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NECESSITY FOR HAVING A MEDICAL ASSISTANT IN THE PROCESSES FOR THE SUCCESS OF THE HOSPITAL INFORMATION SYSTEMS

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Abstract:

In order to realize the objectives of the organization, first of all, they are required to have a healthy structure and process. Gaining competitive advantage by a health care facility should be managed with scientific methods in addition to providing good service. Accurate, reliable and prompt data entry in the information systems is under the responsibility of the medical personnel in the health institutions. This process causes heavy burden for doctors who work very busy and results in delays. It also causes completion time of works to increase and sometimes causes works not to be completed, economic losses, cause employee dissatisfaction and even losses of patients. This study will focus on the need of medical assistant in the success of Hospital Information System. The conceptual framework was created in this context, literature search was made and process improvement example was presented for an IVF embryology laboratory process.

Keywords:

Hospital Information System (HIS), Process Improvement, Medical Assistance

1. Introduction

Meeting the requests and expectations of the customers is the biggest purpose of the companies in order to accomplish in the world changing every day. With this purpose, catching the continuous change in the positive direction becomes mandatory for the organizations and has created a ruthless competition environment between them. Applying the correct management systems, following up the technology and fast access to the information have substantial importance in the context of sustaining the success.

The software programs which are developed in order to fast access to the information enable that millions of different data entry are made to different sectors and different databases.

It is seen that the new software used in the healthcare sector and the requirements in the data entering related with this software prevent the doctors, nurses and medical employees from doing the healthcare service, which is their main task. The healthcare personnel who has to pay attention the responsibility of their main task at the forefront fiercely refuses to do data entry to the patient information systems which make that they waste time and which they cause delays and mistakes because they don't present the necessary concentration.

In this study, it is investigated what kind of improvement should be made in the processes by taking the problems of the healthcare personnel into account; the necessity of the assistant healthcare personnel; the qualifications it is anticipated that the medical assistant, as auxiliary healthcare personnel, has to have are stated, the application for the embryology laboratory process of a test-tube baby center was performed in the findings part.

2. Hospital Information Systems

Hospital information systems (HIS) mean the system which brings to the integrity of the information by collecting the information and reporting these data in order to meet the expectations of the internal and external customers of the hospital organizations (Akbolat, 2014:110). The foundation stone of the process and information management system is the adequate, correct and accessible data. It is required that all information and medical records, descriptive of the patient, should be processes suitable and in a detailed way.

Together with the HealthNet project, commissioned by the Ministry of Health, it was made mandatory that all health institutions and organizations, providing healthcare service, see the data, included in the scope of the national health data standards 2.0, in the HealthNet system (Yılmaz, 2014).

It is seen that a lot of studies are included when the literature related with the hospital information software is scanned however even though the necessity of the auxiliary personnel in data entering is mentioned, the articles and theses written related with the medical assistance can't be seen.

Şenel, mentioning the necessity of the auxiliary personnel on the process improvement in the healthcare centers (Şenel, 2004), has found that the doctors are closed to new systems and inadequate in the data entry in the findings based on the results of the tests he made; states that the doctors have hard time for making data entry because of dealing with the problems of the patients as the basis for this determination and points out that they are received a warning from the management of the hospital.

Narlı (Narlı, 2009), in his thesis study, he made, on the patient satisfaction, states that the doctors can't do data entering in due time to the hospital software systems because of the patient intensities.

Bektaş (Bektaş, 2013), in his study related with the material management processes in the hospitals, states that the material requests and demands are not in due time in the medical departments and the necessary consumptions are not deduced from the stocks in timely in the hospital software.

In order to use the data obtained from the health records, they should be adequate, timely and correct. The reliability of the results obtained is completely depend on this quality. It is required that all processes are defined and that the persons who know the work done and can understand the responsibility are assigned and that it is ensured that the works are done timely, correctly and understandably, instead of unqualified and unskilled personnel, for the works to be done become more efficient and productive.

Karapinar (Karapinar, 2006), performed a process improvement study in a hospital enterprise through workflow analysis. She dealt with the topics of process, process improvement and process mapping in his study for production of each product or service, offered to the customer, in line with demands and expectations of the customer and with a low cost for the enterprise. She dealt with the concept of process map and workflow scheme for easier performance of the works in a shorter period.

3. Process Improvement And Control

Lack In order that everybody understands the same thing by the processes, it is required that the description activities are made, the process definition cards, process maps and work flows are established and therefore it is ensured that the process is sensed easily.

Preparing the process map: the process maps contain the stages of each one of the processes, the inputs and outputs of the stages, the decisions to be taken in each stage, the persons who will perform the processes, the duration required for each stage and the relations between the processes.

Work flow chart: flow chart means a quality tool used for establishing the formation histories of the product or service by adding the steps end to end, monitored in the process of formation of a product or service. It is used for determining how the material, required for producing the product/service, flows. The flow charts have importance with respect to decide for determining, observing and finally improving the problems which we will face in the process. It is required know the flow of the process primarily for keeping a process under control. By this way, work flows are mainly used for determining the problem. Furthermore, the work flow chart, in cases where more than one person carry out a task, provides easiness with respect to make it visual with all details as well (Şenel, 2004).

The process improvement is the activity targeting meeting the expectations of internal and external customers at the top level while increasing the total quality, work performances and productivity and decreasing the costs in an organization. (Eroğlu, 2006:43). What should be considered in the process improvement is being able to determine correctly the critical work process.

3.1. Determining critical work processes.

The process which is important but the level of which is low, i.e. which is required to be improved immediately is called critical process. Having too many critical processes indicates that the organization is really in a very bad condition. The process showing one or several of these signs is a critical process and should be improved:

- There are internal, external customer complaints, grievances,
- High process costs,
- Completing the process takes too much time,
- It is seen, known that there are better ways of conducting the process when looking at others,
- New technologies emerged.

When determining the critical processes, the customer satisfaction surveys, employee satisfaction surveys, competition information, product or service quality information, financial and operational performance information, and the experience and anticipation of the top managers are used.

Once the process is designed, it is put into service and no improvement is made on it unless there is any complaint. Each complaint, even if it is at the bottom level, creates a form of the judgment of internal/external customer. What is correct is to find the basic reasons for the main failure, to develop solution and to ensure continuity in improvement, instead of adding a new control and cost layer to the process such that this problem never occurs again upon the complaint.

The enterprise, which suggested its targets and strategies, must present the processes whereby it may ascertain the current status of activities by suggesting owners of these processes and must define the critical processes. Thus, the processes may be improved (Teymur 2009 p.63)

Process improvement is increasing the performance level of the process. The process management and process improvement is not a method for one time; it is important that it is continuous. Because process improvement will be done in the institution, the employees of the institution should be made adopted that it contains continuity and the participation of the employees to the improvement should be ensured.

Let's have an example to process improvement areas from hospitals; such as having physical arrangements compatible with the process flow in polyclinics, monitoring the official papers in the service departments, preventing movement of papers exposed by establishing automation system.

3.2. Methods used for process improvement

Simplification: it is decreasing by eliminating or combining the unnecessary steps, such as waiting, repeated activities, number of approvals, which doesn't add value, not containing any conversation, in the process (İdea 2001 s.169).

Since the processes are complex, the improvement activities must be organized. When we consider the process improvement activities from with a team approach, it enables us to get long-term results and minimize the implementation period (Gonca 2008,p.53).

Changing the decision points: if a decision point will be placed in the process, it is putting these decision points forward, therefore ensuring that all the activity made is made for nothing as a result of negative decision when waning to entire process.

Parallel working: in multiple applications, one activity starts after another one ends. It is ensuring that the activities, which can be done simultaneously, of the activities following each other, are performed before waiting for the process ends in order to decrease process cycle time(Bozkurt 2003).

Simplification: is changing the way the task is done and it is made that it is done simpler.

Outsourcing: is focusing on the activity, which is the organization's main reason for being, by this way procuring the other activities from external resources, therefore ensuring that it is done both with lower cost and by the expert persons.

Authorization/team work: it is decreasing the process cycle time by expanding the task done by the person, decreasing the control and approval steps, authorizing the person, and ensuring the autocontrol. In process improvements and progress of the system, the participation of the employees with recommendations is ensured. It is ensuring that the problem is solved at the source by going down to the root causes and by developing recommendations by the ones doing that task.

Systemic improvements: Such improvements, based on information system, are performed usually as below:

- Doing the activities which are manual at present with integration, carrying out the activities inside the software,
- Speeding up the access to information and the systems,
- Using expert systems.

In order to be able to eliminate the problems occurring in the process, primarily all processes, including the subprocesses, are evaluated and the reasons found are placed to the cause and effect diagram (fish bone diagram).

The cause and effect diagram is a tool for finding different reasons of a problem, putting in an order (Eroğlu, 2006). It is a graphical method for establishing a relation between any problem and factors causing it. The main problem is placed to the head side of the fishbone, the basic and subcauses on the arrows on the spine (Figure 3).

4. Material And Method

In this study, the process flow chart, fishbone diagram prepared by the process owners of embryology laboratory process of a test-tube baby center and the form times table, filled by the, embryologists, and the tables indicating the task times were used.

The application was made in a test-tube baby center having activities in Istanbul since 1996.

As a method, process improvement and process control were preferred and the results are examined together with the control tables indicating the task times of the employees.

The steps followed up in the study are:
Step 1: Determining the critical process
Step 2: Defining the processes with the work flow chart
Step 3: Measuring the forms and filling times and conveying them to the tables,
Step 4: Determining the purpose of the study,
Step 5: Using the cause and effect diagram (fishbone) for solving the problem,
Step 6: Establishing the new work flow, and
Step 7: Entering the new measurement data to the control tables.

4.1. Main processes of the tube baby center in the application
The test-tube baby centers, structurally, have three main processes. These consist of medical, embryology and administrative services. There are physicians and medical support departments under the medical services. The physicians consist of gynecology and obstetrics experts, specialized in their area. The parts which are stated as medical support are psychologist, anesthesia expert, urologist, and alternative treatment experts, outsourced. Embryology is the kitchen of the test-tube baby centers. Embryologists consist of biologists graduated from biology. The administrative services consist of nurses and patient admission personnel.

4.2. Tube baby treatment processes
Tube baby treatment process consists of 5 subprocesses (Figure 1). These processes are completed in 4 weeks in total (Jinekoloji ve Gebelik .Com).

The first process: the first interview and evaluating the couples: in this stage, the couples are examined; if they did have other tube baby trials beforehand, the analysis and treatment information related with them are taken. The pregnancy, miscarriage or birth histories are listened and, after the necessary evaluations are made, the treatment planning is made.

The second process: stimulating the ovary and forming egg: in this stage, it is targeted to develop more than one egg by stimulating the ovaries of the mother to be stimulated by using various medicines. This stage is a process of approximately 10 – 12 days.

The third process: Oocyte picking up process (OPU): in this stage, the eggs developed by using various medicines are picked up, accompanied by ultrasound, by the expert physician under anesthesia in the day and time determined. The sperm sample is taken from the spouse in the same day, if there is no sperm, the sperm is taken with the microtesticular sperm extraction (TESE) process.

The fourth process: intracytoplasmic sperm injection (ICSI) method: in this stage, the oocytes picked up and the sperm sample taken from the spouse are passed through special procedures and a sperm selected from the pool is injected to each matured egg in the determined time. After 16 and 18 hours, it is checked whether they are fertilized or not. The eggs, normally fertilized, are monitored inside special devices (incubator) in the embryology laboratory. This stage is a process of 2 to 5 days.

The fifth process: transferring the embryo inside the uterus: in this stage, the embryo or embryos, reached the required quality, are placed to the uterus of the mother by the expert physician by means of a special cathater. The transfer process is a process lasting shortly like 5 minutes and painless. It is checked whether pregnancy occurs or not by pregnancy test after 13 to 15 days from the transfer procedure.

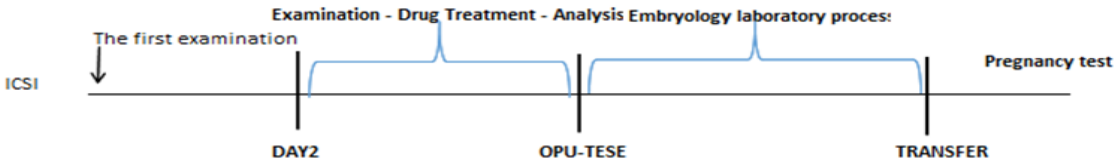


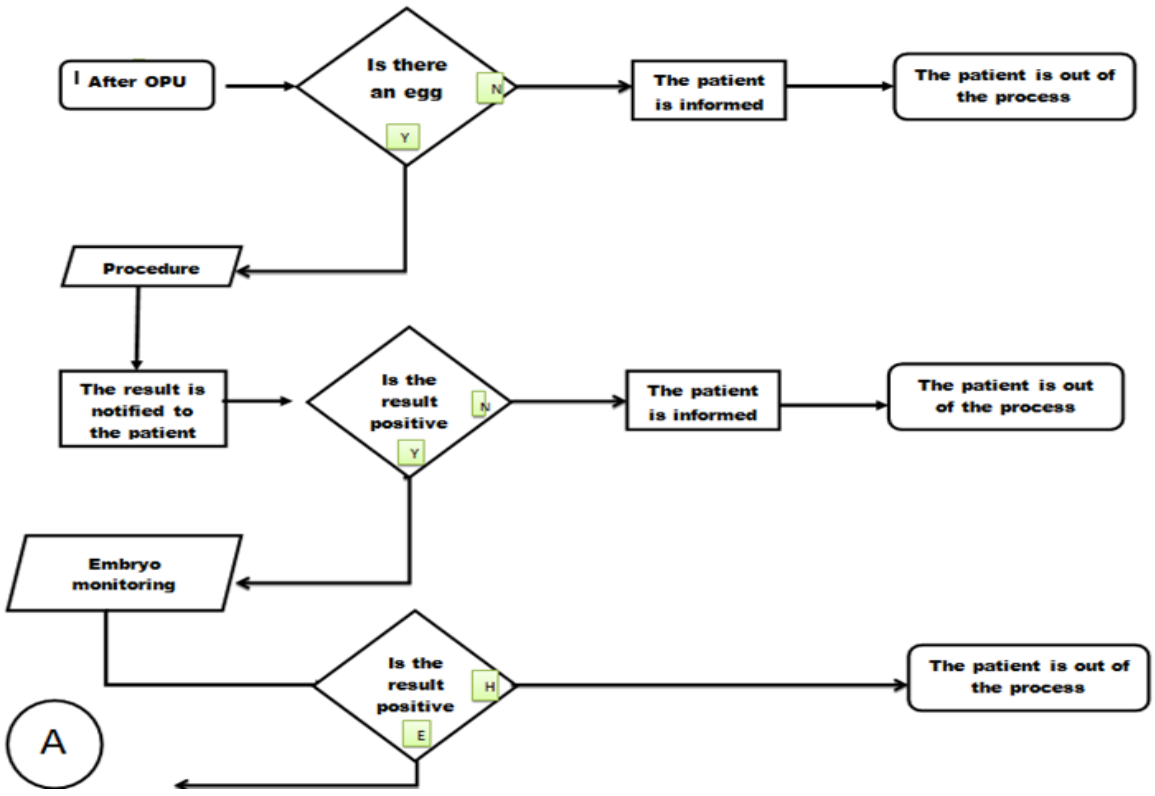
Figure 1. Tube baby treatment process (Jinekoloji ve Gebelik .Com)

4.3. Determining the critical process and process improvement steps

In the study, the experience of the owner of the process and team on the subject was used.

Step 1: the importance leveling was made based on the tasks made and it was determined that the main tasks of the embryologists are treatment and analysis. The tasks, not completed during work hours of the day, causes overly setbacks and dissatisfactions. It was determined that the critical process is the embryology laboratory.

Step 2: The work flow charts belonging to the process was formed (Figure 2). The condition of the process was analyzed by using the work flow chart.



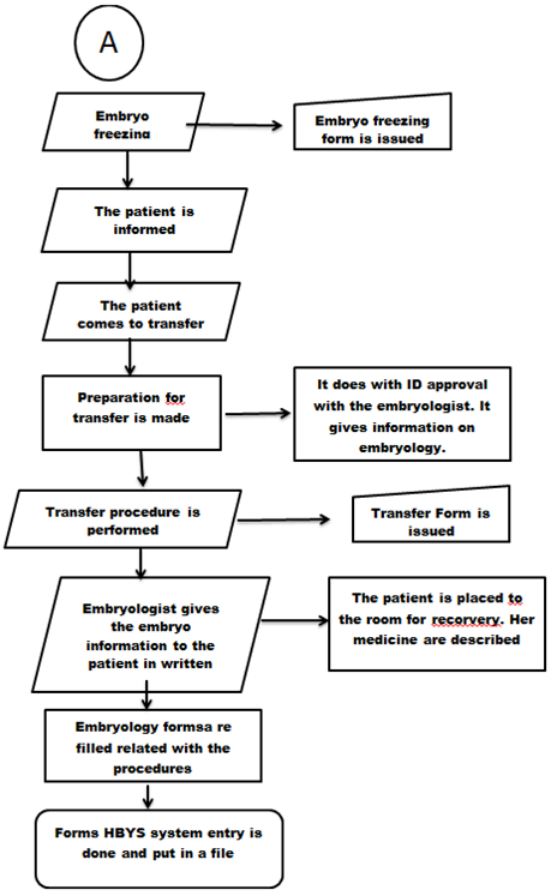


Figure 2. Flow chart of the embryology laboratory before process improvement

Step 3: The times used for the forms filled were measured and entered to the tables (Table 1). With the performance indicators form, in time, the total times of the tasks made by the embryologists were calculated in the tasks done by the embryology laboratory among the tasks analyzed (Table 2).

Table 1. Form times, filled in the embryology laboratory before process improvement

Form	Time (min)	NUMBER	Total (min)
Embryology form	1	60	60
Embryo freezing form	2	10	20
Embryo thawing form Embriyo	2	10	20
Embryo destruction consent form	1	3	3
Sperm freezing form	1	3	3
Sperm thawing form	1	1	1
Sperm destruction consent form	1	0,5	0,5
Semen analysis form	1	6	6
Intrauterine insemination form:	1	0,2	0,2
Embryo transfer report form	1	10	10
Information on the price of embryo freezing without transfer	1	10	10
Notifying the payment information of the patients to the accounting department	1	15	15
Total minutes			**148,7**
Total hours			**2 hours 30 minutes**

Table 3. Task times of the embryology laboratory employees before process improvement

The list of the tasks done by 5 embryologists in the application center				
Tasks	**Attendant**	**Average time per task (minutes)**	**Average daily number of patients**	**Total time**
Thawing the frozen embryos before transfer procedure.	Embryologist	20	10	200
Freezing the embryo	Embryologist	20	11	220
Doing embryo monitoring and evaluation.	Embryologist	3	40	120
Making the embryo transfer procedure.	Embryologist	8	8	64
Participation in the quality control and routine cleaning procedures in the embryology laboratory.	Embryologist	30	1	30
Performing the procedure for puncturing the membrane (Zona pellucida) surrounding the embryo by means of the method called as membrane opening when required.	Embryologist	1	5	5
Participating in the general laboratory cleaning made once a week.	Embryologist	30	1	30
Giving information on fertilization to the patients for which the procedure is applied.	Embryologist	1	10	10
Measuring and recording temperature and CO2 values without opening incubators.	Embryologist	2	15	30
Assessing whether the eggs are fertilized or not after 18-20 hours following intracytoplasmic sperm injection (ICSI) or insemination (IVF) procedure and keeping the necessary records related with this subject and informing the laboratory chief or related physician on the cases which have fertilization problem.	Embryologist	3	10	30
Assessing the embryos developing from the eggs fertilized with respect to the number and quality of cells after 66-68 hours following intracytoplasmic sperm injection (ICSI) or insemination (IVF) procedure and selecting the embryos to be transferred together with the laboratory director.	Embryologist	2	60	120
Making the oocyte picking up procedure (egg picking up)	Embryologist	20	10	200
Denudation procedure (making elimination)	Embryologist	7	10	70
Making contribution to the preparation of culture dishes.	Embryologist	1	10	10
Making microinjection procedure (ICSI).	Embryologist	25	10	250
Taking blastomer from embryos with biopsy procedure for preimplantaion genetical diagnosis.	Embryologist	10	1	10
Preparing various solutions used in the procedures for assessing semen macroscopically and microscopically.	Embryologist	3	1	3
Regularly checking the liquid nitrogen amount present in the liquid nitrogen tank and informing the laboratory officer on the amount of the remaining liquid nitrogen amount.	Embryologist	5	1	5
Making the macroscopic and microscopic assessment of the semen by taking sperm samples given from the sperm collection container.	Embryologist	1	1	1
Performing the sperm washing procedure.	Embryologist	30	1	30
Answering the incoming telephones of the tube baby laboratory and directing them to the related persons.	Embryologist	1	30	30
Completing the missing documents and forms in the patient files.	Embryologist	2	40	80
Placing the material order for the embryology laboratory and recording the incoming material invoices to the computer.	Embryologist	15	1	15
Entering the data of the patients related with the embryology laboratory to the computer environment and making them ready for analysis.	Embryologist	5	60	300
Informing the patients on the date and time when the transfer procedure will be done.	Embryologist	1	10	10
Preparing the list of the patients for which Opu and Transfer procedures will be made.	Embryologist	1	15	15
Total time (minutes)				**1888**
5 Embryologists (time per person)				**377,60**
Hour per person				**6 hours 30 minutes**

Step 4: Determining the improvement needs
One of the most important factors for the success of test-tube baby treatment is the quality of the assisted reproductive treatment (APT) laboratory. In general it is assumed that the effect of the laboratory and embryologists is 50% with respect to the contribution to the total success in the tube baby application. It is required that the tasks providing that such a success occurs are fulfilled with care. It is expected that the embryologists, in addition to treatment and analysis tasks, record the data to the patient monitoring system, used by the hospital, to the systems where statistical data is monitored mandatorily and Healthnet screens within the terms of reference, stated. There are forms required to be filled by embryologists after each process in Embryology and it is known that there is no time left for data input tasks after completing the main tasks. They cause delays and errors unintentionally. A big problem requiring solution is experienced.

Step 5: Fishbone diagram (Figure 3). The reasons affecting not entering data in time, correctly and efficiently to the hospital software are evaluated. The main problem is reached when the subreasons of the reasons are enquired among themselves.

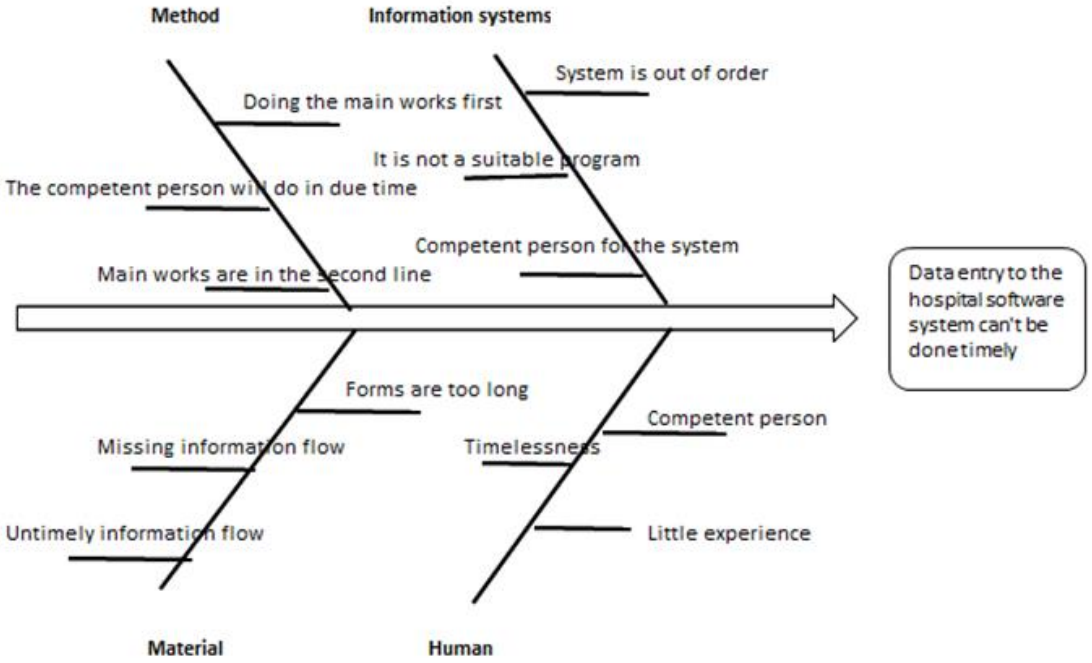


Figure 3. Not making the data entry to the hospital software in due time. Fishbone diagram

Step 6: The reasons were determined and new flow chart was issued for the solution (Figure 4). It was decided to employ auxiliary healthcare personnel however the necessity that this person should have medical knowledge among the qualifications was emphasized. The definition of this personnel to be employed was included to the organization as "medical assistant".

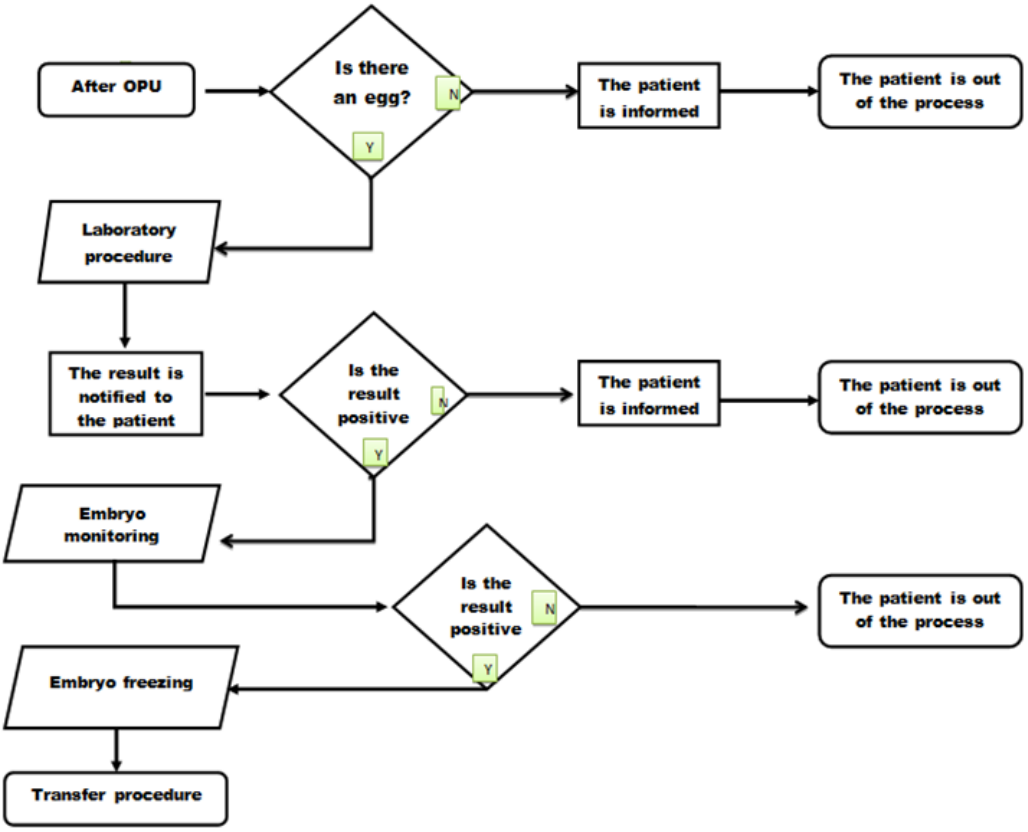


Figure 4. Flow chart of the embryology laboratory after process improvement

Step 7: it was assessed which ones of the times calculated are the tasks without value added for the embryologists. The time performance durations were calculated for the tasks to be done by the medical assistant. The tasks for which change of duty would be done were distributed related with the process. The time for filling the forms by the medical assistant were measured and the gains were determined (Table 3) and the total times of the tasks done by embryologists were measured (Table 4).

Table 2. Form times, filled in the embryology laboratory after process improvement

Form	The percentage of the tasks assumed by the medical assistant	Medical assistant	Embryologist
Embryology form	50%	30	30
Embryo freezing form	40%	8	12
Embryo thawing form Embriyo	40%	8	12
Embryo destruction consent form	100%	3	0
Sperm freezing form	50%	1,5	1,5
Sperm thawing form	50%	0,5	0,5
Sperm destruction consent form	50%	0,25	0,25
Semen analysis form	0%	0	6
Intrauterine insemination form:	50%	0,1	0,1
Embryo transfer report form	100%	10	0
Information on the price of embryo freezing without transfer	100%	10	0
Notifying the payment information of the patients to the accounting departme	100%	15	0
Total minutes		**86,35**	**62,35**
Total hours		**1 Hour 25 Minutes**	**1 Hour 05 Minutes**

Table 4. Task times of the embryology laboratory employees after process improvement.

The list of the tasks done by 5 embryologists in the application center (after medical assistant)				
Tasks	**Before**	**Now**	**Current embryologist time**	**Current medical assistant time**
Thawing the frozen embryos before transfer procedure.	Embryologist	Embryologist	200	
Freezing the embryo	Embryologist	Embryologist	220	
Doing embryo monitoring and evaluation.	Embryologist	Embryologist	120	
Making the embryo transfer procedure.	Embryologist	Embryologist	64	
Participation in the quality control and routine cleaning procedures in the embryology laboratory.	Embryologist	Embryologist	30	
Performing the procedure for puncturing the membrane (Zona pellucida) surrounding the embryo by means of the method called as membrane opening when required.	Embryologist	Embryologist	5	
Participating in the general laboratory cleaning made once a week.	Embryologist	Embryologist	30	
Giving information on fertilization to the patients for which the procedure is applied.	Embryologist	Embryologist	10	
Measuring and recording temperature and CO2 values without opening incubators.	Embryologist	Embryologist	30	
Assessing whether the eggs are fertilized or not after 18-20 hours following intracytoplasmic sperm injection (ICSI) or insemination (IVF) procedure and keeping the necessary records related with this subject and informing the laboratory chief or related physician on the cases which have fertilization problem.	Embryologist	Embryologist	30	
Assessing the embryos developing from the eggs fertilized with respect to the number and quality of cells after 66-68 hours following intracytoplasmic sperm injection (ICSI) or insemination (IVF) procedure and selecting the embryos to be transferred together with the laboratory director.	Embryologist	Embryologist	120	
Making the oocyte picking up procedure (egg picking up)	Embryologist	Embryologist	200	
Denudation procedure (making elimination)	Embryologist	Embryologist	70	
Making contribution to the preparation of culture dishes.	Embryologist	Embryologist	10	
Making microinjection procedure (ICSI).	Embryologist	Embryologist	250	
Taking blastomer from embryos with biopsy procedure for preimplantaion genetical diagnosis.	Embryologist	Embryologist	10	
Preparing various solutions used in the procedures for assessing semen macroscopically and microscopically.	Embryologist	Embryologist	3	
Regularly checking the liquid nitrogen amount present in the liquid nitrogen tank and informing the laboratory officer on the amount of the remaining liquid nitrogen amount.	Embryologist	Embryologist	5	
Making the macroscopic and microscopic assessment of the semen by taking sperm samples given from the sperm collection container.	Embryologist	Embryologist	1	
Performing the sperm washing procedure.	Embryologist	Embryologist	30	
Answering the incoming telephones of the tube baby laboratory and directing them to the related persons.	Embryologist	Medical Assistant		30
Completing the missing documents and forms in the patient files.	Embryologist	Medical Assistant		80
Placing the material order for the embryology laboratory and recording the incoming material invoices to the computer.	Embryologist	Medical Assistant		15
Entering the data of the patients related with the embryology laboratory to the computer environment and making them ready for analysis.	Embryologist	Medical Assistant		300
Informing the patients on the date and time when the transfer procedure will be done.	Embryologist	Medical Assistant		10
Preparing the list of the patients for which Opu and Transfer procedures will be made.	Embryologist	Medical Assistant		15
Total time (minutes)			**1438**	**450**
5 Embryologists (time per person)			**287,60**	**90**
Hour per person			**5 Hours**	**1 Hour 30 Minutes**

5. Findings And Comments

It was found that the embryologists get over the daily working time of 7,5 hours (Table2) and work for 9 hours. The embryologists stated that they postpone the forms required to be filled after the daily works and data entering issue to the next day as secondary task and they place importance to the analysis tasks which are their main tasks. They stated that they conveyed their complaints on the other administrative tasks to the management and wait for the conclusion. They mentioned that they experience motivation and focusing on the work problem and the drawback they experience that this may cause big mistakes with respect to both data entering and the main tasks.

It was found that correct, timely, reliable, and errorfree data entering is made after the medical assistant started working.

The time used by the embryologists for the daily works decreased to 6 hours 5 minutes and it was observed that the ratio of making mistake also decreased because the embryologist can do the works he does during the day more calmly, slowly and regularly.

6. Conclusion and Recommendations

In this study, process improvement was made and the result has shown that the medical part who has difficulties for completing the main works because of intensity during the daily working hours needed assistants in the administrative and systemic tasks. The candidate pool was established by the management related with a medical assistant need, which have biology or medical assistantship training, experienced in hospital software, the interviews were started with the candidates who are expert in their area. As the medical assistant assumes certain tasks, it was measured that the performance of the medical personnel increased.

It should be an inevitable obligation for all departments that it is adopted that the similar studies are also made in the other processes of the hospitals and the times seen as lost are gained and information reliability is ensured.

Today, HIS is considered as a key part which is essential of the clinics for the quality healthcare service. Thanks to HIS, medical education quality increases and the waiting times and bureaucratic procedures decrease. At the same time, thanks to HIS, patient care and medical treatment quality standards also increase and it is prevented that the information belonging to the patients are lost (Yilmaz, 2014).

The biggest hinder before sustaining the successes in the domestic and abroad healthcare services is actually not keeping the files and data of the patients correctly, timely and completely. Regardless how big is the software cost, not being able to produce correct, timely and reliable data brings to patient loss and failure. It is inevitable that suitable precautions are taken.

References

Akbolat, M. (2014), Sağlık Kurumlarında Bilgi Sistemleri. Eskişehir: Anadolu Üniversitesi.

Bektaş, M. (2013), Hastanelerde Malzeme Yönetim Süreci: Bir Üniversite Hastanesi Örneği. Yüksek Lisans Tezi, s. 3-45.

Bozkurt, R. (2003), Süreç İyileştirme, 3. Basım, Ankara: MPM Yayınları No:661, 2003

Eroğlu, C. (2006), Süreç İyileştirme ve Bir Uygulama. Yüksek Lisans Tezi, s. VII.

Gonca, A. (2008), Süreç Yönetiminde Kalite Yönetim Prensiplerinin Uygulanması Üzerine Araştırma. Yüksek Lisans Tezi, s.53

İdea. (2001) Kritik İş Süreçleri Analiz ve Geliştirme Metodolojisi (KİSAG), İstanbul, 2001

Jinekoloji ve Gebelik .Com. (tarih yok). Nisan 01, 2016 tarihinde http://www.jinekolojivegebelik.com/2012/06/tup-bebek-asamalari.html adresinden alındı

Karapınar, S. (2006), İş Akışı Analizi Yoluyla Bir Hastane İşletmesinde Süreç İyileştirme Çalışması. Yüksek Lisans Tezi s. 74

Narlı, Y. (2009), Sağlık Sektöründe Hasta Memnuniyetini Arttırıcı Süreç İyileştirme Çalışmaları Üzerine Örnek Bir Uygulama: Dış kapı Yıldırım Beyazıt Hastanesi Uygulama. s. 82-95.

Teymur, İ.(2009), İşletmelerde Süreçlerin Analizi, İyileştirilmesi ve Süreçlerle Yönetim Yapısının Kurulması ve Uygulama çalışması. Yüksek Lisan Tezi, s.63

Şenel, Ş. (2004), Sağlık Kuruluşlarında Süreç Yönetiminin Uygulanabilirliği ve Bir Uygulama Örneği. Yüksek Lisans Tezi, s. 80-129.

Yılmaz, Y. A. (2014), Sağlık Kurumlarında Bilgi Sistemleri (2. Baskı b.). Eskişehir: Anadolu Üniversitesi.