Investigating the Quality of Waiting Time and Visits of Patients Referring to Comprehensive Health Centers using the Structure, Process, and Outcome Standards: A Case Study of Northeast Iran, 2022

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ABSTRACT

Introduction:
Patients' satisfaction levels are influenced by how well their expectations are met and the success of their treatment. Both patient satisfaction and successful treatment are critical components of healthcare quality. This study aimed to investigate the quality of waiting times and consultations for patients visiting comprehensive health centers in Northeast Iran, utilizing structure, process, and outcome standards.

Materials and Methods:
This study was conducted in two phases. The quantitative phase involved 429 patients visiting comprehensive health centers in Mashhad from May to August 2022. Data was collected through a three-part questionnaire assessing structure, process, and outcome standards and analyzed using SPSS version 24. In the qualitative phase, using purposive sampling and semi-structured interviews, factors influencing waiting times and consultation durations based on physicians' perspectives were examined. The qualitative data analysis was performed using MAXQDA version 20.

Results:
The quality of visits at comprehensive health centers in Mashhad was favorable, with structure scores at 15.09 (SD = 1.71) and process scores at 5.9 (SD = 0.95), indicating medium quality. Physicians believe longer visits and reduced waiting times enhance prescriptions, patient satisfaction, and trust while decreasing errors and costs.

Conclusion:
The comparative analysis of the quality of waiting time and visit length using structural, process, and outcome standards in comprehensive health centers in Mashhad showed a desirable level of quality, which shows that the standards have been correctly established. However, due to the shorter visit length, it is recommended that standards be implemented to increase patient safety in terms of diagnosis accuracy.

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Introduction

Nowadays, healthcare provision has received much attention due to its significant contribution to a country's economy. So, the health system of any society is considered a complex, vital, and extensive system on which people's health depends (1). According to the World Health Organization (WHO), health systems' major goals include responding to people's needs and expectations, providing suitable health, and reducing related costs (2). People's satisfaction levels depend on the extent to which their expectations are met and the success of their treatment (3). Patient satisfaction and successful treatment are among the main factors of health care quality (4). Healthcare quality is defined as the degree to which health services provided to individuals and communities increase the probability of desired outcomes and are consistent with current professional knowledge. Avedis Donabedian is rightly recognized as the pioneer in categorizing healthcare quality standards into structure, process, and outcome. The Donabedian model was developed to evaluate the quality of care using the following measures. The structure includes the physical aspects of health care, such as equipment and resources. Process refers to what is done for patients, such as clinical examinations and prescriptions. The outcome includes changes in health status due to healthcare, such as outpatient satisfaction with visit length (5).

As in other services provided in a health system, in outpatient visits in private and public clinics, some factors determine the quality of care. One of these factors is visit length, the total time a patient spends from arrival in the examination room until leaving it (6,7).

In other words, visit length is one of the major determinants of a doctor's accurate and correct diagnosis and has a decisive role in improving disease. Additionally, a high-quality visit improves patients' health and increases their satisfaction. Patient satisfaction and successful treatment are considered fundamental factors influencing the quality of care. These factors can also reduce the need for further appointments (8-12).

On the other hand, patient dissatisfaction with health services leads to unfavorable outcomes. Patient dissatisfaction causes reluctance to return to health centers, lack of contribution to improving health services, and disconnection from the health system (13). It can also lead to feelings of incompetence, helplessness, and frustration among the health staff and, eventually, a decrease in the efficiency of the health system.

Accordingly, dissatisfaction among patients referring to health centers shows that the health system has acted against its raison d'être and responsibilities to address people's healthcare needs and maintain and improve their health (14).

The Ministry of Health and Medical Education (MOHME) has recommended that a standard visit last about 10 minutes for general practitioners and 15 minutes for specialists (7). How physicians and patients communicate is an important factor in evaluating the quality of outpatient visits and is the most significant determining factor of outpatient care quality.

Outpatient visits are normally the starting point of the treatment process, and the continuation of treatment depends on the decisions made during the initial visits. Therefore, the quality of outpatient visits and improvement of the factors affecting them, such as standard visit length, are necessary for physicians' accurate diagnosis and play a decisive role in improving illnesses and reducing the need for further appointments. The extensive search showed that previous studies mainly focused on specialized outpatient centers or clinics, whereas the present study assessed the quality of outpatient visits in terms of structure, process, and outcome standards in comprehensive health centers in Mashad in 2022. The research team attempted to answer the following questions to determine the quality.

1. The level of structure, process, and outcome standards showing the quality of outpatient visits in comprehensive health centers in Mashhad in 2022.

2. What are the physicians' opinions regarding the structure, process, and outcome standards for measuring the quality of patients' waiting time and visits in comprehensive health centers in Mashhad in 2022?

Methods and Materials

This research was a mixed-methods study consisting of a quantitative and a qualitative part conducted in comprehensive health centers. It assessed the quality of waiting time and visit length using the structure, process, and outcome standards in Mashhad City between May and August 2022.

The Quantitative Part

The study population included all the patients referred to the comprehensive health centers in Mashhad city. The sample was determined to be 429 people using the Cochran formula. Data was collected by the research team visiting the comprehensive health centers. The required information was collected using the questionnaire introduced by Hasanpour et al. (9), consisting of a structural, process, and outcome quality questionnaire in two shifts (morning and afternoon), considering the outpatient referral rate.

Research Tools:

The tool used was a questionnaire introduced by Hasanpour et al. (9), consisting of Yes/No questions. The research team completed questions by interviewing the patients. The questionnaire consisted of a structural quality standards part (6 questions), a process quality standards part (18 questions), and an outcome quality part (1 question).

The face validity of the tool was confirmed in a study conducted by Hasanpour et al. (9). Content validity can be measured using the content validity ratio (CVR) and content validity index (CVI). CVR checks the necessity of questions, and CVI determines the questions' simplicity, relevance, and clarity (15). This analysis indicated that the CVR and CVI were higher than 73% and 81% for all the questions, respectively. Moreover, the reliability of parallel forms was used to check the reliability of the questionnaire. In this method, two forms containing some test questions related to a subject were given to a similar group. In other words, two equivalent tests on a specific subject are prepared and given to a group with a short interval between them. The correlation coefficient of the scores before and after was 0.98. The CI of 0.85-0.99 shows the reliability of our tool (29,30).

SPSS24 was used to analyze the quantitative data. The patients' and physicians' demographic information was reported using descriptive statistics (Frequency and percentage) and (Mean and standard deviation).

The Qualitative Part

The research population comprised 26 physicians working in comprehensive health centers, selected through purposive sampling. Interviews were conducted using a snowball sampling approach. First, a checklist was used to record their demographic information, including age, gender, specialty, marital status, and work shift. Afterward, adjusted questions were used in the semi-structured interviews, and other questions were used according to the participants' responses. In other words, an interview guide was prepared, and the researchers assessed the physicians' view of the quality of visit length and waiting time using the structural, process, and outcome standards. The interviews continued until data saturation was achieved.

A summary of the interviews was provided to the interviewees after each session to ensure the validity of the data. To maintain objectivity, two researchers coded the data simultaneously, and the codes and subcodes were subsequently compared. The conventional content analysis method was employed for coding (16). Furthermore, to enhance the reliability of the data, all codes and subcodes resulting from the analyses were evaluated and compared by the research team. The four criteria introduced by Lincoln and Guba—validity, reliability, confirmability, and transferability—were also utilized to assess reliability (17). The interviews were conducted from July to September 2022, and analysis and coding were performed using MAXQDA20.

Results

The Quantitative Part:

The study population comprised 42% males and 58% females. The mean age was 40 ± 14.5 years. Regarding marital status, 21% of patients were married or separated, while 79% were single. Educationally, 26.5% of patients were either illiterate or did not possess a high school diploma, 39.9% held a high school diploma, 23% had either an Associate's or Bachelor's degree and 10.6% attained either a Master's degree or a doctorate. Regarding occupation, 17.1% of

patients were government employees, 25.7% were self-employed, 44% were homemakers, 5.8% were university students, and 7.5% were retired, as detailed in Table 1.

Table 1: Demographic information of the patients referring to comprehensive health centers

Variable		Frequency (%)
Sex	Male	180 (42)
	Female	249 (58)
Marital status	Single	338 (79)
	Married/separated	81 (21)
Level of Education	Illiterate or without a high school diploma	73 (26.5)
	High School Diploma	170 (39.9)
	Associate or Bachelor's	98 (23)
	Master's degree or doctorate	37 (10.6)
Occupation	Government employee	71 (17.1)
	Self-employed	107 (25.7)
	Homemaker	183 (44)
	University student	24 (5.8)
	Retired	31 (7.5)
Income (monthly)	Less than 660 thousand tomans	64 (16.2)
	660 thousand tomans–one million five hundred thousand tomans	25 (6.3)
	One million five hundred tomans–two million five hundred thousand tomans	55 (14)
	More than two million five hundred thousand tomans	250 (63.5)
Number of Visits	Once	240 (63.8)
	Twice	55 (14.6)
	Three Times	30 (7.9)
	Four Times	8 (2.1)
	Five Times	19 (5)
	Six Times	10 (2.6)
	Seven Times or More	14 (3.7)

According to the findings presented in Table 2, the mean waiting time prior to admission was 8.95 ± 13.86 minutes. The mean waiting time for a physician visit was 13.8 ± 19 minutes. Additionally, the average duration of the visit was 6.3 ± 4.6 minutes.

Table 2: Mean, standard deviation, maximum, and minimum of the variables measured in the study

Variable (Minute)	Mean	Standard Deviation	Maximum	Minimum
Waiting time to admission	8.95	13.86	120	0
Waiting time for visit	13.8	19	120	0
Visit length	6.3	4.6	65	0.5

Table 2 shows the quality of physicians' visits using the structure, process, and outcome standards in comprehensive health centers of Mashhad City in 2022. Scores closer to 100 show better quality. The results indicated that the mean of the structure, process, and outcome standards, which showed the quality of visits, were 87.93 ± 11.83, 85.39 ± 12.16, and 74.92 ± 9.15, respectively, which shows an acceptable rate.

Table 3: The rate of the structure, process, and outcome standards showing the quality of visits in comprehensive health centers

Variable	Type of Standards	Mean	Standard Deviation	Maximum	Minimum
Quality	Structure	87.93	11.83	90	55.88
	Process	85.39	12.16	88	64.71
	Outcome	74.92	9.15	84	62.75
	Total	78	18.65	84	65

The Qualitative Part:

The physician cohort consisted of 46% males and 54% females. The mean age of the participating physicians was 48 ± 6.95 years. Regarding marital status, 81% of physicians were married or separated, while 19% were single. Regarding specialty, 42% of physicians were general practitioners (GPs), and 58% were specialists. Finally, 69% of physicians worked morning shifts, whereas 31% worked evening shifts, as detailed in Table 4.

Table 1: Demographic Information of the Physicians (Participants in the Study)

Variable		Frequency (%)
Sex	Male	12 (46.15)
	Female	14 (53.85)
Marital status	Single	5 (19.23)
	Married/separated	21 (80.77)
Specialty	GP	11 (42.30)
	Specialist	15 (57.7)
Work Shift	Morning	18 (69.23)
	Evening	8 (30.77)

The findings included a main theme, the standard visit, and three sub-themes, including the reasons for non-compliance with standards, the effects of increasing visit length, and factors and conditions affecting the standard visit. Each of these sub-components was divided into some sub-categories (Table 5).

Table 5: Factors affecting the structure, process, and outcome standards showing the quality of outpatient visits from the point of view of physicians

Theme	Sub-theme	codes
Standard Visit	The reasons for non-compliance with standards	Low doctor-patient ratio
		Lack of cultural promotion
		Lack of amenities
		Low doctor's visit costs
		Lack of Personnel
		Large Number of Patients
		Slow internet connection
		New regulations for drug registration in the prescription system
		Completing several forms for patients
		Lack of an efficient appointment system
		Variety of care services
		Lack of standard equipment for examination
		Lack of support from officials
		Non-compliance with guidelines
	The effects of increasing visit length	Increased quality of prescriptions
		Increased patient satisfaction
		Less patient anxiety
		Increased quality-of-service delivery
		Higher efficiency of the treatment process
		Improved patients' trust in physicians
		Better opportunity for patients to talk about their problems
		Better medical advice
		Reduction in doctor's fatigue
		Decreased medical errors
		Reduced costs and medicine waste
		Increase in patients' relaxation
		Increased patient satisfaction
		Decreased need for further visits
	Factors and conditions affecting the standard visit	Regular appointments (by phone or online)
		Personnel training and culture promotion
		Proper triage
		Appropriate doctor-patient ratio
		Fast internet speed
		Eliminating the financial relationship between doctor and patient
		Efficient implementation of the Family Physician Program
		Convenient amenities
		Waiting room safety
		Activating the referral system
		Guiding patients with special diseases
		Personnel teamwork
		Increasing the number of health centers
		Increasing people's awareness
		Improving the health literacy of the public
		Providing proper health infrastructure
		Implementing instructions

Standard Visit

1. The reasons for non-compliance with standards

Non-adherence to standards regarding patient visits will lead to crowded waiting rooms and decreased quality of service delivery. Therefore, there is a need to periodically train physicians about the existing standards and increase their awareness. In this regard, participants stated that "physicians should be periodically trained by the managers of the centers on the required standards of visits so that they can work efficiently enough to improve visit length. Not complying with these principles can be due to a lack of standard equipment for examination, large number of patients, physicians' lack of awareness, lack of training courses on the standards, and lack of an efficient appointment system."

2. The effects of increasing visit length

One factor significantly contributing to a treatment process's success is visit length. Short visit lengths usually lead to adverse outcomes for patients, specifically those with chronic illnesses such as high blood pressure, diabetes, and cancer.

If physicians do not allocate enough time to examining patients, they ignore patients' psychological problems, take incomplete patient histories, and do not recommend enough prevention measures to their patients. As a result, they will lose their patients' satisfaction and trust due to their incorrect diagnosis. Overall, short visit length causes the quality of the provided treatment service to decline and impose heavy costs on the country's health budget. According to one of the physicians who participated in this study, "increasing visit length will improve diagnosis, reduce costs, increase patient satisfaction, and increase patients' trust in physicians; therefore, enough time should be spent on examining patients."

3. Factors and conditions affecting the standard visit

Patient satisfaction is one of the most important indicators in evaluating the quality of service- delivery, and evaluating the level of satisfaction with different departments of a hospital can play a significant role in improving the quality of services. As mentioned earlier, visit length remarkably impacts patient satisfaction; consequently,

factors and conditions influencing a standard visit should be accurately determined and used to improve satisfaction. According to another doctor who participated in the study, "Physicians' adherence to the standard visit length has an important role in diagnosis and treatment while reducing the need for further visits. Furthermore, paying more attention to the continuous development of this process and more monitoring are recommended to achieve the goals of the standard visit."

Discussion

A standard visit length is necessary for an accurate diagnosis of diseases and plays a determining role in developing a treatment process and reducing the need for further visits. Fewer visits reduce patients' direct and indirect costs and prevent additional overhead costs. On the other hand, more visits lead to long waiting lines in outpatient clinics, a significant increase in waiting time, and, ultimately, a decrease in patient satisfaction levels. Therefore, the present study aimed to assess the quality of outpatient visits using the structure, process, and outcome standards in comprehensive health centers in Mashad City in 2022.

The results of the present study indicated that from the point of view of patients, the quality of patient visits in the comprehensive health centers was favorable in terms of structure, process, and outcome standards. The mean score of outpatient visit quality was 87.93 (SD=11.83) for structure standards, 85.39 (SD=12.16) for process standards, and 74.92 (SD=9.15) for outcome standards, respectively, which indicated an acceptable rate. The study conducted by Hasanpour et al. showed that the quality was 50.82%, 62.69%, and 50.82% for structure, process, and outcome standards, respectively. In their study, shorter specialist and subspecialist visit lengths compared to the standard were due to the large number of patients and the physicians' eagerness to make more money, making them see more patients in a shorter time.

The waiting time was unsatisfactory, due to issues in scheduling appointments at a specific time, the large number of patients, and physicians' lack of punctuality. Moreover, the structure, process, and outcome quality

standards for visits were less than 65%, which aligns with our results (9).

A study by Nikpour and Majlesi revealed that the overall patient satisfaction rate was 72%, which showed an acceptable level (5). In another study by Heydari and Seyedi in Qom, the patient satisfaction rate was reported to be 88%, which was in line with the results of the present study (18).

Another study conducted by Barikani and Kafashi indicated that from the point of view of patients, the quality level of outpatient services was 48%, which was lower than our rates. Therefore, creating an efficient system for recording and reporting errors and minimizing barriers to quality improvement may increase quality levels. In Barikani and Kafashi's study, satisfaction rates varied from 38% to 96%. The highest percentage of satisfaction was related to the family health unit, and the lowest was related to access to services (19). The results of the study by Ramezanpour aimed to investigate the degrees of quality standards in teaching hospitals affiliated with Golestan University of Medical Sciences indicated that the quality of outpatient services was at a desirable level and that there was no significant difference between the selected centers. This study was in line with the results of the present study (20). Moreover, the study by Janati et al. aiming to investigate the quality assessment of doctor's visits in Tabriz showed that shorter specialist and subspecialist visit lengths compared to the standard was due to the large number of patients as well as physicians' eagerness to make more money, making them see more patients in shorter time. Patient waiting time was unacceptable because of issues in scheduling appointments at a specific time, the large number of patients, and physicians' lack of punctuality. Moreover, the overall quality rate of the visits using the structure, process, and outcome standards was estimated to be less than 65% (21). At the same time, our results showed that according to physicians, increasing visit lengths and reducing waiting time can lead to an increase in the quality of prescriptions and patient satisfaction, less patient anxiety, an increase in the quality-of-service delivery, higher efficiency of the treatment process, an improvement in patients' trust in physicians, and providing a better opportunity for patients to talk about their problems. Other benefits of this measure from the physicians' point of view were more accurate diagnosis, better medical advice, reduction in physicians' fatigue, decreased medical errors, reduced costs and medicine waste, improved communication with patients, and increased patient relaxation.

Patients are the judges of service quality. As the first line of health care provision, general practitioners provide medical services to many patients. Assessing patient satisfaction can identify the factors affecting service quality and may be used to alleviate weaknesses and improve the strengths of healthcare service quality at a large scale.

In the study of Nguyen et al. in Vietnam, the mean total waiting time was 104.1 minutes. Old age, visiting internal medicine departments, early registration time, undergoing tests, and the day of the week affected the total waiting time in outpatient clinics, which was in line with our results (22). Furthermore, Oche et al. argued that the long waiting time in their study was due to the large number of patients and insufficient staff to meet the patient's needs (23).

The study done by Croft et al. on military hospitals in the UK showed that waiting time is a crude but easily measurable indicator, which reflects the availability of services in these centers. Regarding patient care, the key to achieving a long-term reduction in waiting time is adequate staffing and efficient management of clinics, which also complies with our findings (24).

Limitations

The study's limitation was physicians' and patients' limited time to complete the questionnaires. The researchers resolved the problem by making prior arrangements with centers officials to visit during convenient office hours. Considering the patients' physical and mental condition, the researcher fully explained the research objectives to the participants before completing the questionnaire to establish better cooperation.

Conclusion

The comparative analysis of structural, process, and outcome standards measuring the quality of waiting time and visit length in comprehensive health centers in Mashhad in

2022 showed a desirable quality level, proving that standards have been correctly established. However, due to the short length of visits, it is recommended that standards regarding patient safety be implemented for a more accurate diagnosis. Standard visit lengths are necessary for physicians' accurate diagnosis and play a decisive role in improving illnesses and reducing the need for further appointments. Fewer visits reduce patients' direct and indirect costs and prevent additional overhead costs. On the other hand, more visits lead to long waiting lines, a significant increase in waiting time, and, consequently, a decrease in patient satisfaction levels in outpatient clinics. The starting point of providing medical services to patients is visiting them. Suppose this initial point of providing medical services is inaccurate or incomplete. In that case, the subsequent processes, including the treatment of the patients, their care, and all the clinical work done for the patients, will lack quality and even lack safety. Patient satisfaction is one of the most important indicators in evaluating the quality-of-service delivery, and evaluating the level of satisfaction can play an influential role in improving the quality of services. Moreover, insufficient visit length leads to an increase in patients' prescription and injection drugs as well as a rise in physicians' demand for diagnostic and therapeutic services such as tests, CT scans, MRI, and other expensive services.

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