



Timing of Motherhood and Reproductive Health Care Services in Suburban and Urban Texture Comprehensive Health Centers of Qom City

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Abstract

Background: The cost of working staffs covers almost one-third of all the expenses spent in women and motherhood healthcare services.

Objectives: The present study aimed at comparing the timing of motherhood and prenatal care healthcare services in comprehensive health centers after the implementation of health system reform plan.

Methods: Following an analytical cross-sectional research, 264 occurrences of motherhood health cares were studied, including 88 preconception cares, 88 prenatal cares, 88 postpartum cares, and 92 reproductive health care (356 person-services in total) in two urban texture and two suburban health posts in Qom city, during year 2018. Two chronometers were used to measure the timing of each of the healthcare components and healthcare services from the time the patient arrived to the end of the service. The timings were then enlisted in checklists. Descriptive statistics and independent samples *t*-test were used to analyze the data.

Results: The general timings of preconception care, prenatal care, and postpartum care were 23 ± 6 , 35 ± 9 , and 20 ± 4 , respectively. The timing of reproductive health care was 7.3 ± 3 . There was a significance difference between the timing of preconception cares (27.4 ± 4 and 18 ± 3 minutes, $P = 0.005$) and prenatal cares (28 ± 7 and 39 ± 8 minutes, $P = 0.005$) in the urban texture and the suburbs of the city. However, there was not a significant difference between these two areas in terms of the timing of postpartum cares (18 ± 3 and 21.5 ± 6 minutes, $P = 0.156$) and reproductive health care (6.8 ± 2.7 and 7.7 ± 3 minutes, $P = 0.139$).

Conclusions: The timing of preconception care and prenatal care was different in suburban and urban texture of the city. Therefore, it is suggested that the required personnel in healthcare centers should be distributed based on the service timing and workload rather than based on the relevant population of the city so that an optimal management of the working staffs is acquired and both the personnel and patients are satisfied.

Keywords: Health System Reform Plan, Reproductive Health Care Service, Urban Texture

1. Background

The main goal of the health system is to improve people's health condition and observe their needs (1). In today's societies, the health needs of the people have changed. Thus, it is essential to reform the healthcare system in all countries around the globe (2). Accordingly, the reform plan in Iranian health system started in 2014 based on three general approaches: Protecting patients from healthcare costs, providing patients with healthcare justice, and improving healthcare service quality (3, 4).

Thus, the health system reform plan started to operate to expand healthcare justice, improve healthcare quality, and increase the satisfaction of patients (5). Based on this plan, 11 service packages are provided to the people via healthcare centers and urban health posts: Self-caring services in worshipping, living, working, educating, and entertaining areas, early diagnostic services for diseases and risk factors, evaluation and diagnostic services for chronic and seasonal diseases, caring services for pregnant and nursing mothers, children and teenagers, middle-aged people and elderlies, psychological consultation services for cov-

ered population, consultation services for healthy nutrition and physical activities, services for social caring consultation, services for improving the management system of contagious diseases, dental health services, working area healthcare services, and healthcare services for disasters (6). One of the main goals of the health system reform plan was to reduce the number of mothers and children, who die because of health issues via providing them with free early healthcare services and magnifying the importance of healthy and natural fertility while decreasing cesarean instances (4). Moreover, the most important asset to each organization is its working staffs, which is why in the recent years, advanced and successful organizations have devoted ample time and investment to their personnel (7). In tandem with any other organization, the working staff play a key role in healthcare organizations (8). Issues, such as epidemiologic features, local problems, and healthcare management models are not the only determining factors in specifying the number of personnel in primary health care. Today, the health system reform plan has required that the distribution of personnel in healthcare centers (especially in the suburbs) should be justly based on their working load. It is necessary to determine the relevant working load in the early executive measures while planning for any type of healthcare services. A specific working load, such as producing any type of goods or providing services, depends on many factors, including the target population, service frequency, and the average timing required to provide services (9). There are usually three methods for measuring the working load, including activity sampling, work sampling, and timing examination. The purpose of timing examination is to specify a standard time for activities. A standard time is the time that an employee with an average motive spends to complete a required task. The first step in timing is to break the working load to different recognizable components. Then, a chronometer is used and a suitable form is designed (10, 11). Previously, some researchers worked on timing of maternal and reproductive health services. Time assessment of health centers in Saghez, west of Iran, and timing of antenatal care service in Nigeria are examples of such researches (12, 13). Since the health system reform plan started in 2014 in Iran and the city of Qom was selected as a piloting city, 42 comprehensive healthcare centers and 132 adjunct urban health posts in the suburban and urban texture have been included in this plan. It is hoped that the results obtained from these cities can be used in all other cities around Iran. Furthermore, precise and reliable information is needed to logically determine the number of employees and to specify the standard timing for services so that efficiency is significantly improved and facilities are aptly used (10).

2. Objectives

This study aimed at evaluating the timing of motherhood and reproductive health care services in suburban and urban comprehensive health centers of Qom city.

3. Methods

3.1. Study Area

The current analytical cross-sectional study was conducted on two suburban health posts and two health posts of urban texture of Qom city during year 2018, to determine the timing of motherhood and reproductive health care services provided by healthcare supervisors.

3.2. Data Collection

Of all the healthcare urban health posts in Qom, two urban health posts in the suburbs and two urban health posts in the urban texture of the city were selected as a cluster. There were 264 person-service motherhood health personnel in four urban health posts, who were timed based on the specified sampling capacity and the service varieties. Hence, for each of the preconception care, prenatal care and postpartum care healthcare packages in each base, 22 person-services and healthy prenatal care packages were timed. In total, 88 preconception care, 88 prenatal cares, 88 postpartum cares, and 92 reproductive health care (356 person-services in total) were investigated in this study. The healthcare urban health posts and required sample size were selected based on the convenience sampling method. The four urban health posts were chosen from four different areas in the city. An 18-hour justification workshop was held to homogenize the methods, types of healthcare services, and content of education given to the target population to coordinate the qualified health supervisors to measure the time of the relevant healthcare services. In this workshop, the required standards of healthy motherhood and fertility and the goals of key educational points were explained to qualified experts. Therefore, 10 supervisors were educated and finally four of them with the highest agreement rate in terms of timing, experience, services, work skills, and academic major were selected as the final supervisors cooperating in the study. Each of these four supervisors attended one of the health centers every day to measure the timing of care. Healthcare timing and healthcare components were measured by two chronometers and enlisted based on direct observations of the supervisor. In this process, the service timings provided for any type of new and periodic health care were recorded by a chronometer. The full timing of a service, as the independent variable in this study, was measured

from the time the conversation started between the patient and health supervisor up to the end of the healthcare service. Likewise, the timing of each service and its components, including preconception care, prenatal care, postpartum care, and reproductive health care cares, was measured by another chronometer. Healthcare service components include those aspects of care that are designed as separate episodes in the SEEB system. This software is an integrated health care system for delivery of primary health care and has been developed after the implementation of health system reform plan in Iran. The “SEEB” is extracted from abbreviation of Persian phrase “Samaneh Yekparche Behdasht”. In this study, other types of follow-up care, such as test analysis and emergency cares were not included in the measurement. Furthermore, in case of power loss or internet disconnection, the timing procedure was stopped and the elapsed time was recorded. After the power or internet was on again, the timing procedure continued. Besides, all the information regarding such problems was listed at the end of the checklist to keep track of time measurement details. After the measurement of timings, the data were recorded in standard timing checklists for motherhood and prenatal health care designed by “SEEB” software defined in health system reform plan. In each caring service package, 50% of services were regarded as new and 50% as repetitious. Moreover, if a mother needed emergency prenatal care, the reason for the special type of treatment was recorded. The time of filling the thromboembolic and cardiomyopathy screening forms were determined at this stage. In line with the standard models of contraception in each base, the reproductive health care out of 23 samples, the first 10 visits of a woman receiving birth interval services (condom, pills, ampoules, EC, and IUDs-at least two from each), and 10 repetitious visits (condom, pills, ampoules, EC, and IUDs-at least two from each) were measured. Besides, there were three child-bearing consultation cases. This questionnaire was only filled by women, who received the entire caring service. All the clients in this study were justified about the purpose of the study and consented to participate and be monitored in the presence of the healthcare supervisors. In addition, the study protocol was approved by the Ethics Committee of Qom University of Medical Sciences.

3.3. Ethical Considerations

The subjects voluntarily participated in the study and a verbal informed consent was obtained. Moreover, the study protocol and the research plan was approved by the Ethical Committee of Qom University of Medical Sciences.

3.4. Inclusion and Exclusion Criteria

People, who came for maternity services, as well as the population covered by the same health post, were included in the study. Other clients were excluded from the study.

3.5. Statistical Analysis

The data of the study were analyzed by SPSS 22 using descriptive statistics, including the mean and standard deviation. Moreover, the timing difference between healthcare services was analyzed by independent samples *t*-test.

4. Results

In each service, 50% of clients in healthcare urban health posts in the suburbs and 50% of clients in the urban texture of the city were timed. Out of 92 clients for reproductive health care in this study, the mean age of clients was 28.5 ± 5.7 in the suburbs and 31.5 ± 5.5 in the urban texture. The mean age of mothers in 88 prenatal cares was 28.8 ± 5 in urban texture and 27 ± 6 in the suburbs. The mean age of women receiving preconception care was 27.4 ± 6 in the suburbs and 30 ± 4.7 in the urban texture. Finally, the mean age of mothers receiving postpartum care was 28.6 ± 5 in the suburbs and 25 ± 5 in urban texture.

Table 1 shows that mean timing of reproductive health care was 7.3 ± 3 minutes in total, which was 7.7 ± 3 minutes in the suburbs and 6.8 ± 2.7 minutes in the urban texture. Based on the results of independent samples *t*-test, there was no significant difference between the timing of services in the suburbs and the timing in the urban texture ($P = 0.139$). However, there was a significant difference ($P = 0.001$) in terms of the components of reproductive health care and child bearing consultation between the suburbs (300 ± 60 seconds) and the urban texture (210 ± 60 seconds). Likewise, there was a significant difference ($P = 0.001$) regarding the timing for registration and searching the names in SEEB system between the suburbs (61 ± 45 seconds) and the urban texture (21 ± 17 seconds). Finally, there was also a significant difference ($P = 0.006$) in terms of the mean of refers in the suburbs (0.19 ± 0.4) and the urban texture (0.14 ± 0.02).

Table 2 indicates the total timing of prenatal care was 35 ± 9.5 minutes and the mean timing of pregnant mothers in the suburbs and urban texture had a significant difference ($P = 0.005$) and was 39 ± 8 minutes and 28 ± 7 minutes, respectively. As for the components of prenatal care, there was only a significant difference ($P = 0.005$) between the mean timings of nutrition healthcare service in the suburbs (220 ± 78 seconds) and urban texture (120 ± 19 seconds). The total timing of preconception care was 23

Table 1. The Comparison of Timing of Reproductive Health Care in the Suburbs and Urban Texture

The Timing of	Total		Suburbs		Urban Texture		P Value
	Number	Time	Number	Time	Number	Time	
Registration or searching the name of referrers in SEEB system (in seconds)	92	39 ± 38	46	61 ± 45	46	21 ± 17	0.005
Reproductive health care consultation (in seconds)	64	218 ± 62	32	300 ± 60	32	210 ± 60	0.001
Condom receiver's services (in seconds)	46	150 ± 34	23	158 ± 42	23	145 ± 28	0.251
Contraceptive pill services (in seconds)	15	205 ± 55	6	230 ± 38	9	188 ± 60	0.157
Emergency contraception services (in seconds)	21	85 ± 43	6	78 ± 29	15	88 ± 48	0.625
Contraceptive injection services (one and three months)	6	453 ± 120	6	453 ± 120	0	0	0
Prenatal care consultation services	11	448 ± 120	5	439 ± 124	6	454 ± 129	0.841
Timing all services (in minutes)	92	7.3 ± 3	46	7.7 ± 3	46	6.8 ± 2.7	0.139

± 6 minutes. The timing of such services was 27.4 ± 4 minutes in the suburban areas and 18 ± 3 minutes in the urban texture, and had a significant difference ($P = 0.005$).

Table 3 shows that there were significant differences ($P < 0.005$) in the following three components: Clinical checkups (1304 ± 225 seconds in the suburbs and 973 ± 273 seconds in the urban texture), the number of refers (1 ± 0.6 in the suburbs and 1.36 ± 1 in the urban texture), and the number of follow-ups (1 ± 0.5 in the suburbs and 0.5 ± 0.5 in the urban texture).

Table 4 shows that total timing of postpartum care was 20 ± 4 minutes and the mean timing of postpartum care was 21.5 ± 4.5 minutes in the suburbs and 18 ± 3 minutes in the urban texture, which were significantly different ($P = 0.0156$). In the postpartum care package, only the first healthcare service was significantly different ($P < 0.002$) between the suburb (1537 ± 233 seconds) and the urban texture (1244 ± 117 seconds).

5. Discussion

The findings of this study showed that the timing of preconception care, prenatal care, and the first postpartum care healthcare services were significantly different in the suburbs and urban texture of Qom in a way that such caring services took considerably longer in the suburban areas. However, the timing of healthy prenatal care healthcare services was not significantly different. It needs to be mentioned that in one component of reproductive health care (fertility consultation), there was a significant difference because this type of service is highly dependent on the social status of the referrers. As for the components of prenatal care healthcare services, although there was a significant difference between the two city areas in terms of the total timing, it was only the nutritional healthcare

service that was significantly different between the suburbs and urban texture. The prediction and analysis of the healthcare costs could help managers reach maximum efficiency via exact preplanning and budget distribution (14). Numerous studies have been conducted in Iran and other countries in this regard. For example, Narayanasamy et al. conducted a timing and motivational study among 19 midwives and health supervisors in six healthcare centers in Pudochery, India, during year 2018. The participants themselves recorded their own daily activities on a time-measuring sheet for six days. Their timing plans showed that they spent half of their time giving healthcare services to mothers and children (15). In this study, the timing of the services was done by direct supervision and via a chronometer and the total timing as well as the timing for each package component was measured in through a valid and standard procedure. In Narayanasamy et al.'s study, however, timing was measured and recorded by the participants themselves during work days. In another study conducted during year 2016, Tani et al. studied the timing of the daily activities of healthcare staff in a four-week period in three rural areas in Tanzania. Their results revealed that in each eight-hour working day, 59.5% of the time was spent for healthcare services and other types of relevant activities. In total, 27.8% of their activities belonged to home-nursing, 33.1% to healthcare education, and only 12.3% to the direct care for the patients. Regarding other types of activities, 7.8% belonged to registration and 2.5% to supervision (16). The current study showed that the required time for performing all the components of motherhood and reproductive health care compared with Tanzania was longer, and the healthcare working staffs provide healthcare services in all their working shifts in Iran. Given the significant differences in a number of investigated healthcare services, it seems that it is better to allocate the working staffs based on the real needs of the cen-

Table 2. The Comparison of the Timing for Prenatal Care in the Suburbs and Urban Texture

The Timing of	Total		Suburbs		Urban Texture		P Value
	Number	Time	Number	Time	Number	Time	
Registration or searching the name of the refers in SEEB system (in seconds)	88	77 ± 63	44	110 ± 42	44	52±47	0.199
Early condition diagnosis (in seconds)	46	703 ± 213	24	947 ± 124	22	618±125	0.876
The clinical prenatal care in first half (in seconds)	43	1280 ± 151	22	212 ± 1350	21	1110±229	0.961
The clinical prenatal care in second half (in seconds)	45	1631 ± 334	23	1785 ± 357	22	1478±237	0.173
Vaccination (in seconds)	51	82 ± 60	28	94 ± 65	23	83±60	0.585
Nutritional healthcare (in seconds)	49	193 ± 53	25	220 ± 78	24	120±19	0.005
Electronic registration of routine tests (in seconds)	21	201 ± 56	9	217 ± 78	12	196±34	0.467
Requesting and reading the sonography (in seconds)	23	107 ± 29	13	102 ± 12	10	106±15	0.338
Special healthcare service	18	232 ± 163	8	377 ± 32	10	244±178	0.152
Refers time (in seconds)	24	60 ± 34	10	74 ± 22	.14	52±37	0.435
Timing all services (in minutes)	88	35 ± 9.5	44	39 ± 8	44	28±7	0.005

Table 3. The Comparison of the Timing of Preconception Care in Suburban and Urban Texture Health Posts

The Timing of	Total		Suburban Areas		Urban Texture		P Value
	Number	Time	Number	Time	Number	Time	
Searching the name of client in the electronic SEEB system (in seconds)	88	50 ± 40	44	67 ± 33	44	28 ± 24	0.045
Clinical preconception care (in seconds)	88	1208 ± 262	44	1304 ± 225	44	973 ± 23	0.005
Electronic recording of test results (in seconds)	12	173 ± 27	2	190 ± 8	10	410 ± 169	0.163
Timing all services (in minutes)	88	23 ± 6	44	27.4 ± 4	44	18 ± 3	0.005

Table 4. The Comparison of Postpartum Care Healthcare Services in Suburban and Urban Texture Health Posts

The Timing of	Total Timing		Suburbs		Urban Texture		P Value
	Number	Time	Number	Time	Number	Time	
Registration or searching the name of the visitor in SEEB system (in seconds)	88	61 ± 61	44	79 ± 64	44	47 ± 69	0.682
The first healthcare service after prenatal care (in seconds)	24	1355 ± 343	12	1537 ± 233	12	1244 ± 117	0.002
The second healthcare service after prenatal care (in seconds)	40	1272 ± 306	20	1311 ± 146	20	1196 ± 79	0.084
The third healthcare service after prenatal care (in seconds)	24	944 ± 280	13	998 ± 180	11	857 ± 247	0.739
Timing all services (in minutes)	88	20 ± 4	44	21.5 ± 4.5	44	18 ± 3	0.156

ters, because the working staffs are the most important asset of any healthcare system. Thus, their complete satisfaction with their job is of utmost importance (17). Therefore, it is essential for managers to calculate the working load of the personnel and specify the required ones in each center based on real needs rather than based on the mere population of that area. Moreover, they can improve the general conditions of these healthcare centers by a fair distribution of personnel. Otherwise, the working staffs in some centers may claim that there is a shortage of required staff, the centers are crowded with referrers, and

the job is extremely difficult for them to handle. On the contrary, some other centers may state that they are facing a shortage of referrers and are overcrowded with the staff. Hence, in both situations, there is a lack of satisfaction and a continuous demand to either increase or decrease the number of personnel. If the management pays due attention to the working load of the personnel, they will become more confident about the satisfaction of their staffs with their activities in line with the goals of the organization. By doing so, the personnel of healthcare centers receive positive feedback from the management and

are motivated to perform their duties (8). Similarly, a scientific management of the working load can increase efficiency yet decrease the wasting of time and studies. It can also motivate the working staffs to perform their duties (8, 10, 18). On the other hand, lack of enough working staffs inflict a heavy load on the personnel and causes tensions between the personnel and referrers. Thus, removing or decreasing such overbearing pressures can directly improve the quality and quantity of healthcare services and the degree of satisfaction of the referrers. In one study conducted in the Iranian context, Zeraati suggested that officials and managers need to adopt measures to manage their personnel appropriately and support them socially so that the working tensions are reduced as much as possible (19). Likewise, comparing the degrees of satisfaction by patients before and after the implementation of health system reform plan, Hashemi et al. found that patients' satisfaction levels regarding healthcare clinical services had decreased after the implementation of this reform plan because less time had been devoted to examination and consultation of the patients (20). As a result, given the threatening factors in the realm of working staffs and the role they play in keeping patients satisfied with the healthcare services, there is a paramount need for the healthcare centers' personnel to receive necessary supporting packages (21). One of the limitations of this study was the presence of the researcher (observing supervisor) for measuring the time that can affect the usual, natural performance of the participants. Nevertheless, this innate limitation is always present in timing studies. Another limitation was that the timing of providing healthcare services may be different among healthcare personnel based on their personal merits, experience, and conditions. However, the current study attempted to control such a factor by including only supervisors, who had the same academic degree, speed, and quality of service. Overall, this study was not only helpful in having an optimal management of resources and in decreasing the costs, yet it can also be used as a tool to plan more appropriate policies in the health system reform plan. However, since the purpose of this study was the timing of reproductive health services, the researchers suggest that the quality of primary health services, such as maternal health care, should be assessed by future studies.

5.1. Conclusions

The timing of preconception care, prenatal care, and first postpartum care services is longer in healthcare centers of suburbs than that of urban texture of Qom city. Similarly, the timing for the working load of motherhood healthcare services is more in the suburban areas than the timing in the urban texture. However, the timing for reproductive health care was not significantly different between

the two areas of the city. Thus, it is essential to hire and distribute healthcare personnel in the health system reform plan based on population distribution, geographical distribution, and the location of healthcare centers. By doing so, not only is there a fairer treatment of health issues in both suburban and urban areas, yet the satisfaction level of healthcare personnel is also increased.

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Footnotes

Authors' Contribution: Morteza Aghahasani: Contributed to the study design and drafting of the manuscript; Masoumeh Farshid Moghadam: Involved in data collection, data entry; Abolfazl Mohammadbeigi: Contributed to data analysis; Abedin Saghafipour: Participated in the study design, data analysis, and drafted the original manuscript; Maryam Khakbazan: Participated in drafting the manuscript.

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References

1. Freudenberg N, Heller D. A review of opportunities to improve the health of people involved in the criminal justice system in the united states. *Annu Rev Public Health*. 2016;37:313-33. doi: [10.1146/annurev-publhealth-032315-021420](https://doi.org/10.1146/annurev-publhealth-032315-021420). [PubMed: [26789388](https://pubmed.ncbi.nlm.nih.gov/26789388/)].
2. De Maeseneer J, Moosa S, Pongsupap Y, Kaufman A. Primary health care in a changing world. *Br J Gen Pract*. 2008;58(556):806-9. i-ii. doi: [10.3399/bjgp08X342697](https://doi.org/10.3399/bjgp08X342697). [PubMed: [19000405](https://pubmed.ncbi.nlm.nih.gov/19000405/)]. [PubMed Central: [PMC2573981](https://pubmed.ncbi.nlm.nih.gov/PMC2573981/)].
3. Imanieh MH, Sadati AK, Moghadami M, Hemmati A. Introducing the Urban Community Health Center (UCHC) as a nascent local model: Will it be a linchpin in the health sector reform in Iran? *Int J Health Policy Manag*. 2015;4(5):331-2. doi: [10.15171/ijhpm.2015.74](https://doi.org/10.15171/ijhpm.2015.74). [PubMed: [25905489](https://pubmed.ncbi.nlm.nih.gov/25905489/)]. [PubMed Central: [PMC4417642](https://pubmed.ncbi.nlm.nih.gov/PMC4417642/)].

4. Mahdavi M, Parsaeian M, Jaafari-pooyan E, Ghaffari S. Recent Iranian health system reform: An operational perspective to improve health services quality. *Int J Health Policy Manag.* 2017;7(1):70-4. doi: [10.15171/ijhpm.2017.89](https://doi.org/10.15171/ijhpm.2017.89). [PubMed: [29325404](https://pubmed.ncbi.nlm.nih.gov/29325404/)]. [PubMed Central: [PMC5745869](https://pubmed.ncbi.nlm.nih.gov/PMC5745869/)].
5. Hasan Y, Parviz SS, Bahram N. Health system reform plan and performance of hospitals: An Iranian case study. *Mater Sociomed.* 2017;29(3):201-6. doi: [10.5455/msm.2017.29.201-206](https://doi.org/10.5455/msm.2017.29.201-206). [PubMed: [29109667](https://pubmed.ncbi.nlm.nih.gov/29109667/)]. [PubMed Central: [PMC5644193](https://pubmed.ncbi.nlm.nih.gov/PMC5644193/)].
6. Yazdani S, Akbarilakeh M. Iranian national self-care support system pattern. *J Minim Invasive Surg Sci.* 2016;5(4). e41637. doi: [10.17795/minisurgery-41637](https://doi.org/10.17795/minisurgery-41637).
7. Hupp JR. The role of staff in successful professional organizations. *J Oral Maxillofac Surg.* 2015;73(3):375-6. doi: [10.1016/j.joms.2014.12.015](https://doi.org/10.1016/j.joms.2014.12.015). [PubMed: [25683039](https://pubmed.ncbi.nlm.nih.gov/25683039/)].
8. Babiker A, El Hussein M, Al Nemri A, Al Frayh A, Al Juryyan N, Faki MO, et al. Health care professional development: Working as a team to improve patient care. *Sudan J Paediatr.* 2014;14(2):9-16. [PubMed: [27493399](https://pubmed.ncbi.nlm.nih.gov/27493399/)]. [PubMed Central: [PMC4949805](https://pubmed.ncbi.nlm.nih.gov/PMC4949805/)].
9. Zanganeh Baygi M, Seyedin H, Salehi M, Jafari Sirizi M. Structural and contextual dimensions of Iranian primary health care system at local level. *Iran Red Crescent Med J.* 2015;17(1). e17222. doi: [10.5812/ircmj.17222](https://doi.org/10.5812/ircmj.17222). [PubMed: [25763257](https://pubmed.ncbi.nlm.nih.gov/25763257/)]. [PubMed Central: [PMC4341539](https://pubmed.ncbi.nlm.nih.gov/PMC4341539/)].
10. Arab M, Fazaeli S, Mohammadpoor M, Pirmoazen V, Yousefi M. Estimating the number of needed personnel in reception department of Children Clinic Center of Tehran Medical University with work and time measuring. *Hospital J.* 2010;8(3-4):1-8.
11. Mathiassen SE, Jackson JA, Punnett L. Statistical performance of observational work sampling for assessment of categorical exposure variables: A simulation approach illustrated using PATH data. *Ann Occup Hyg.* 2014;58(3):294-316. doi: [10.1093/annhyg/met063](https://doi.org/10.1093/annhyg/met063). [PubMed: [24353010](https://pubmed.ncbi.nlm.nih.gov/24353010/)]. [PubMed Central: [PMC3954517](https://pubmed.ncbi.nlm.nih.gov/PMC3954517/)].
12. Kuuire VZ, Kangmennaang J, Atuoye KN, Antabe R, Boamah SA, Vercillo S, et al. Timing and utilisation of antenatal care service in Nigeria and Malawi. *Glob Public Health.* 2017;12(6):711-27. doi: [10.1080/17441692.2017.1316413](https://doi.org/10.1080/17441692.2017.1316413). [PubMed: [28441926](https://pubmed.ncbi.nlm.nih.gov/28441926/)].
13. Parvareh M, Moradi G, Nouri B, Farzadfar F, Rezaei N. [Work measurement and time assessment of health centers in Saghez in 2015]. *Iran J Epidemiol.* 2017;13(3):190-8. Persian.
14. Yusefzadeh H, Ghaderi H, Bagherzade R, Barouni M. The efficiency and budgeting of public hospitals: Case study of Iran. *Iran Red Crescent Med J.* 2013;15(5):393-9. doi: [10.5812/ircmj.4742](https://doi.org/10.5812/ircmj.4742). [PubMed: [24349726](https://pubmed.ncbi.nlm.nih.gov/24349726/)]. [PubMed Central: [PMC3838648](https://pubmed.ncbi.nlm.nih.gov/PMC3838648/)].
15. Narayanasamy NS, Lakshminarayanan S, Kumar SG, Kar SS, Selvaraj K. How multipurpose health workers spend time during work? Results from a time-and-motion study from Puducherry. *Indian J Community Med.* 2018;43(1):5-9. doi: [10.4103/ijcm.IJCM_276_16](https://doi.org/10.4103/ijcm.IJCM_276_16). [PubMed: [29531430](https://pubmed.ncbi.nlm.nih.gov/29531430/)]. [PubMed Central: [PMC5842476](https://pubmed.ncbi.nlm.nih.gov/PMC5842476/)].
16. Tani K, Stone A, Exavery A, Njozi M, Baynes CD, Phillips JF, et al. A time-use study of community health worker service activities in three rural districts of Tanzania (Rufiji, Ulanga and Kilombero). *BMC Health Serv Res.* 2016;16:461. doi: [10.1186/s12913-016-1718-6](https://doi.org/10.1186/s12913-016-1718-6). [PubMed: [27586458](https://pubmed.ncbi.nlm.nih.gov/27586458/)]. [PubMed Central: [PMC5009607](https://pubmed.ncbi.nlm.nih.gov/PMC5009607/)].
17. Zavala MO, Klinj TP, Carrillo KL. Quality of life in the workplace for nursing staff at public healthcare institutions. *Rev Lat Am Enfermagem.* 2016;24. e2713. doi: [10.1590/1518-8345.1149.2713](https://doi.org/10.1590/1518-8345.1149.2713). [PubMed: [27508900](https://pubmed.ncbi.nlm.nih.gov/27508900/)]. [PubMed Central: [PMC4990027](https://pubmed.ncbi.nlm.nih.gov/PMC4990027/)].
18. Ebadi A, Haddad Abdol Abadi M. [Effectiveness of payment systems in health care organizations]. *J Manag.* 2007;1(119-120):84-6. Persian.
19. Zeraati H. Stressors and Stress effects on performance of managers of different hospital units. *J Sch Pub Health.* 2010;6(1):15-26.
20. Hashemi B, Baratloo A, Forouzafar MM, Motamedi M, Tarkhorani MR. [Patient satisfaction before and after executing health sector evolution plan]. *Iran J Emergency Med.* 2015;3(2):127-33. Persian.
21. Kieft RA, de Brouwer BB, Francke AL, Delnoij DM. How nurses and their work environment affect patient experiences of the quality of care: A qualitative study. *BMC Health Serv Res.* 2014;14:249. doi: [10.1186/1472-6963-14-249](https://doi.org/10.1186/1472-6963-14-249). [PubMed: [24923663](https://pubmed.ncbi.nlm.nih.gov/24923663/)]. [PubMed Central: [PMC4064111](https://pubmed.ncbi.nlm.nih.gov/PMC4064111/)].