

Evaluation of patients' satisfaction on booking appointment system in dental school of Isfahan during 2018

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Abstract

Background: With the development of technology in recent years, booking appointment software systems have gained special and significant popularity among physicians and patients. As Medical university of Isfahan is one of the leading universities of the country the results of this study could be very important for the use of other health systems in different states of country. This research aimed to assess the patients' satisfaction of the booking appointment system services of Isfahan dentistry faculty, considering its different types of booking systems and patient satisfaction.

Methods: The study was descriptive and cross-sectional. The questionnaire was prepared using Zhang study in 2014 and the standard Forward-Backward translation method. In order to investigate the validity, the opinions of the professors of Isfahan Dental School were taken and the professional opinions of the individuals were applied. The questionnaire was distributed among patients referring to the dental school who had undergone the initial examination. After completing the data, SPSS software version 20 and descriptive and analytical statistical tests were used to analyze the data ($\alpha = 0.05$).

Results: In this study, independent t-test, Kruskal-Wallis test and Pearson correlation test were used to investigate the data. The Kruskal-Wallis test showed that overall satisfaction was significantly higher in patients who booked appointment online than in other patients ($P = 0.003$). The independent t-test showed that the mean scores of patient satisfaction with staff behavior ($P = 0.03$) and satisfaction with the waiting time ($P = 0.01$) were significantly different between native, non-native and passenger patients.

Conclusion: Most of the people surveyed were generally relatively satisfied with the booking appointment services. Most of them surveyed came in person to queue. Most people cited cheap services as the main reason for their visits. Most people cited telephone busy signal as the reason for not using the telephone booking system.

Background

Knowledge of Patients' satisfaction with the services provided to eliminate possible defects is necessary because of its crucial role in health system management planning (1).

Increasing the Patients' satisfaction with health system can improve the general health. Patients' contact with each other and also with hospital begins from the reception part. So, patients' and their companions' evaluation of hospital services starts from the reception. This section plays an important role in creation of positive or negative attitude among clients that can affect the acceleration or delay of the patients' recovery. (2)

With the development of technology and infrastructure, Internet access has been increased and provided many capabilities to human beings.

One of these options that has been delivered to the health system is booking websites. These sites have made it possible for the patients to set doctors' appointments on the web having access ability to the table of physician's attendance time, pay for the appointment and even cancel it, without in person referral. Traditional methods of queuing put a lot of pressure on clinic employees. However, there are a few researches about the effectiveness of booking appointment system on the web. (3)

Nakhai et al, considered the assistant physicians and physicians' attitudes toward Kerman private offices booking status without any previous researches done to nationwide identify and troubleshoot booking problems. This study contemplates Simultaneous use of Internet and Interactive Voice Response (IVR) as the best method of booking. (4)

According to the research of Adnan Aktype et al, online booking method decreases queuing alignments and patients' waiting time. It also saves more time of physicians and eventually increase patients' satisfaction and quality of service delivery. (5)

A systematic review done by Peng Zhao et al, indicated that online booking enhanced the access to health services. (6)

Based on J.Vissers study, one of the main reasons for the long waiting time of outpatients in hospitals is the improper design of booking systems (7).

Considering the research of Heidari et al, Mechanized telephone booking appointment systems, while low cost and easy to use, have played an important role in increasing satisfaction. (8)

Medical university of Isfahan online booking system could be done by the patient using <http://nobat.mui.ac.ir/tcs> (figure 1) to enter the comprehensive online a booking portable of Isfahan medical university and then choose the dental faculty booking option. This part includes reservation sections, doctors' weekly program, cancel the appointment, and follow the appointment, user guide and appointment notification. It is possible to receive a medical appointment from the booking system from 8 O'clock in the morning for the next day. Patients choose their desired date to find the empty appointments and referral hours. After setting the appointment, the patient enters his/her name, last name, national code, phone number, type of insurance, etc. Finally, the tracking code will be received. If the appointment is canceled or changed, a message will be sent to the patient. Additionally, if the patient cancels the appointment, s/he will not be given an appointment for two weeks.

In virtual phone system, services such as booking, canceling the appointment and doctors' weekly program are provided by calling the telephone number 36703013. Some Information like phone number, national code, tracking code are given to the patient for the referral.

According to a recent report released by the Information Technology Organization of Iran, the highest internet penetration rate is amongst students with 89.6 percent in 2020 (9).

As Medical university of Isfahan is one of the leading universities of country the results of this study could be very important for the use of other health systems in different states of country. This research aimed to assess the patients' satisfaction of the booking appointment system services of Isfahan dentistry faculty, considering its different types of booking systems and patient satisfaction.

Methods

This cross-sectional and descriptive research has been done on patients referred to Isfahan dentistry faculty diagnosis department during 2018. Simple random sampling method was used with 384 samples. The responses were performed with 95% confidence and maximum error of 0.05. The Initial questionnaire was prepared based on a Zhang study in 2014 (10) translated by standard method and then validated by 8 professors from Isfahan dentistry faculty. Their professional opinions were applied. An interview was conducted with the head of public relations and the security officials of the faculty and the nurses of the departments in the field of shifts.

To ensure the reliability of the questions 5,6,7,8,9,10,11,12 and 13, the Cronbach's alpha coefficient was calculated by SPSS software and the number was 0.7. The data collection method included a questionnaire containing 30 questions with two sections: 12 questions about demographic information of patients and 18 questions about satisfaction with the booking process. The Inclusion criteria were patients over the age of fourteen who referred to the diagnosis department of Isfahan dentistry faculty between April and June 2018 receiving a medical appointment by telephone or in person. After that, their examination process was completed in addition to filling out informed consent Letters wishing to participate in the questionnaire. Illiterate people and people who were reluctant to answering the questionnaire were excluded from the study.

The questionnaire was given to the patients by the researcher. Patients were asked to choose the best answer of their own after careful consideration. The researcher was present at the place to resolve possible ambiguities for the participating patients until the end of answering the questions. After collecting all the questionnaires, the data were recorded in the SPSS software. The data were analyzed via SPSS version 20 and Analytical descriptive statistical tests and independent T ($\alpha=0.05$).

Results

Patients' Ages ranged from 14 to 59 with the average 32.1 and standard deviation 9.9 years old. The frequency distribution of marital status, level of education, place of residence and monthly income level of the people surveyed are specified in the table 1.

Most of the patients (69%) were married. Most of them (46.8%) had diploma. Most of them were natives (71.1%) of Isfahan. Additionally, the monthly income of most of them (54.2%) was less than \$ 65.

Most of the participants (68.8%) were relatively satisfied with the queuing services (graph 1) (table 2).

The Kruscal-Wallis test showed that there was no significant difference between the convenience of the medical appointment ($p=0.15$) process and the re-appointment ($p=0.32$) in case of oral disease among people who booked appointment in three different ways but Overall satisfaction was higher in patients who received online medical appointments than in other patients ($P=0.003$) (table 3)

Average of Patients' satisfaction score on staff behavior was 49.6, with standard deviation 23.1. Average score of patients' satisfaction on waiting time was 44.7 with standard deviation 24.1 out of 100. (Table 4)

Most of the patients (46.5%) believed that busy phone line was cited as the reason for not using the virtual booking system. (Table 5)

Independent T test indicated that the average score of patients' satisfaction on staff behavior ($p=0.03$) and their satisfaction on waiting time ($P=0.01$) among native, non-native and passengers were significantly different. In fact, both scores were higher for natives and passengers' average score of satisfaction on waiting time was higher than that of non-natives'. (Table 6). As Isfahan is one the large city in the center of country, some of the patients travel to this city for treatment even from neighbor countries such as Iraq and Afghanistan.

Discussion

This research has considered patients' satisfaction on booking services of dental faculty of Isfahan. As up to date booking, appointment methods have been used from 2017 in dental faculty of Isfahan and no previous research has been done on this context, so it seemed necessary to evaluate the satisfaction on booking method in this study. As Medical university of Isfahan is one of the leading universities of country the results of this

study could be very important for the use of other health systems in different states of country. In this research, most of the patients were relatively satisfied with booking services. A significant relationship was observed between the booking method and the level of satisfaction. Patients who had used online booking were more satisfied compared to others. Average score of satisfaction with the waiting time among native patients of Isfahan was higher than that of passenger patients and among passenger patients was higher than that of non-native patients.). As Isfahan is one the large city in the center of country, some of the patients travel to this city for treatment even from neighbor countries such as Iraq and Afghanistan.

In a study by Bastani et al, on the subject of evaluating the online booking system and websites of health care centers of Iran University of Medical Sciences in 2014, a small number of people used web based booking system. (2) In that study, most appointments were made in person which is inconsistent with the present study since totally 57% of the patients didn't use in person queuing.

In the present study, only about 30% of patients used online booking system. In fact, the researchers concluded that it was simply a matter of arranging appointments with online websites, and that virtual booking service was not considered as a part of not-attendance appointment booking systems. In Cao's research about the effect of online booking system on waiting time reduction, only 17% of the patients used web based appointment system and more than 50% of them weren't aware of online appointment booking system.(3)

In the present study, 30% of the patients used web based booking system and 50% of them knew about the absentee appointment booking system. Only 19% of the patients did not used absentee booking system after getting informed of that. Based on Nakhai et al, a study about appointment booking systems of private offices in Kerman, the most disaffection was with usual queue method and telephone appointment booking services (4).

The overall satisfaction of patients who booked online appointment was significantly higher than that of other patients. (4)

In the present study, despite the problems related to phone-call based appointment system and usual queue method, most people arranged appointments in these two methods. Among the people who had used online, telephone and usual queuing for booking appointments, the overall satisfaction was significantly higher with the online booking service.

Aktepe et al, found that online booking system had reduced usual queuing and waiting time. It actually saved doctors' time and increased the quality of booking and patients' satisfaction. (5)

In our research, the overall satisfaction among the patients who used online appointment services was significantly higher than the other patients' (P=0/003)

In the study of Maeder et al, about web self-service applications in primary healthcare, it was indicated that arranging online appointment seemed to be so important and most of the patients had used this service again after using it once. (9) But It is contrary to the results of our study.(P=0.15) The convenience of booking appointment process and rebooking in case of oral disease was not significantly different between people who booked appointments in 3 different ways.

Based on the study of Zhang et al, about patients' experience of web based appointment system using online appointment websites in a hospital in China, the most tolerable waiting time for visiting the doctor was 30 minutes.(10) This time was about 10-20 minutes in our study. Additionally, in Zhang's research, satisfaction with the waiting time (P=0.01) was significantly different among native, non-native and passenger patients. In our study, it was the same and can be because of the different cultures and the habit of the native patients to this type of booking appointment system. In Zhang's research, there were no considerable differences in views by patients' age, occupation and income.

In the study of Pakdaman et al, titled evaluating the level of patients' satisfaction-comparing comprehensive treatment with other departments of Dental treatment at Tehran University of Medical Sciences, booking appointment service and waiting time have been one of the most important causes of dissatisfaction plus the lowest score of satisfaction. (11)

It is inconsistent with the results of the present study indicating that most of the subjects (68.8%) were generally relatively satisfied with the booking appointment services.

It seems that Pakdaman's study has reached a conclusion with only one question about the satisfaction of the booking system, while various factors can be considered in examining patients' satisfaction with the booking system. No contract or explanation has been given on how to make appointments in this center. In the present study, several questions have been used to examine patients' satisfaction with booking appointment services and various factors affecting satisfaction.

In the study of YU et al, titled booking appointment systems in Chinese hospitals, most people were oriented toward the method. The booking appointment system was announced by the information brochures in the hospital, and the second most common method of acquaintance was by friends and relatives. Also, in this study, only about 13% of people considered telephone busy signal as the reason for not using the telephone booking system. (12)

In the present study, most people were introduced to the booking system through friends and acquaintances, and therefore the most common way of informing was via brochures. Both of these ways were the most important patient options for familiarity with the booking system, although there

were differences between distributions of options in two studies.

Contrary to YU's study, the most common reason for not using the telephone booking system was the busy signal of that. In both studies, the least frequent option was the use of absentee booking systems, due to a lack of knowledge about the choice of department for queuing. In the research of Huang et al, about practice and exploration of appointment registration service for outpatients in Modern Hospital In 2012, most people introduced the method of familiarity with the booking appointment system through the media, which is contrary to our study indicating that media was the least common way.

Conclusion

Most of the people surveyed were generally relatively satisfied with the booking appointment services. A significant relationship was observed between the way of booking appointment and satisfaction. People who used online appointment system were more satisfied than others. The average score of satisfaction with the waiting time among native patients of Isfahan is higher than that of passenger patients and the passenger patients' were higher than that of non-native patients.

Restriction And Recommendation

One of the problems was that there were very few studies on this subject. Today, due to the increasing use of mobile phones and as their applications welcomed by the general public, the design or use of software with easy use and preferably offline is recommended. Today, many companies in Iran have paid attention to this issue and provide these services, as well as video training for patients to book appointment online, get advice from leading companies in designing booking appointment systems to improve the booking system, encourage patients to book appointment Non-attendance, make it more attractive for the user of the appointment website, and place some links in order to improve oral and dental health.

Abbreviations

IVR: Interactive Voice Response

Declarations

Ethics approval and consent to participate

We declare that this manuscript has been approved by ethics committee of Isfahan university of medical sciences. Additionally, written informed consent was obtained from a parent or guardian for participants under 16 years old.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated during and/or analysed during the current study are not publicly available but are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

F.N. supervised the research, H.J. collected the data and analyzed it and Z.A. led the writing and submission.

All authors have read and approved the manuscript

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References

1. Shikhtaheri a, Farzandipoor m, Sadoghi f. Satisfaction of patients to admission units of educational hospitals affiliated to Kashan University of Medical Sciences.jha. 2010; 10 (29):15-20.
2. Bastani P, Garavand A, Abhari S. Evaluation of Internet booking system in Websites of Health Centers Affiliated with Medical Universities in Iran. jhbmi. 2016; 2(4):219-28.
3. Cao W, Wan Y, Tu H, Shang F, Liu D, Tan Z, et al. A web-based appointment system to reduce waiting for outpatients: A retrospective study. BMC health services research. 2011; 11(1):318.
4. Nakhai N, Oroomiei N, Amiresmaili MR, Moghadam MN, Mohammadi B, Mirzaei S, et al. Challenges of Appointment Fixing in Private Physician Offices from the Viewpoint of Physicians and Secretaries.jhad. 2012; 1(3):207-20.
5. Aktepe A, Turker AK, Ersoz S. Internet Based Intelligent Hospital Appointment System. Intelligent Automation & Soft Computing. 2015; 21(2):135-46.
6. Zhao P, Yoo I, Lavoie J, Lavoie BJ, Simoes E. Web-Based Medical Appointment Systems: A Systematic Review. jmir. 2017; 19(4).
7. Vissers J. selecting a suitable appointment system in an outpatient setting. Medical Care. 1979:1207-208. Jones R, Menon-Johansson A, Waters A, Sullivan A. eTriage—a novel, web-based triage and booking service: enabling timely access to sexual health clinics. International journal of STD & AIDS. 2010; 21(1):30-3.
8. Heidari M, Ayazi Z, Imani R, Hosseini S, Mohammadi H, Malekpour A, et al. The effect of automated telephone system on the satisfaction of client in the Imam Ali polyclinic.jskums. 2015; 1710. Vissers J. Selecting a suitable appointment system in an outpatient setting. Medical Care. 1979:1207-20
9. Tehran Times.Internet penetration rate in Iran highest among students: report June 29, 2019 - 11:55 . <https://www.tehrantimes.com/news/437507/Internet-penetration-rate-in-iran-highest-among-students-report>.
10. Zhang M, Zhang C, Sun Q, Cai Q, Yang H, Zhang Y. Questionnaire survey about use of an online appointment booking system in one large tertiary public hospital outpatient service center in China. BMC medical informatics and decision making. 2014; 14(1):49
11. Pakdaman A, Khormali A, Shamshiri AR. Patient satisfaction-comparison of the comprehensive care model with traditional model of delivering dental services in Tehran University of Medical Sciences. jdm. 2013; 26(4):234-42.
12. Yu W, Yu X, Hu H, Duan G, Liu Z, Wang Y. Use of hospital appointment registration systems in China: a survey study. Glob J Health Sci 2013 Sep; 5(5):193
13. Huang L. W. The practice and exploration of appointment registration service for outpatients in modern hospital. Chinese JCRD. 2012; 5(5A):135–136

Tables

Table 1. Frequency distribution of marital status, level of education, place of residence and monthly income level of the patients

variety		Number	Percentage%
Marital status	Single	119	31
	Married	265	69
levelEducation	P.H.D	3	0.8
	Master	29	7.6
	Bachelor	103	26.8
	Associate education	23	6
	Diploma	180	46.8
	Cycle education	35	9.1
	Primary school	11	2.9
Residence	Native of isfahan	273	71.1
	Non-native	84	21.9
	Passenger	27	7
(toman) Monthly income level	Less than 1 million	208	54.2
	1- 2 million	147	38.3
	2-5 million	29	7.5

Table 2. Frequently distribution of overall satisfaction with booking appointment services

Satisfaction with information	Number	Percentage%
Satisfied	36	9.4
Relatively satisfied	235	61.2
Dissatisfied	113	29.4

Table 3. Distribution of general satisfaction, ease of the process of booking appointment and re-appointment in case of oral disease separately by the method of booking

	Variety	Online		Via telephone		Queuing		P-value
		Number	Percentage%	Number	Percentage	Number	Percentage	
Overall satisfaction of the booking system	Satisfied	15	13	5	4.9	12	2/7	003/0
	Relatively satisfied	85	74	71	69.6	108	7/64	
	Dissatisfied	15	13	26	25.5	47	1/28	
Convenience of the booking process	Very easy	4	3.6	3	2.9	10	6	15/0
	Relatively easy	25	22.5	15	14.7	27	2/16	
	Normal	46	41.4	40	39.2	61	5/36	
	Not so easy	26	23.4	31	30.4	37	2/22	
	Not easy	10	9	13	12.7	32	2/19	
Tendency to reappointment if you have oral disease	Yes	28	24.3	18	17.6	30	18	32/0
	Perhaps	44	38.3	49	48	73	7/43	
	Not able to decide yet	35	30.4	26	25.5	47	1/28	
	No	8	7	9	8.9	17	2/10	

Table 4. The average score of the patient's satisfaction with the behavior of staff and satisfaction with the waiting time (from 100)

Patients' satisfaction	Average	Standard deviation	Minimum	Maximum
With the behavior of the staff	49.6	23.1	0	100
With the waiting time	44.7	24.1	0	100

Table 5. Frequent distribution of reasons for not using the telephone booking system

Reasons for not using the telephone appointment system	Number	Percentage %
not comfortable	100	28.3
Busy signal	164	46.5
Lack of knowledge of how to use	44	12.5
Don't know the section to book appointment	45	12.7

Table 6. Average score of patients' satisfaction on behavior of staff and satisfaction with waiting time by patient location

Score	Isfahan natives		Non-native		Passenger		P
	Average	Standard deviation	Average	Standard deviation	Score	Standard deviation	
satisfaction with the behavior of staff	51.3	23.8	45.3	22.3	45.6	14.8	0.03
satisfaction with waiting time	46.8	24.3	38.4	23.5	42.6	21.4	0.01

Figures

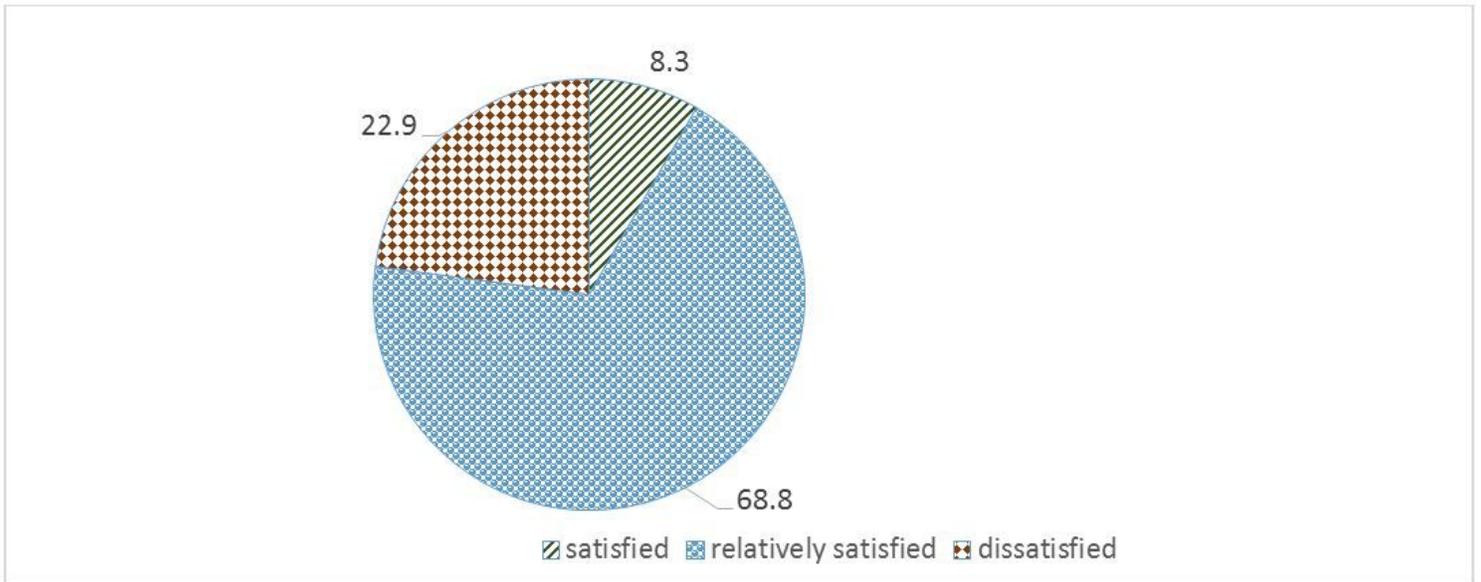


Figure 1

Percentage of frequency distribution of overall satisfaction with booking appointment services.

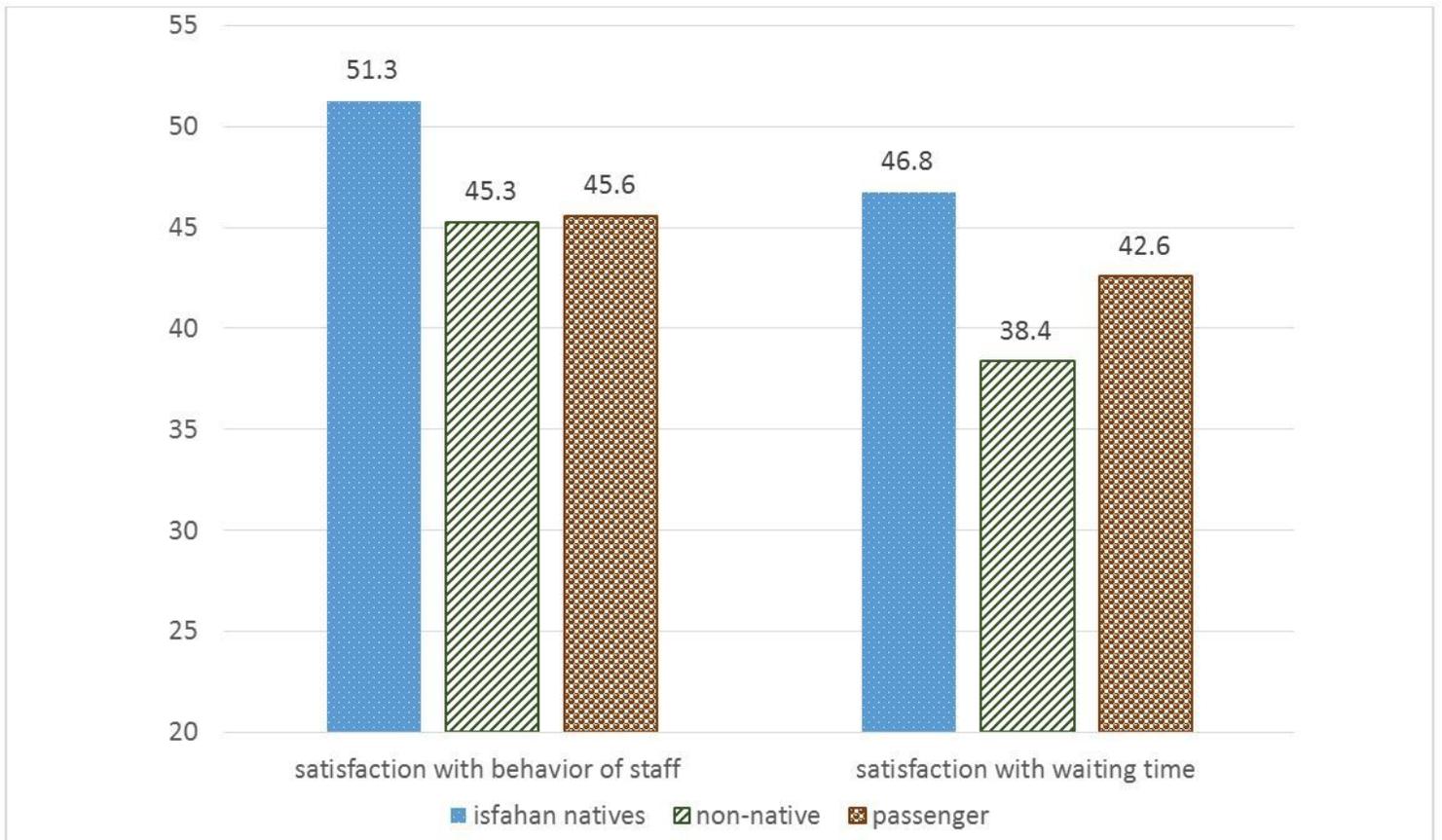


Figure 2

Average patient satisfaction scores on behavior of staff and satisfaction with waiting time by patient location.

Supplementary Files

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- [Graphs.docx](#)