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Timekeeping – As a Method of Correcting the Working Hours of General Practitioners

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Abstract

AIM: The aim of the study was to study the working time costs of general practitioners (GPs) providing primary health care (PHC) to the population on an outpatient basis, especially during a global pandemic.

METHODS: A temporary study of the workflow of 28 GPs in 14 pilot medical organizations was conducted.

RESULTS: The largest share of the costs of working time of a GP when visiting one patient in outpatient appointments is accounted for working with medical documentation (50.2%). Up to 38.2% of the working time is spent on the main activity when visiting a GP by one patient. For other types of activities – 11.6%.

CONCLUSION: As a result of a time-lapse study of the workflow of GPs providing PHC at an outpatient appointment, the weighted average costs of working time of the GP during a visit by one patient (15.1 ± 0.2 min) were determined.

Introduction

Improving the quality of life of the population is one of the key directions of any state. In the context of a global pandemic, the main way to achieve this direction is to ensure the availability of high-quality medical care through primary health care (PHC) [1].

Improving the provision of medical services and modernizing PHC requires qualitative and quantitative changes in the provision of health-care organizations with medical workers and the distribution of their functionality and workload. In this regard, the key direction of the State Program for the Development of Healthcare of the Republic of Kazakhstan "Densaulyk" for 2016–2019 was the shift of emphasis "from the use of outdated staff norms and standards to the possibility of flexible planning of human resources and labor costs in accordance with the applied technologies, standardized operating procedures, and needs of patients" [2].

PHC reforms include delegating a number of doctor's duties to nurses, introducing a new role of a nurse, digitalizing healthcare, improving the logistical base of medical organizations, and opportunities for a modern diagnosis and treatment process. These require the formation of new approaches in the activities of a general practitioner (GP) and justification of labor standards [2], [3].

The main aim of this work is to study the working time spent by GP on outpatient appointment.

To achieve the aim, there was a timekeeping research of GPs' working process at appointments in 2016–2017.

Methods

The research was carried out in accordance with "Methods of developing working time standards

and workload of health workers" designed by Federal Research Institute for Health Organization and Informatics of Ministry of Health of the Russian Federation [4]. There is a special timecard that has been developed to conduct the 2-week (10 working days) timekeeping research of GP's appointment time management (certificate of state registration of rights N834 of 26 April 2017).

The main purpose of the study is to update the labor standards in medical organizations and to justify labor standards in case of deviations from industry standards.

The timing of the timekeeping research should be sufficient to obtain evidence of labor costs for all labor operations.

Before the study, a list of labor operations and types of work included in the functional responsibilities of the GP was determined. Five types of GP's activities have been identified: Main, auxiliary, working with medical records, conversations related to work, and personal time.

1. Main functional responsibilities: Physical examination, percussion, palpation, auscultation, blood pressure measurement, thermoregulation, respiratory rate, anthropometry, and medical diagnosis;
2. Working with medical records: Examination and management of medical records;
3. Auxiliary functional responsibilities: Preparation for work, technical break for disinfection, if necessary (contagious patients – measles, rubella, tuberculosis, pediculosis, etc.), timeout;
4. Official duties: Conversations with staff related to work, participation in working meetings, and consultations;
5. Personal time.

Research materials

1. All labor operations of the medical staff during the unbiased control of the patient's diagnosis, which was referred to a specialist during the timekeeping research, were registered in the "Time control card," which was adapted.

A separate timecard was developed to conduct a timekeeping research of the time spent by the GP in the clinic.

In this case, to prevent data transfer and loss, it is numbered on the "Time control card". The control card contains information about the employee (name), specialty, medical organization (full name), year, month, date of the control, the time of the beginning, and end of the control. It also shows the total number of registered residents of the clinic and the number of residents registered to a specialist.

2. Before starting the time control, the "Specialist control card" was filled out in consultation with the specialist. All fields on the control card are filled in clearly and completely. Only one "Specialist control card" is opened for one specialist to be monitored.
3. Age, category (according to the WHO age), purpose of visit (first and second visit), and other data of the patient who came to the doctor's office were filled in the "Patient card."

The process of timekeeping research is carried out for two to three specialists who hold the same position (for example, two GPs) from Monday to Friday for 2 working weeks. A clock (stopwatch) must be used during the study.

Thus, during the timekeeping research, each medical worker must have two Mondays, two Tuesdays, two Wednesdays, two Thursdays, and two Fridays.

The timing of this timekeeping research should be sufficient to obtain evidence of labor costs for all labor operations.

The following methods of statistical analysis were used: Analytical, mathematical, and chronometric measurement of simultaneous monitoring. Extensive and intensive values were calculated. This study included six pilot regions of the republic where medical universities are based.

A total of 28 GPs participated in the timekeeping research. The number of required values was calculated according to the formula:

$$N = \frac{2500\left(C^2\left[Cs-1\right]^2\right)}{\left(A^2\left[Cs+1\right]^2\right)}$$

C – Coefficient corresponding to a given confidence level (with the confidence level 0.95 C = 2)

Cs – Standard coefficient of chronosequence stability (C = 2.5)

A – Required observation accuracy (A = 0.95).

In accordance with the calculation results, the number of measurements should not be less than 2035. Within the framework of the study, 5853 measurements were carried out, which are 2.8 times more than the required number.

Results

In each city, two polyclinics were randomly selected (Figure 1.), in which two GPs were selected for research. Research was carried out over 2 weeks (10 working days) during the hours of appointment, which on average takes 4 h. The obtained data on the time spent by GPs were recorded into the time-keeping

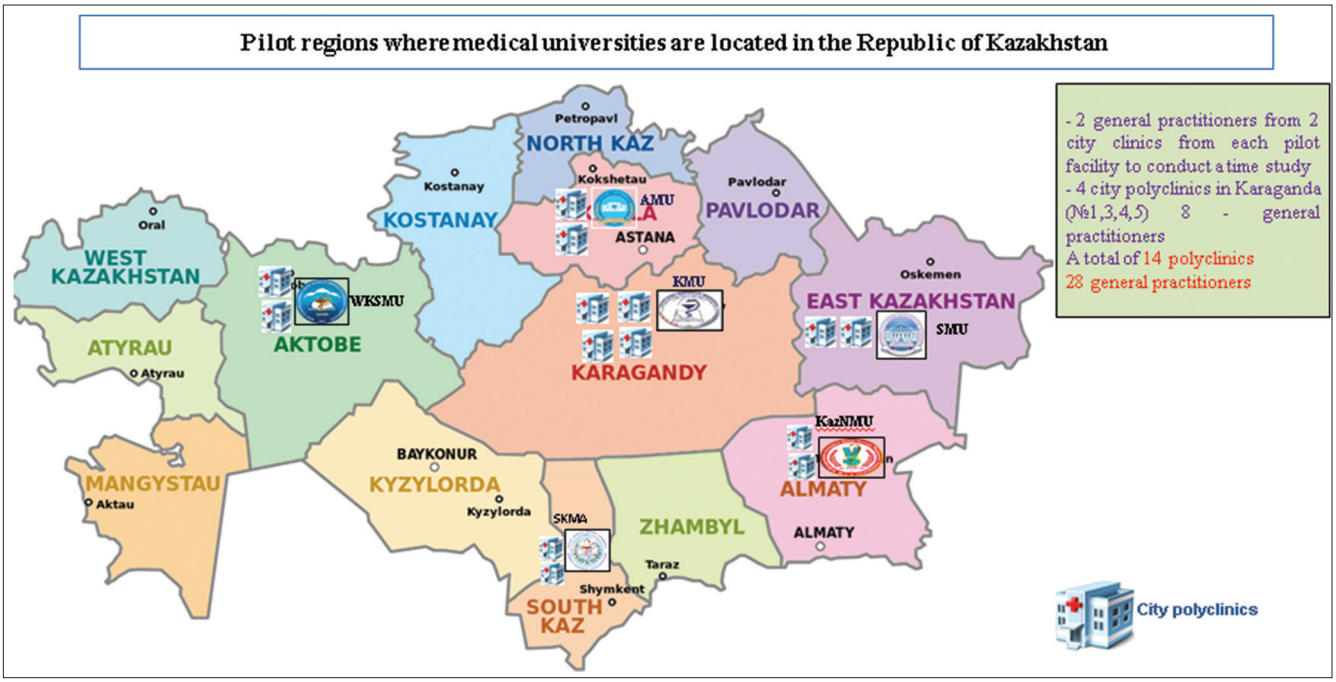

Figure 1: Pilot regions of the Republic of Kazakhstan where medical universities are located

sheet which includes the order and name of labor operations and labor costs for the current time. The city of Karaganda was chosen as the main region, where the study was carried out in four polyclinics: No. 1, 3, 4, and 5. The study involved eight GPs [5], [6].

Rational allocation and use of working time are the key aspects of ensuring labor results. At present, the quality and availability of medical services to the population are especially relevant. This study is aimed at analyzing the timing of the work of GPs in the context of health-care reform and the introduction of new medical technologies.

The need to study the timing, distribution, and use of working time is the main purpose of expanding resources to improve the provision of quality outpatient care.

A total of 28 GP's participated in the timekeeping research. Work experience of GP's varied from 1 month to 28 years.

The time of the initial appointment and the time spent on the patients who returned for follow-up appointment were recorded separately (Table 1).

As you can see, in the polyclinics of Astana and Almaty, the number of secondary appointments is 1.2–1.1 times higher than the initial appointments. In other regions, the initial appointments rate is higher compared to those who came back. The highest rate of initial appointments is in Aktobe; in comparison with the secondary appointment rate, it is 2.5 times higher.

During 10 working days, the largest number of patients was observed by one doctor in the clinics of Almaty, Semey, Shymkent, Karaganda, more than 200 people. The lowest is observed in Aktobe and Astana clinics.

On average, one doctor has 17 (Aktobe) to 22 (Almaty) patient appointments per day (Figure 2).

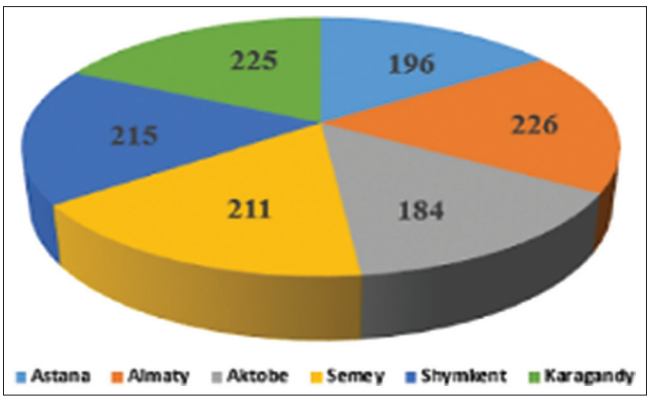

Figure 2: Total number of admitted patients by on GP in 10 business days

On the basis the data of time monitoring, the average values of the initial and follow-up visits of patients to one doctor per day were obtained (Figure 3).

The highest workload was identified in the following cities: Almaty (22.6 patients), Karagandy

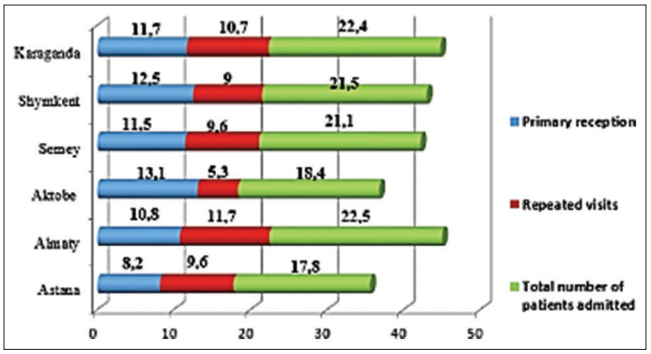

Figure 3: Average values of visits to one doctor per day

Table 1: Attendance rate of initial and secondary appointments

Kazakhstan regions/cities	The number of doctors who participated in the study	The number of initial appointments in 10 days	The number of secondary appointments in 10 days	Total number of patients admitted in 10 days	Average number of initial appointments to one doctor in 1 day	Average number of secondary appointments to one doctor in 1 day	Total number of patients admitted by one doctor in 1 day on average
Astana	4	329	384	713	8.2	9.6	17.8
Almaty	4	433	469	902	10.8	11.7	22.6
Aktobe	4	523	213	736	13.1	5.3	18.4
Semey	4	460	385	845	11.5	9.6	21.1
Shymkent	4	499	361	860	12.5	9.0	21.5
Karagandy	8	939	858	1797	11.7	10.7	22.4
Total	28	3183	2670	5853	11,3	9.3	20.6

(22.5), Shymkent (21.5), and Semey (21.1); the lowest in Aktobe (18.4) and Astana (19.6).

In general, the comparative analysis shows that even if all patients receive the same admission time of 15 min, and one patient receives the first admission (20 min) and the second admission (7.5 min) at different time costs, there is little change in time expenditure. Deviation error is from 0.1 to 0.6 h (Table 2 and Figure 4).

Table 2: Time spent on admission of patients with the time of first admission of patients, the second admission of all patients, and single appointments of 15 min

Time costs	Astana	Almaty	Aktobe	Semey	Shymkent	Karagandy
During a 15-min admission of all patients	4.5	5.7	4.6	5.3	5.4	5.6
During the first admission of 20 min and the second admission of 7.5 min	3.9	5.1	5	5	5.3	5.2
Deviation error	0.6	0.6	−0.4	0.3	0.1	0.4

Only in Almaty and Astana, the time difference for each patient to receive the same 15 min, regardless of the time of the first or return visit to the doctor, increased by 0.6 h.

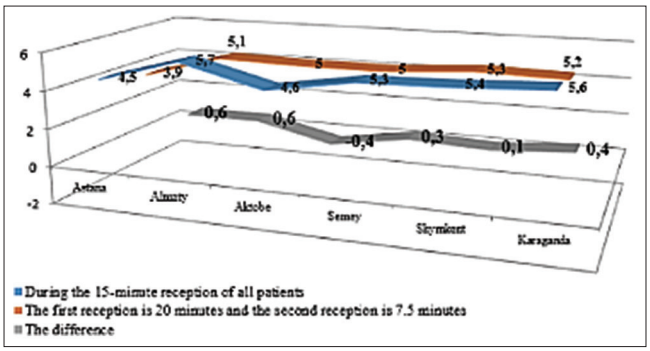

Figure 4: Time differences in the admission of all patients with the same 15 min and other time indicators

Given that the average appointment time for one patient is 15 min (Table 3) (by the Order of Ministry of healthcare of the Republic of Kazakhstan N238 of 7 April 2010), and also knowing the average number of patients admitted for 1 day by one doctor, we calculated the time required for an appointment (Figure 5).

As shown in Figure 5, the time spent by a GP during the initial appointment of one patient ranged from 14.9 min (Karagandy and Shymkent) to 16.2 min (Almaty), and the average value (taking into consideration the data

Table 3: The average time spent on one patient appointment (min.)

The average time spent on one patient appointment in a health-care organization (min.)		
Initial appointment	Secondary appointment	Weighted average time
15.3 ± 0.5	15.0 ± 0.2	15.1 ± 0.2

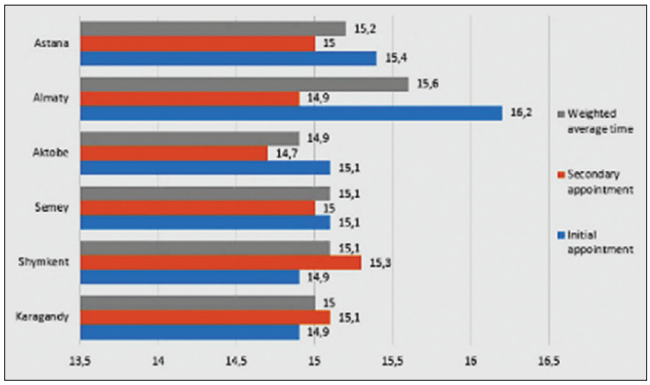

Figure 5: The time spent by a GP during the appointment of one patient in pilot regions

from other pilot regions) is 15.3 ± 0.5 min. Keeping in mind that there were both initial and secondary appointments, the weighted average time varied between 14.9 min (Aktobe) and 15.6 min (Almaty).

As a result, the weighted average time spent by a GP during the initial appointment of one patient is 15.1±0.2 min.

In addition, it is very common for patients to come back for a "minute," including those who have not made an appointment with a doctor and unreasonably take the doctor's time. For such patients, the advice or attention of a general practice nurse is sufficient.

Among the patients who came to the first admission, those with a simple condition or chronic diseases, those who are on preventive care, or those who receive prescriptions, dispensary control, etc., are common. In such cases, it is necessary to distribute the work to extended practice nurses. When admitting patients, the doctor spends a lot of time filling out medical records, so the nurse (extended practice nurse) should be authorized to perform this service.

The structure of GP's working time spent on one appointment divided by types of activities: Half of the appointment time is spent on working with medical records (50.2%). About 38.2% of the working time doctor spends on the main activity – the actual appointment. The other types of activities take 11.6% of the working time (auxiliary functional responsibilities, official duties, and personal time) (Figure 6).

The Table 4 calculates the elements of the labor process that a GP/family physician uses per patient. The elements of the labor process include the main activity, document handling, auxiliary activity, official activity, and the necessary personal time.

Table 4: Distribution of activities of the general practitioner by elements of the labor process during the admission of one patient

Elements of the labor process	Seconds	%	%
1. Duration of the admission	906	100.00	-
The main activity	346	38.2	100.00
Greeting the patient	9	-	2.6
Case history/complaints	80	-	23.1
Recommendations	62	-	17.9
General examination (inspection of the skin layers, turgor, humidity of the skin, and symptoms)	14	-	4.0
Examination of the musculoskeletal system	10	-	2.9
Examination of the oral cavity	9	-	2.6
Examination of the reproductive organ	12	-	3.5
Examination of pregnant women (mammary gland, abdomen, and condition of the fetus)	10	-	2.9
Percussion of the thoracic cavity (heart and lungs)	11	-	3.2
Percussion of the abdominal cavity	18	-	5.2
Palpation (lymph node and thyroid gland)	12	-	3.5
Palpation (heart, organs of abdominal cavity, and mammary gland)	18	-	5.2
Auscultation of the thoracic organs (lungs and heart)	33	-	9.5
Measuring the blood pressure (arterial pressure, respiratory rate, and heart rate)	30	-	8.7
Anthropometry (height, weight, head circumference, chest circumference, and abdominal circumference)	18	-	5.2
2. Document handling	455	50.2	100
Examination of the medical history (reading of the patient file, laboratory results, instrumental diagnostics, consultations, etc.)	103	-	22.6
Filling out the medical records (copying the patient file, preparing the medical certificate, referral for examination, copying the certificate of temporary unfitness for work, referral to other clinics for treatment, registration of the certificate and the prescription, medical and social examination, etc.)	150	-	33.0
Working with computer	202	-	44.4
3. Auxiliary activity	24	2.6	100
Putting on the coat and getting dressed	6	-	25
Preparing the desktop	10	-	41.7
Handwashing	8	-	33.3
Technical break for sanitary cleaning	0	-	0
4. Official activity	61	6.7	100
Phone calls to medical staff	15	-	24.6
Classes with medical staff	10	-	16.4
Participation in working meetings	13	-	21.3
Talking to medical staff	23	-	37.7
5. Required personal time	20	2.2	100
Personal time (break, etc.)	20	-	100

According to the timekeeping research, a GP spends 906 seconds or 15.1 min/patient, and the distribution of this time by the elements of the labor process is shown in Table 4.

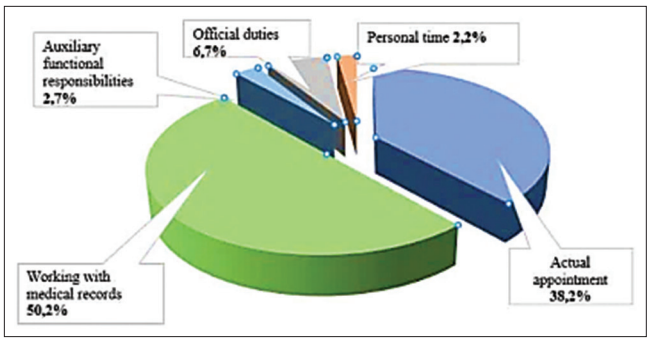

Figure 6: The structure of GP's working time spent on one appointment divided by types of activities

The largest amount of working time in the main clinics under study was devoted to the collection of the patient's medical history (23.1%), followed by the time devoted to recommendations and auscultation of the thoracic organs (17.9% and 9.5%, respectively). Classifying the time spent during the general examination of a patient separately: Greeting the patient and examination of the oral cavity (both 2.6%), general examination (4.0%), examination of the musculoskeletal system (2.9%), examination of the reproductive organ (3.5%), examination of pregnant women (2.9%), percussion of the thoracic and abdominal organs (3.2% and 5.2%), palpation (5.2%), measurement of blood pressure, including arterial pressure, respiratory rate and heart rate (8.7%), and anthropometry (5.2%).

Classifying the time spent by a GP when working with medical documentation: Computer work (44.4%), filling out medical documents (33.0%), examination of the medical history, including reading of the patient file, laboratory test results, instrumental diagnostics, and consultations (22.6%).

In the timekeeping research of the work of a GP, apart from the above-mentioned types of work, we also analyzed auxiliary activity, official activity, and personal time. According to the study, the working hours spent on these activities were as follows: Communication related to the official activity accounted for 6.7% of the total working time, auxiliary services accounted for 2.7%, and only 2.2% were for personal time.

Discussion

The workload of GP exceeds by 1.3 times the standards of patients admitted by one doctor per day. The number of initial appointments on average is 1.2 times higher compared with secondary appointments. Calculations of appointment time (both initial and secondary) required for one patient correspond with standards of workload. Half of the appointment time is set aside for medical records management.

The results of timekeeping research of GPs' working time at an appointment indicated irrational usage of time due to the work with big volume of medical records. The implementation of a digitalization system and electronic document management will allow the doctor to devote more time to working with patients, which means improving the quality of service.

The workload of GPs differs depending on the socio-economic and demographic characteristics of the regions. In cities with "increasing" workloads, where the proportion of young people is over 50%, most of the time is generally allocated to pregnant women and children. Furthermore, the amount of workload depends on the density of the population and its ratio to the number of medical organizations that provide specialized medical care.

The distribution of time and workload of the GP is directly related to the proper organization (management) of the institution as a whole. Availability of documents in electronic form, pre-registration of patients through the electronic portal, availability of ready clinical protocols, and the work

of several nurses help to improve the work of GPs and significantly reduce the time spent on filling out medical documents.

Conclusion

1. The results of timekeeping research of GPs' working time at an appointment led to the following conclusions:
2. The number of patients admitted by one doctor per day ranged from 17.8 to 22.4 that on average is 20.6 patients per day (standard – 16 patients/day). At the same time, the largest workload in terms of admitted patients per day was in the following cities: Almaty (22.6 patients/day), Karagandy (22.5), Shymkent (21.5), and Semey (21.1); the lowest – in Aktobe (18.4) and Astana (19.6) but still above the standard.
3. The number of initial appointments on average is 1.2 times higher compared with secondary appointments. The largest difference is identified in Aktobe where the number of initial appointments is 2.5 times higher than that of secondary appointments; however, the number of admitted patients per day (18.4) is lower than the average rate (20.6) in general. The exceptions were the GPs of Almaty and Astana, as they experienced an increase by 0.9 times in the number of patients who came for a second appointment.
4. Calculations of appointment time (both initial and secondary) required for one patient revealed that the average rate for initial appointment is 15.3 ± 0.5, for secondary appointment 15.0 ± 0.2, keeping in mind that the average appointment time for one patient is 15 min (15.1 ± 0.2).
5. The structure of GP's working time spent on one appointment divided by types of activities shows that half of the appointment time is set aside for medical records management (50.2%) and 38.2% is spent directly on working with patient.

Ethical Approval

Ethical Approval was given at Karaganda Medical University (assigned number 246, protocol number 104).

Author Contributions

Each author has contributed to the following items (1) concept or design, (2) data collection, (3) data analysis or interpretation, (4) manuscript drafting, and (5) critical revision of important intellectual content.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

References

1. State Program of Health Care Development of the Republic of Kazakhstan "Densaulyk" for 2016-2019: Approved by the Ministry of Health of the Republic of Kazakhstan. By the Decree of the President of the Republic of Kazakhstan dated; 2018. p. 634. Available from: http://www.adilet.zan.kz/rus/docs/P1800000634 [Last accessed on 2021 Sep 25].
2. Vechorko VI. Distribution of working time at the outpatient reception of a district general practitioner with a nurse in a Moscow city polyclinic (photochronometric observation). Social Aspects of Public Health. 2018;4:77-28654.
3. Mergentay A, Kulov DB, Bekembayeva GS, Koikov VV, Omarkulov BK. The analysis of working load of general practitioners in the republic of Kazakhstan. Res J Pharm Technol. 2019;12(5):2283-8.
4. Gadzhiev RS, Agalarova LS. Ways to improve the quality and efficiency of labor of district therapists and general practitioners. Direct Gen Practit. 2017;11:32-9.
5. Stardubov VI, Son IM, Leonov SA. Methodology for developing standards of time and workload of medical personnel: Method. Moscow, Russia: RECOM; 2013. p. 28.
6. Mergentay A, Kulov DB, Koikov VV, Omarkulov BK, Sergaliev TS, Imanbayeva G, *et al*. Study of the basic labor activity of a general practitioner using the time-keeping method on the example of polyclinics of the city of Karaganda, Kazakhstan. Indian J Occup Environ Med. 2021;25:60-2.