Website: http: jebhpme.ssu.ac.ir
EBHPME 2023; 7(4): 257-66
EISSN: 2538-4716

Evidence Based Health Policy, Management & Economics

ORIGINAL ARTICLE

Measuring and Comparing Service Delivery Time in Government and Outsourced Health Posts Affiliated with Tehran University of Medical Sciences

Seyed Hadi Hosseini [1]*, Mitra Rahimzadeh [2], Ali Hosseini [3], Arash Shirdel [4], Seyedeh Sedreh Hosseini [5], Mohammad Amerzadeh [6]

[1] Department of Healthcare Services Management, School of Health, Alborz University of Medical Sciences, Karaj, Iran
[2] Department of Epidemiology and Biostatistics, Social Determinants of Health Research Center, School of Health, Alborz University of Medical Sciences, Karaj, Iran
[3] Student Research Committee, School of Dentistry, Alborz University of Medical Sciences, Karaj, Iran
[4] Department of Health Information Technology, Ferdows Faculty of Medical Sciences, Birjand University of Medical Sciences, Birjand, Iran
[5] Department of Exceptional Student Education, General Department of Education of Alborz Province, Karaj, Iran
[6] Social Determinants of Health Research Center, Research Institute for Prevention of Non-Communicable Diseases, Qazvin University of Medical Sciences, Qazvin, Iran

A B S T R A C T

Background: The duration of healthcare services has a significant impact on the quality of care and patient's satisfaction. Having information on service delivery time in both government and outsourced Health Posts (HPs) can contribute to evidence-based policymaking and better resource management. Therefore, this study aims to estimate and compare service delivery time in government and outsourced HPs.

Methods: This descriptive-analytical cross-sectional study was conducted in six affiliated HPs under Tehran University of Medical Sciences in 2019–2020. Data were collected through a census using a stopwatch and a time recording form during one working week. The average duration of each service (in minutes) was obtained. The results were reported using descriptive statistics and were analyzed using $SPSS_{24}$ software and multivariate analysis of variance (ANOVA).

Results: The total mean of duration of services provided in government HPs (777.6 minutes) was greater than that in outsourced HPs (788.5 minutes). Among the 10 services provided, the average duration of services for adolescents (20.4±4.5 minutes), young adults (20.5±5.6 minutes), middle-aged adults (26.1±10.4 minutes), and elderly individuals (24.3±13.6 minutes) in government HPs was significantly longer than in outsourced HPs ($p<0.05$). Additionally, the average duration of health education services (23.1±10.5 minutes) and health ambassador training (36.1±13.7 minutes) in private HPs was significantly longer than in government HPs ($p<0.05$).

Conclusion: In outsourced HPs, it is important to focus on creating a balance between the number of visits and the staff available for services which target adolescents, young adults, middle-aged adults, and elderly individuals. In government HPs, emphasis should be placed on increasing the time allocated for educational and promotional health services. By considering the importance of service delivery time and the observed differences in findings of this study, it is crucial to prioritize the duration of service delivery as an important performance measure when comparing government and outsourced HPs.

Keywords: Primary Healthcare, Duration, Government Health Post, Outsourced Health Post, Tehran.

Introduction

Primary healthcare (PHC) can be considered the optimal approach to ensuring and providing healthcare for everybody. It is the most efficient means of achieving and improving the level of health within any given community. Neglecting primary healthcare services and low-quality

Corresponding Author: Seyed Hadi Hosseini
Email: hadihosseini@live.com
Tel: +98 9128786844
Department of Healthcare Services Management, School of Health, Alborz University of Medical Sciences, Karaj, Iran

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[DOI: 10.18502/jebhpme.v7i4.15476]

healthcare can lead to an increase in various diseases and mortality rates in any community, resulting in significant economic damage (1).

In Iran, PHC is defined as an integral component of health network, and PHC Network was established during the 1980s (2). In the development plan of Iran's healthcare system, two types of operational environmental units were established to provide PHC: Health Houses (HHs) in rural areas and Health Posts (HPs) in urban areas, both supervised by Community Health Center (CHC) in rural or urban settings (3). Urban and suburban residents primarily seek healthcare services from the HPs, which are staffed by health providers (4). On average, these HPs serve around 12,500 individuals (ranging from 5,000 to 20,000 individuals and up to 25,000 individuals in major cities), and for every 2,000 to 2,500 individuals, one health provider should be employed. The types and quantity of services provided at HPs are defined based on age-specific service packages outlined by the Ministry of Health and Medical Education (MoHME) in the Integrated Health System (SIB); they include child care (from birth to 4: height, weight, vaccination), adolescent care (5 to 17), youth care (18 to 29), middle-aged care (30 to 59), elderly care (60 and above), women and maternal care (pre-pregnancy, during pregnancy, postpartum), public health education, school health, training and education of health ambassadors, and disease prevention (5).

During the formation of health network structure in Iran, HPs were managed by the government. The government was the owner of the facilities and equipment, and service providers were employed by the government. However, over the past two decades, due to various challenges in establishing government-operated healthcare units in cities, including financial constraints, human resource shortages, and the required equipment (6, 7), a new approach was adopted to establish outsourced HPs.

Therefore, with an emphasis on the second phase of the Health Transformation Plan (HTP) and the utilization of the Urban Healthcare Network Development Plan (UHNDP), a legal framework was established to expand the network in cities, especially in suburban areas. Outsourced health bases were to reduce government and MoHME's burden (7), utilize the capacity of non-governmental sectors, achieve quantitative and qualitative development of services, and improve resource management (8). Currently, both government-operated and outsourced health bases are active, and medical universities and healthcare institutions play a supervisory role in their operations.

Outsourcing is one of the economic methods and tools for delegating services outside the organization to increase efficiency (9). In a study by Ahmadizadeh et al. (10), outsourcing in healthcare sector was effective in improving service quality, patient satisfaction, and organizational efficiency. Outsourced HPs are designed in accordance with the standards of the healthcare network in terms of type and number of services, population coverage, human resources, physical space, and equipment, similar to government-operated health bases. In both government-operated and outsourced bases, all services are provided free of charge to the patients, and there is no payment required from them (5).

Timing healthcare services is recognized as an initial step in determining the time spent on services. This action is considered a determining factor in prioritizing health service packages and standardizing processes, and is essential for improving efficiency and quality (11). The calculated time durations can be used for generating policy evidence, better resource management, program and budget planning, and prioritizing services (12). In healthcare service delivery systems, usually at the beginning of program implementation and service packages, the time for each service is thoroughly examined and taken into account. However, other packages added to the service delivery network several years later or after relevant reforms are often integrated without time studies. According to Westbrook et al. (13), lack of timing healthcare services and decision-making in the absence of timing information can result in resource waste and the quality of service provision would be influenced by workload and time spent by staff.

Tehran University of Medical Sciences (TUMS), as

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[DOI: 10.18502/jebhpme.v7i4.15476]

part of its defined responsibilities, provides PHC services to urban population through HPs located in the southern regions of Tehran City, as well as in the cities of Rey and Islamshahr. These areas face challenges such as social vulnerabilities, population growth and density, marginalized internal migrants, foreign populations, and seasonal workers (14). They also experience population changes and inadequate access to healthcare facilities (15). Therefore, paying attention to healthcare service provider units in these areas is of significant importance.

Currently, despite the significant need for access to relevant evidence regarding the duration of healthcare services provided by HPs, except for a few time studies conducted on the processes of HHs (16, 17), no specialized studies have been observed in the environment of HPs. Additionally, no study was found regarding the comparison of service durations between governmental and outsourced HPs. Besides, after several years of operation of these bases and considering the changes implemented in their management, there is a need for timing healthcare services to describe the current conditions. Comparing the duration of service provision can effectively highlight the differences as well and serve as a valuable guide for policymakers. Therefore, this study was conducted to estimate and compare the duration of services provided by governmental and outsourced HPs affiliated with TUMS.

Materials and Methods

This research was conducted using a cross-sectional descriptive-analytical method in six HPs under the supervision of TUMS in 2019–2020. HPs are divided into attached (located inside or adjacent to CHCs) and unattached (located within an accessible distance from the center) based on their location (4). To reduce confounding factors' impact, and with a peer-unit standardization approach, this study focused on HPs selected from the attached HPs. Approximately, 20% of the attached HPs were included in the study sample size. Due to the dispersion of HPs in three geographical regions, including South Tehran, Rey County, and Islamshahr County, and the need to consider the distinctions of these regions as well as the type of their management, sampling of HPs was conducted in a multi-stage manner: clustering (in the three regions mentioned), stratification (governmental and outsourced), and random selection (from the available list). The study units were selected from the South Tehran Health Center (one governmental HP, one outsourced HP), Rey Health Network (one governmental HP, one outsourced HP), and Islamshahr Health Network (one governmental HP, one outsourced HP).

The three HPs were managed as governmental facilities, while the other three bases were outsourced. Considering that the outsourced HPs were transferred to the private sector, from now on, the term "private HPs" will be used to refer to the outsourced HPs.

In order to collect data, visits were made to HPs, and the objectives of the study were explained to the healthcare providers. Initial information was obtained by collecting data form which included three questions: 1) type of HP (governmental or outsourced); 2) number of healthcare providers; and 3) the types of services provided. Furthermore, using a stopwatch and a time recording form, entry rate of visitors, average daily visits, and duration of specific services were recorded for each HP over a working week, with regard to busy days (Saturdays), moderately busy days (Tuesdays), and quiet days (Thursdays). The sampling of HPs was conducted through a census on the mentioned days.

To calculate the mean of service provision duration, relevant service durations were recorded in 10 different time slots, and then, the respective service means were obtained. Regarding "school health" service, the average service time was derived from the overall average time of healthcare providers' visits to schools (for examinations, conducting sessions, and providing education) and the service time during students' visits to HPs.

The collected information was reported in the form of descriptive statistics and analyzed using the $SPSS_{24}$ software through nested multivariate

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[DOI: 10.18502/jebhpme.v7i4.15476]

analysis of variance (MANOVA).

Results

Services provided in the HPs were similar and were categorized into 10 groups as follows:

1. Childcare: providing care for infants and children from birth to 4, with a focus on height and weight' monitoring and vaccination
2. Adolescent care: individuals aged 5 to 17
3. Youth care: targeting individuals aged 18 to 29
4. Middle-aged care: addressing the needs of individuals aged 30 to 59.
5. Elderly care: catering to individuals aged 60 and above, with further categorization of 60 to 70 ,and 70 and above
6. Women's care: including pre-pregnancy, during pregnancy, and post-delivery care
7. Public health education: providing public health education to the community
8. School health: offering health services and education within schools
9. Health ambassador training and education: training individuals as health ambassadors.
10. Disease prevention and control: focusing on controlling diseases

Additionally, Table 1 presents the information regarding the number of staff, average daily visits, standard deviation of daily visits, and the entry rate of visitors.

Table 1. The number of employees, average and standard deviation of daily visits, and rate of patient entry to HPs

HPs	Number of healthcare providers	Mean and standard deviation of daily visits	Number of visits per healthcare provider	Rate of patient entry in minutes
Government 1	4	16.6±1.69	4.5	4.20
Government 2	2	49.3±3.6	24.5	8.9
Government 3	2	25.3±2	12.5	20
Private 1	5	10.5±11.5	20.6	1.4
Private 2	4	75±8.1	18.7	6.5
Private 3	3	64.3±5.7	21	7.6

In the following, the average and standard deviation of service duration in each HP were obtained based on service and HP type. A comparison of average service duration in government and private HPs indicated that the durations for services related to infants and children (24 ± 12.2), adolescents (20.5 ± 4.8), youth (20.5 ± 5.6), middle-aged individuals (26.6 ± 10.4), and elderly individuals (24.3 ± 13.6) were higher in government bases. On the other hand, services for women (25.1 ± 9.4), health education (23.5 ± 10.1), school health (77.7 ± 61.3), health ambassador training (36.1 ± 13.7), and disease prevention (13 ± 6.9) were higher in private HPs. As shown in Table 2, the longest durations for providing services to infants and children, adolescents, youth, middle-aged individuals, the elderly, women, health education, school health, health ambassadors, and diseases were observed in the following order: government HP 1 (30.8 ± 13.7), government HP 3 (24.4 ± 7), government HP 3 (25.1 ± 6.9), government HP 3 (38.4 ± 4.8), government HP 1 (42.2 ± 7.9), government HP 1 (37.7 ± 11.9), private HP 2 (36.6 ± 4.7), private HP 3 (77.3 ± 73.4), private HP 2 (38.4 ± 9.8), and private HP 2 (15.3 ± 8). The shortest durations were observed in government HP 2 (15.8 ± 3), private HP 3 (12.4 ± 2.4), government HP 2 (16.4 ± 1.4), government HP 2 (15 ± 3.7), private HP 1 (13.7 ± 4.7), government HP 2 (11.9 ± 3.9), private HP 1 (15.9 ± 2), government HP 3 (57.3 ± 33.7), government HP 3 (25.7 ± 16), and private HP 3 (9.9 ± 3.4).

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Table 2. The mean and standard deviation of service delivery times (in minutes) and significant coefficients of the mean differences

Services / HPs	Children	Adolescents	Young adults	Middle-aged adults	The elderly	Women	Health education	School health	Health ambassadors	Diseases	Overall mean of the HPs.
Government 1	30.8±13.7	19.2±1.4	18.7±5.9	24.1±2.6	42.7±2.9	37.7±11.9	21.1±3.5	67±52.4	30.2±15.9	13.2±7.6	30.4±11.8
Government 2	15.8±3	15.3±1.4	16.4±1.4	15±3.7	16.4±3	11.9±3.9	18.4±2.4	59±44.5	28.5±13.6	13.4±4.1	21±8.1
Government 3	24±9.1	24.7±4	25.6±1.9	38.4±4.8	13.8±3.2	25±11.8	18±2.4	57.3±33.7	25.7±16	10.3±3.3	26.2±9
Private 1	20.8±10.3	15±3.7	18.4±2.9	24.7±5.4	13.7±4.7	22.3±10.1	15.9±2	68±51.6	33.1±15.6	13.8±6.8	24.5±11.3
Private 2	21.1±6.3	18.9±1	17.9±1.3	21.5±5.3	20.4±4.9	26.5±10	36.3±4.7	65.3±49.2	38.4±9.8	15.3±8	28.1±10.1
Private 3	17±4.3	12.4±2.4	16.6±2.5	22.5±2.3	23.6±3.6	26.6±6.7	18±3.3	77.3±73.4	37±13.8	9.9±3.4	26±11.6
Overall mean by service category	21.8±10	19.9±4.3	19±4	24.7±7.6	21.7±9.9	24.9±12	21.6±6.9	70.4±53.2	32.1±14.6	12.6±6.2	26±10.3
Mean of government HPs	24v12.2	20.5±4.8	20.5±5.6	26.6±10.4	24.3±13.6	24.8±14.7	19.7±3.7	63.2±45.2	28.1±15.5	12.3±5.6	25.8±9.6
Mean of private HPs	19.6±7.8	15.4±3.8	17.6±2.5	22.9±4.9	19.2±6.2	25.1±9.4	23.5±10.1	77.7±61.3	36.1±13.7	13±6.9	26.2±11
Difference in means between government and private HPs	p>0.05	p<0.001	p<0.01	p<0.01	p<0.001	p>0.05	p<0.001	p>0.05	p<0.05	p>0.05	p>0.05
Difference in mean across all HPs without grouping	p<0.05	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p<0.001	p>0.05	p>0.05	p>0.05	p>0.05

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[DOI: 10.18502/jebhpme.v7i4.15476]

The analysis of observations revealed significant differences in average service duration of government and private HPs for services provided to adolescents ($p<0.001$), youth ($p<0.01$), middle-aged individuals ($p<0.01$), the elderly ($p<0.001$), health education ($p<0.001$), and health ambassador training ($p<0.05$). Additionally, significant differences were observed in average service durations for services provided to infants and children ($p<0.05$), adolescents ($p<0.001$), youth ($p<0.001$), middle-aged individuals ($p<0.001$), the elderly ($p<0.001$), pregnant women and mothers ($p<0.001$), and health education ($p<0.001$) in the studied HPs (without grouping) (Table 2).

Discussion

All HPs in this study were close to CHCs, and this allowed each of the six centers to attract patients who intended to receive services from the HP (8). However, the highest number of daily visits was recorded in private HPs, with the highest rate of patient influx observed in private HP 1 (one visit every 4.1 minutes), and the lowest rate of patient influx observed in government HP 3 (one visit every 20 minutes). Consequently, the total number and rate of patient influx were higher in private HPs, which could be attributed to the type of contractual agreement between HP contractors and the corresponding medical university. In these agreements, payments are based on the number of services provided and recorded in SIB, in such a way that an increase in the number of service recipients, and subsequently the number of services recorded in the mentioned system, results in higher remuneration (8). Additionally, greater control by the supervisors of private HPs over employed healthcare providers, who mainly operate through temporary employment contracts based on labor laws, can also be effective in monitoring, attracting, and providing more services to patients (18, 19).

These factors lead to greater and better coverage of the population and more active service provision, which has been significantly higher in outsourced HPs, compared to government HPs, according to the findings of the study by Salmani et al. (6).

Besides, in government HPs, healthcare providers are mainly engaged through official employment contracts and changes in the number of visits or the number of recorded services do not result in significant changes in income (20). This situation can lead to lower efficiency among government personnel and strengthen the motivation of policymakers to establish outsourced HPs (6, 7).

Furthermore, the majority of healthcare providers were employed in the following order: private HP 1, private HP 2, and government HP 1. Additionally, the highest number of patients per healthcare provider was observed in government HP 2, private HP 3, and private HP 1. Based on the available evidence, the workload should be proportional to the number of service providers so that health monitors can effectively manage service delivery situation. With an appropriate workload as one of the important criteria, more time can be allocated to provide respective services, leading to increased acceptability and satisfaction among patients (21).

The average duration of services provided in government and private HPs were 777.6 and 788.5 minutes, respectively, with a slightly longer duration in the private sector. However, the difference between them was not statistically significant. This situation indicates that active healthcare providers in both government and private sectors spend the amount of time providing services. Focusing solely on the total time spent cannot adequately demonstrate performance differences between the two sectors.

Furthermore, the comparison of government and private HPs regarding service delivery times showed that there were differences in service duration among the groups. These observed differences were expected as visits to these two types of facilities were different, which could be attributed to factors such as people's satisfaction with performance (20), facilities, behavior (6),

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[DOI: 10.18502/jebhpme.v7i4.15476]

and responsiveness (22) of these facilities. The possibility of time allocation changes with variations in the number of visitors. Additionally, findings from some studies indicate differences in the motivations of health supervisors and caregivers (20), which can be considered a factor contributing to variations in the time spent on service delivery. It has also been reported that the time spent on data recording and documentation (6) differs between these two types of facilities, which can affect the effective service delivery durations.

In this study, similar to the findings of Tabatabaei et al. (17), the highest average service delivery time was observed in school health services (with a focus on student education). The average service delivery time was higher than the values reported in the study by Parvareh et al. (16). Specifically, the average service delivery times for child services (12.1±5.53), elderly services (11.4±2.96), women's services (15.9±4.35), health education (13±2.23), and disease control (9.3±6.33) were higher. However , service delivery time for health promotion and education officers (similar to health ambassadors) (38.5±6.26) was higher than average in government HPs, but similar to private HPs. The comparison of the findings from these two studies indicated that healthcare providers in the current study spent more time on service delivery in all services except for the one mentioned. Health centers in rural areas are less crowded while the frequencies of visits are higher (23); therefore, the provision of relevant services can be accomplished in less amount of time due to repeated visits.

The findings indicated that the average service delivery time for adolescent, youth, middle-aged, and the elderly services in private HPs was significantly lower than those of government HPs. The high number of patients seeking health services and the mismatch between service providers (20), resulting in efforts to provide services more quickly and even skipping certain steps and stages of the service delivery process, can be among the reasons for shorter service delivery time (17). In situations where there are less visits, it is possible to provide services in a calmer environment, allow more time for patients, and reduce waiting time for receiving services. Consequently, patient satisfaction will increase (24).

Furthermore, according to the findings, the average service delivery time for health education and training health ambassadors in private health HPs was higher than in government HPs. Spending more time on these two services could be due to the increased efforts of outsourced HPs to promote health among service recipients and establish a cohesive and close relationship with them, simultaneously retaining current patients and attracting more individuals. These trainings in outsourced facilities can lead to increased satisfaction (20, 24).

Considering that the difference in average service delivery time for disease control between private and government HPs was practically negligible and not statistically significant, and the estimated time was very close to the standard time (14 minutes) for this service (16), it can be said that healthcare providers in both types of HPs have likely approached disease control in a non-discriminatory manner due to the high importance and sensitivity of disease prevention and control in the community and its significance in public health (17). Similar conditions and no significant difference between private and government HPs were observed in service delivery time for children, women, and school health services. The average service delivery time for the first two services in each type of facility was almost equal to the standard times (15, 25), and the third service exceeded the standard time (45 minutes) (16). This situation indicated the greater accuracy and sensitivity of healthcare providers in providing these services, likely due to their understanding (regardless of the facility type) of the pivotal role of each of these services in individual health and community health as a whole.

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[DOI: 10.18502/jebhpme.v7i4.15476]

Service delivery time in HPs, where healthcare providers had a higher workload, was generally shorter for most services. Therefore, it is recommended to increase the number of healthcare providers in these HPs in line with capacity and workforce optimization (25). It is suggested to assign higher importance for services targeting adolescents, youth, middle-aged, and the elderly in health system to motivate healthcare providers in private sector to attract and allocate more time for these groups. Moreover, it is proposed to conduct effective field visits by a designated representative from central administration in government facilities to emphasize allocating more time for providing educational services and collaborating with health ambassadors. Furthermore, it is recommended to introduce a competitive environment by establishing a statistics unit within the network of health administration to rank government HPs initially, and then outsource HPs. The number of active health ambassadors recruited and the frequency and duration of training sessions can be used as relevant indicators for this purpose.

Conclusion

In services where the time spent at outsourced HPs is shorter compared to government HPs, it is necessary to focus on creating a balance in the number of visits. In government HPs, emphasis should be placed on increasing the time allocated for educational services and health promotion. Considering the importance of service delivery time and the observed differences in the findings of this study, it is crucial to consider the duration of service delivery as an important performance measure when comparing government and private HPs.

Limitation

One of the main limitations of this study was the lack of relevant texts on the topic, which reduced the possibility of comprehensive and accurate comparisons regarding findings. Furthermore, during the participaton of patients for time measurement, there were occasional instances of resistance, which were generally resolved through explanations and justifications provided by the service provider and recipient.

Acknowledgments

The authors would like to express their gratitude to the officials of TUMS, as well as the supervisors and health caregivers of the studied HPs for their valuable support and cooperation throughout this study.

Authors' Contributions

Hosseini SH designed research; Hosseini SH and Rahimzadeh M, and Hosseini SS conducted research; Rahimzadeh M and Hosseini SH analyzed data; and Hosseini SH, Hosseini A, Shirdel A, Amerzadeh M wrote the paper. Hosseini SH had primary responsibility for final content. All authors read and approved the final manuscript.

Ethical Considerations

This study was conducted after obtaining the code of ethics from Tehran University of Medical Sciences (TUMS) and obtaining informed consent from all relevant participants.

Ethical Approval

The present study has been approved by the Ethics Committee of TUMS (code IR.TUMS.SPH.REC.1396.4209).

Conflict of interests

The authors declared no conflict of interests.

Funding

Non applicable.

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