningful correlation between chronic disease and CDAS accessibility.

$H0_7$: There isn't a meaningful correlation between age and CDAS accessibility.

$H1_7$: There is a meaningful correlation between age and CDAS accessibility.

4. RESULTS

The demographic properties and general health status of sample is shown in Table 2.

Table 2 -Demographic Properties of the Sample Group

Variables		**Number (n)**	**Percentage (%)**
Gender	Female	314	**62.8**
	Male	186	37.2
Marital Status	Married	231	46.2
	Single/Divorced	269	**53.8**
Education Level (n:497)	Primary education	116	23.34
	High school	143	28.77
	University	229	**46.07**
	Graduate/postgraduate	7	1.4
	Other (illiterate etc.)	2	0.4
Place of Residence (n:487)	City	310	**63.65**
	County	124	25.46
	Town	5	1.02
	Village	48	9.85
Employment Status (n:490)	Working	175	35.71
	Not Working	315	**64.28**
Monthly Income (n:496)	No income	196	**39.51**
	Under 1000 TL	32	6.45
	Between 1001-1500 TL	110	22.17

	Between 1501-2000 TL	73	14.71
	2001 TL and above	85	17.13
Chronic disease (n:498)	Yes	88	17.67
	No	410	**82.32**
Total Work Experience	Less 1 year	41	16.26
	1-5 years	86	**34.12**
	6-10 years	52	20.63
	11 years and above	73	28.96
Any Disability (n:498)	Yes	9	1.8
	No	489	**98.19**
Reason of arrival to hospital (n:493)	Consultation	431	**87.42**
	Display results	3	0.6
	Control	32	6.49
	Emergency	8	1.62
	Chronic disease	19	3.85
Age	10-20	86	17.2
	21-30	225	**45**
	31-40	91	18.2
	41-50	81	16.2
	51 and up	17	3.4

As is seen in Table 2, the percentage age of participants is 26.7. 62.8% of participants are women. 53.8% of the women are single and 46.07% are university graduates. 63.65% of the participants live in city center, 64.28% are unemployed and 39.1% have no income. 83.32% of participants don't have any chronic diseases; 98.19% lack any disability. 87.42% of participants visited the hospital for consultation.

Data about relations between access of CDAS system and demographic variables is provided in Table 3.

Table- 3: The correlation between CDAS system access and demographic variables

		CDAS mobile application		**CDAS.gov.tr website**		**Calling "Alo 182"**		**Coming to Hospital**		**X^2**	**p**
Variables		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**		
Gender	**Female**	47	56,63	90	60.81	173	65.53	2	66.67	2.4575	0.48
	Male	36	43.37	58	39.19	91	34.47	1	33.33		
Marital Status	**Single**	64	77.10	89	60.16	112	42.43	3	100	37.62	0.00
	Married	19	22.89	59	39.84	152	57.58	0	-		
Education Level	**Primary school**	5	6.02	11	7.43	99	37.93	-	-	94.15	0.00
	Highschool	19	22.89	42	28.38	82	31.42	-	-		
	University	56	67.47	90	60.81	79	30.27	3	100		
	Graduate and postgraduate	3	3.61	4	2.70	-	-	-	-		
	Other (illiterate etc.)	-	-	1	0.68	1	0.38	-	-		
Living Place	**City**	57	72.15	89	61.38	162	62.79	-	-	28.41	0.00
	County	21	26.58	44	30.34	56	21.71	3	100		
	Town	1	1.27	10	6.90	37	14.34	-	-		
	Village	-	-	1	0.69	3	1.16	-	-		
	Other	-	-	1	0.69	-	-	-	-		
Monthly Income	**No income**	35	42.17	69	47.26	89	33.97	2	66.67	30.82	0.00
	Under1000 TL	4	4.82	8	5.48	20	7.63	-	-		
	Between 1001-1500 TL	11	13.25	19	13.01	79	30.15	1	33.33		
	Between 1501-2000 TL	13	15.66	19	13.01	41	15.65	-	-		
	2001 TL and above	20	12.60	31	21.23	33	24.10	-	-		
Chronic disease	**Yes**	8	9.76	21	14.19	58	22.05	-	-	8.92	0.03
	No	74	90.24	127	85.81	205	77.95	3	100		

Table 3 shows the relationship between CDAS system access and other variables. It was found that 65.53% of women had used "Alo 182" for appointments, and that 34.47% of men used " Alo 182" (x^2: 2.4575;p=0.48; p>0.05). No relationship between the two genders was found. This rate for single participants was 43.43% (x^2: 37.62;p=0.00; p<0.05). Remarkable results were found regarding education level. 37.93% of primary school graduates were identified using "Alo 182", while 60.81% of university graduates used CDAS.gov.tr website (x2: 94.15;p=0.00; p<0.05). Both urban as well as rural participants also preferred "Alo 182"(x2: 28.41;p=0.00; p<0.05).Participants with no income said as well as those with an income of more than 2001 TL both preferred using "Alo 182". This conclusion showed that fluctuations in income level bared no influence on preference (x^2: 30.82;p=0.00; p<0.05). Participants with chronic disease also appeared to prefer calling " Alo 182"(x^2:

8.92;p=0.03; p<0.05). The Kruskal-Wallis test was used for analyzing the relationship between CDAS system access and age. The data from this is shown in Table 4.

Table-4: The relationship between CDAS system access and age.

Variables	n	Median	Maximum	Minimum	X^2	p
CDAS mobile application	83	25	50	15	28.44	2.93
CDAS.gov.tr website	152	25.5	63	16		
Call " Alo 182"	269	32	67	15		
Coming into the hospital	3	22	22	20		

269 of the participants said that they used "Alo 182", however no meaningful correlation between age and CDAS access was found(x^2: 28.44; p=2.93; p>0.05).

5. CONCLUSIONS

In today's world, one of the most important issues in terms of public sector activity is the implementation of public e-services and its effectiveness. With this in mind, the Turkish Ministry of Health has developed an online appointment system including all public hospitals, family physicians, and oral and dental health centers.

The effectiveness of e-services is based on the public's ability to access it. This study aimed to analyze the relation between accessibility level of CDAS system and the demographics of those accessing it.

What has been found is that there is an important correlation between education level and CDAS access via mobile devices. A meaningful statistical difference cannot be made regarding gender. Both women and men a like mentioned that they can access CDAS system by themselves without guidance. According to the aforementioned hypotheses, there also is no meaningful correlation between age and CDAS access. As most of the those in the sample group were younger than 40, it can be said that their technology skills are strong.

There appears to be differences between using CDAS system types. It has seen that income level has no influence on preferring the available website over mobile applications, however53.01% of participants stated that they preferred calling "Alo 182". This finding is interesting result because "Alo 182" is not free of charge. Those with no or low income had mentioned too that they used "Alo 182" for making appointments. Another hypothesized reason is that, in the case of rural Giresun, most villages lack proper—if any—Internet access.

The results of this study have concluded that are no evident access problems and that most users can independently access the CDAS system without assistance---this, with the exception of the CDAS mobile application having update problems. Furthermore, the CDAS website has a captcha that requires a mobile phone and e-mail verification in order to make an online appointment. These areas pose challenges to users, and entails that the current system should be improved upon in order to enhance accessibility and customer services.

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