Determining the Cost of Services in the Labor Ward by Activity-based Costing Method

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Abstract

Background and Purpose: One of the aims of each system is cost management and costing to assist organizations provide quality products and services in a competitive environment. The aim of this research is to calculate the cost of services in labor ward of Niknafs Maternity hospital of Rafsanjan using activity-based costing method.

Materials and Methods: This practical study was done in a Cross-sectional and retrospective form. Data gathered by observation, interviews, reviewing the documents and financial statements of Niknafs Maternity hospital of Rafsanjan in ۲۰۱۷. The maternity centers were first identified. After costing each activity center, the indirect costs of the labor ward were allocated to this ward by direct apportionment method. Microsoft Excel ۲۰۱۳ was used to perform calculations.

Results: The results of the study showed that the cost of services in the labor ward (۲۷, ٦۷٦, ۹۷۰, ۹٦۲) is equivalent to ۸۰,۲٦٪ of the total cost of the total maternity costs (۱۰۳, ٦۰٦, ۲٥۷, ۳٦۱). ۸۷,۰۹٪ of cost of the natural childbirth ward was direct costs, with ۱٤,٦٥٪ for the cost of compensation of employee service, and ۲۱,۹٤٪ of costs for the indirect overhead costs (۱۹,٤٥٪ for support and ۲,۹٤٪

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diagnostic), ۱۲,۹۱٪ of direct overhead costs include ۰,۹۸٪ of building depreciation and tools and equipment, ۱۱,٦۳٪ of the costs related to materials and consumables, and ۰,۲٥٪ related to energy costs of this ward.

Conclusion: The major part of the labor ward costs is related to direct costs, particularly staff cost. Hence, costs can be significantly reduced through proper management and deployment of more efficient human resources, considering the number and distribution of these forces, employing the proper model of products use, supplies and maintenance.

Keywords: Maternity Hospital, Labor ward, Costs, Activity-Based Costing.

Introduction:

Population and its dimensions are the central point of any social system. Demographic developments affect almost all aspects of human life and the world around him, and it affects many social, economic, political and environmental sub-systems, and is the source of dramatic developments in these fields (Shokri & Forough Al-, ۲۰۱۳). Recognizing population and its growth are essential for planning for the comprehensive development of a society (Mehregan, ۲۰۰۹). Thus, knowledge and understanding the demographic changes is one of the ways for a comprehensive development, as all economic, social, and cultural aspects of each society are linked to the size of the population and its structural features (Fuladi, ۲۰۱۱).

It is anticipated that the continuation of the total fertility rate below the succession level will cause the country to rise from negative growth in ۲۰٤٦. In the current circumstances, the pattern of fertility reduction, the diminution of household size, low birth rate and even having one child have become widespread in most parts of the country. Creating economic, social, and cultural contexts, including direct government policy in the field of birth control over the past decades and weaknesses in some of the indicators of maternal health programs are the factors influencing this circumstances (Akbarzadeh et al., ۲۰۱٤).

Normal labor method is considered as one of the indicators for evaluating the performance of maternal health programs and increasing the rate of cesarean section, especially increasing the unnecessary cesarean, indicates an inadequate performance in the health system of the country, which has had an impact on the fertility rate of the country, and because of its complications, it prevents the birth of newborns and reduces the frequency of childbearing. Regarding the general policy of increasing the population, it is necessary to reduce the amount of cesarean section and labor interventions in a reasonable and meaningful manner, because the cesarean section by prolonging the next pregnancy, increasing the probability of secondary infertility and performing repeated cesarean sections (due to the hospital conditions in Iran) continues to reduce fertility rates. In other words, cesarean section is a complementary behavior in family planning and total fertility rates (Rortveit et al., ۲۰۰۳). On the other hand, contrary to the public's perception, maternal health in cesarean section is more at risk.

Nowadays, in advanced countries, labor is considered a great success for women and selective cesarean section is a failure (.Morrison, Rennie & Milton, ۱۹۹۵ & Rortveit et al., ۲۰۰۳).

According to research conducted in Iran, more than ۷۰٪ of pregnant women want cesarean section for unnecessary reasons, ۹۲٪ of which are due to fear of labor pain and complications of normal labor (Ali et al.,۲۰۰۳ & Mosadegh ,Malekiha ۲۰۰۵), while contrary to the beliefs of mothers in the absence of specific problems, normal labor is safer than cesarean section. Furthermore, pain, weakness, disability, recovery period (Ali et al., ۲۰۰۳), and physical problems after cesarean section are higher than normal labor (Torkan et al., ۲۰۰۹).

Lydon et al. (۲۰۰۱) conducted a study with the purpose of linking the type of labor to the general health of primiparous women at ۷ weeks postpartum. The results indicated that women with normal vaginal labor had a better general health status than women with cesarean section in different aspects (Lydon-Rochelle &Martin, ۲۰۰۱).

Hence, one of the main issues of health, particularly after the implementation of the health promotion plan in the country, is the discussion of normal labor and the increase in the acceptance of this type of

labor among young women. Therefore, any investment in this sector also affects the returns of other sectors of the economy and society (Mobaraki et al.,۲۰۱۲), which is the first requirement for managers and policy makers in the health and treatment sector, to know how to spend resources and cost service (Ghiyasvan et al.,۲۰۱۳).

Since valuable government information is generally and vaguely recorded and collected that does not respond to management needs in decision making and planning (Mahmoudi & Ghahraman.,۲۰۱۵), and on the other hand, the cost analysis can be auxiliary to better utilization of limited resources (Arab, Yousefvand & Zahavi ,۲۰۱۳). The purpose of any cost management system is to provide accurate and practical information to help organizations deliver quality goods and services in a competitive environment (Beyranvand et al., ۲۰۱٦). According to the above necessity, the present study was considered to study the calculation of the cost of services provided by the Niknafs Maternity hospital of Rafsanjan ۲۰۱۷ by activity-based costing method.

Despite of traditional budgeting which does not match the allocation of resources and volume of activity, the cost-based costing is based on the activity of the organization's resources on the basis of activity per unit (Afshari et al., ۲۰۱۳ & Z., ۲۰۰۷). This system calculates the appropriate modalities for the effects of changes in activities, complexities, variations and specific features of each activity (Z., ۲۰۰۷). In the activity-based costing method, activities are identified as new cost issues, and overhead costs are determined on the basis of logical foundations, called cost drivers, and the costs assigned to them are based on the logical bases of products as final cost issues are allotted. In fact, this method is the cost allocation system with emphasis on the continuous improvement process (Ross, ۲۰۰٤). For this reason, healthcare organizations have invested heavily in using cost accounting systems such as activity-based accounting in recent years (Lievens, Van den & Kesteloot, ۲۰۰۳). Moreover, at the hospital level, lack of information resources and reliance on the government budget, lack of clarity and the lack of clarity of the actual costs of services provided, led to inefficiency of spent resources and some of their losses (Hadianet al., ۲۰۰۹).

Therefore, cost analysis in the hospital industry is important in order to provide financial resources, proper financial planning in future periods, and evaluating the projects within the hospital industry and determining the pricing strategies (Rezapour et al., ۲۰۱۲). In order to make efficient and effective decisions, managers need to be aware of the costs incurred in hospitals in an accurate and realistic way. This information is out of the accounting and hospital systems that are of great importance in calculating the cost of the services provided (Tofangsaz et al., ۲۰۱۳).

Several studies have been conducted to determine the cost and cost of services. Dimitra Karabatsou et al. have studied the costs of changing the services of the intensive care unit in micro cost analysis. Eventually, they concluded that the variable cost of each bed was ۵۷۳ euros per day. The main cost variable for each patient in total cost related to the drug cost was ۱۱٦ to ۲٤۳ euros (Karabatsou et al., ۲۰۱٦). Brian et al. studied time-based activity costing in emergency medicinal and finally, the emergency department managers can focus on improving the value of services, and the timing-based costing method can be used to continuously improve processes (.Brian &Yunmd Mmpedsr, ۲۰۱٦). Sothummnon et al. tested the application of activity-based costing systems in several hospitals, and concluded that there was no shortage of treatment costs in other costing methods (Suthummanon, Omachonu & Akcin, ۲۰۰۵).

Rensburg et al. at the Helen Joseph Hospital, using the ABC method, provided realistic estimates of mental health care costs and created a quality assurance cycle, and concluded that the ABC method could facilitate central cost management and reduce it.and cost optimization (Van Rensburg & Jassat, ۲۰۱۱).

Lewis et al. In a study analyzed the actual costs of hospital, emergency and outpatient services in a hospital in Dominican, and concluded that the funds allocated to this hospital were ۵۰٪ higher than the actual costs of the services provided (Lewis & La Forgia ,۱۹۹٦). Ergun et al., in a study in Turkey, concluded that the cost of the pathology tests mentioned in the health tariff was significantly different from reality (Ergün, Ağirbaş & Kuzu, ۲۰۱۳). Rezapour et al. In a study to calculate the cost of services

in the diagnostic departments of the educational centers of Qazvin University of Medical Sciences based on activity-based costing technique and concluded that ٦٨٪ of hospital operating costs were personnel costs and ٣٢٪ The rest was non-personnel costs (Rezapour et al.,٢٠١٢).

Aienparast et al. in a study examined the possibility of using the ABC-based costing model to calculate the cost of diagnostic radiology services and ultrasound services at the centers of the contracting party of the health insurance organization. The results of the study showed that the financial record of the hospital's financial data was one of the main factors influencing the feasibility of using the cost-based costing technique in calculating the cost of services (Aeenparast et al., ٢٠١٥). Moinuddin et al. in a study to determine the cost of the cardiac care services. The results of the study showed that the bulk of the cost of employee wage costs is considered almost constant and cannot easily be eliminated. Therefore, it is necessary to optimize the use of the staff and make the feasibility of the possible establishment of new beds or the development of this section (Moeinoddin et al., ٢٠١٥).

Javanbakht et al. used a cost-based activity-based methodology to determine the cost of hospital video services. The results of the study showed that due to the significant contribution of overhead costs to reducing the average cost of services, the volume of services provided should increase (Javanbakht et al., ٢٠١٣). Afshari et al. reviewed the cost of services at Imam Khomeini Imaging Center of Tehran University of Medical Sciences and concluded that by managing costs and eliminating unnecessary costs, the cost of services would be maintained by maintaining the necessary productivity decreases and enables the organization to survive and develop on the basis of its strategic activities (Afshari Safavi & Naghibi, ٢٠١١). Bahrami and Zare also studied the cost of radiology services at the Shafa Hospital of Kerman city based on activity-based costing method and found that it can be achieved through improvement of performance, in particular, the correction of human resources management measures and standardization of consumption Reducing consumer spending has reduced the cost of services (Bahrami &, Ebrahim, ٢٠١٧). Due to the lack of evaluation of the cost of services for the natural part of normal delivery in Iran, this study was conducted.

Method

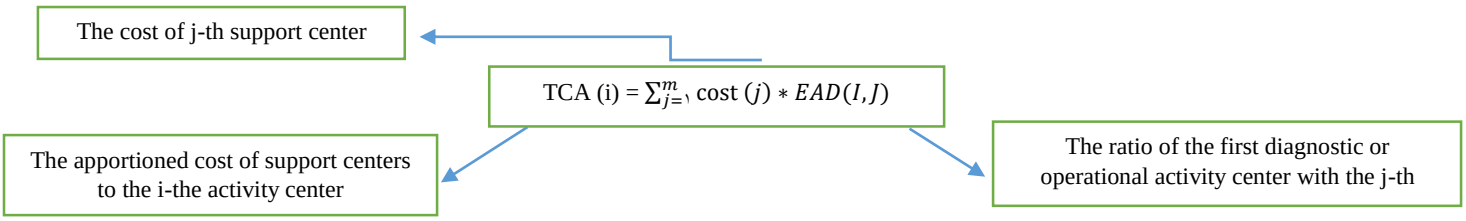
This practical study was done in a Cross-sectional and retrospective form to determine the cost of services provided by the Niknafs Maternity hospital of Rafsanjan in ۲۰۱۷. Interview data collection tool for identifying the activity centers of the maternity hospital and adapting it to the organizational chart, observing the implementation of the existing tools and equipment in the centers with the list of tools and equipment and examining the documents in the accounting system to extract the costs of each one of the centers of activity. At first, the maternity centers were identified and divided into three categories in terms of the operation: payroll accounting, income and clearance accounting, public inventory, fund, property accounting, supply department, staffing, secretariat and archive, mailing, security, security office, management, reception, health information technology, nursing office, nutrition and kitchen, quality improvement, library, facilities, green space, ambulance, transport, pharmacy, pharmacy storage, telecommunication, diagnostics, including laboratories, ultrasonography and operations Centers, including activity centers of maternity block, department, emergency room, vaccination and maternity clinic. For the collection of financial information, a framework is designed as presented in Table ۱, adapted from relevant research (Rajabi, ۲۰۰۳; Rezapour et al., ۲۰۱۲ & Mahmoudi, Ghahraman, ۲۰۱۵).

Table ۱: Collecting financial data and Foundations for Receiving and Apportioning normal labor costs in ۲۰۱۷

Activity Center Name	Cost Basis	Basis of Cost Apportioning to Other Activity Centers	Number of employees	Human Resources Cost	Consumables Cost	Depreciation of property and Buildings Cost	Overhead Cost	Total Cost

Then, the costing of each activity center included direct and indirect costs related to fiscal year of ۲۰۱۷, labor costs, materials and consumables, depreciation of property and buildings. In the next step, in order to allocate the costs of the support center to the diagnostic and operational centers, the EAD matrix first

established the link between the support centers (matrix columns) and the operational and diagnostic activities (matrix rows) As (j,i) EAD indicates the relationship between the thirty-first diagnostic or operational activity center with the j-th support center, and due to the causal relationships between these centers of activity and stimuli, the defined cost of the EAD matrix was low and the share of each activity center operational and diagnostic support from the Support Center was identified and the indirect cost of the supported support centers was calculated using Formula ١.



Formula ١: The Formula for Calculating Apportioned Costs from Support Activity Centers to the i-th Diagnostic or Operational Activity Center

The contribution of the labor wad activity center was determined from the diagnostic activity centers. In this research, the basis for the sharing of the cost of support centers to the diagnostic and operational activities of the centers, as well as the basis for the sharing of the diagnostic activity center to the operational centers, was described in Table ٢ (Mahmoudi & Ghahraman,٢٠١٥; Beyranvand etal.,٢٠١٦ ; Moeinoddin et al. ,٢٠١٥ & Namazi, Ghafari , Ebrahimzade ,٢٠١٣) and with the total direct costs of the activity center labor ward plus indirect costs including overhead costs (energy consumption, repairs, etc.) plus additional overheads from support centers, plus an overhead allocation from the diagnostic activity centers, the cost of the natural parturition. All the materials used in the article are included with the author's name in the text and sources. In order to carry out the research,

Table ٢: Foundations of Cost Apportioning in Labor Ward in ٢٠١٧

the necessary permissions were obtained by the researcher. Maternity and nursing staff members were aware of the nature and purpose of the research, and it was assured that, if requested, the results of the research would be available to the practitioners.

Findings

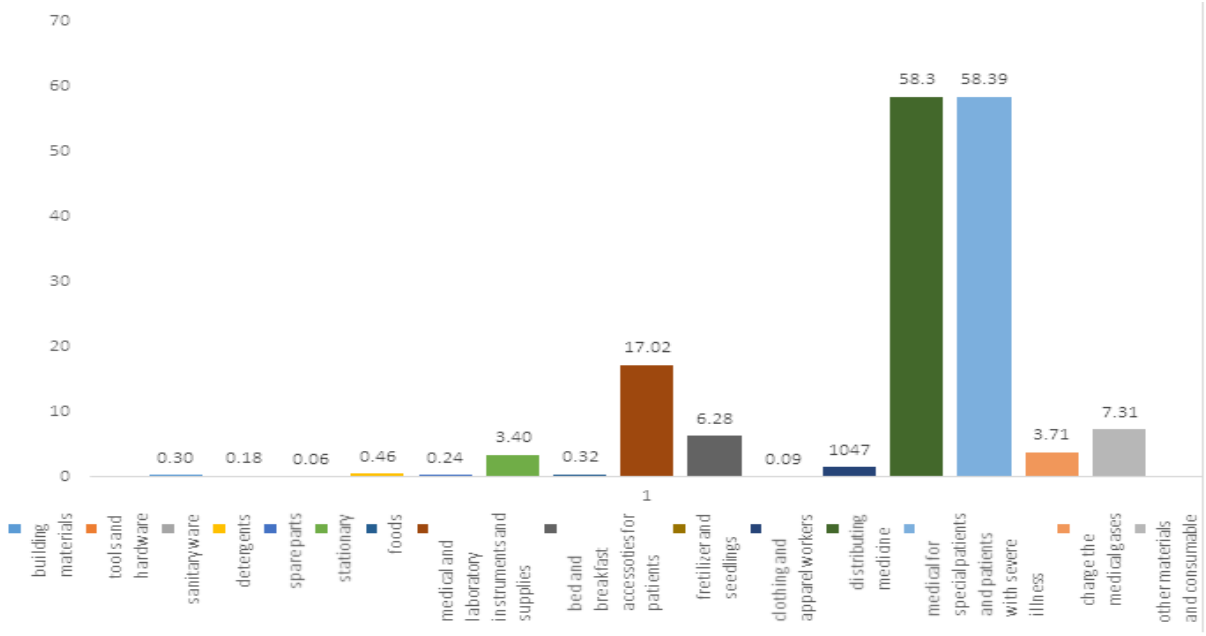
The costs of the labor ward activity center are described in Table ۳ and without the cost of apportioning the support centers and diagnostic centers. As noted, the major part of the cost of labor ward is related to human resource equal to ۸٤,۸٦٪ of the cost of this ward.

Table ۳: Labor Ward Costs before Apportioning Support and Diagnostic Costs by Cost Category in ۲۰۱۷

Total	Overhead	Cost of depreciation	Materials and consumables	Manpower	
۲۷/۷٦۷/۹۷۰/۹٦۲/۸۸	۲۷۳/۸٥۲/۳۲۸/۳۳	٤۳٤/٥۰۰/٤۰۷/٦۱	۳/۲۷٥/۸۲۸/٤۲٦/٤۳	۲۳/۷۸۳/۷۸۹/۸۰۰/٥۱	**Center for Natural Birth Delivery**
۱۰۰/۰۰	۱/۰٤	۱/٦٥	۱۲/٤٥	۸٤/۸٦	**Percentage of costs**

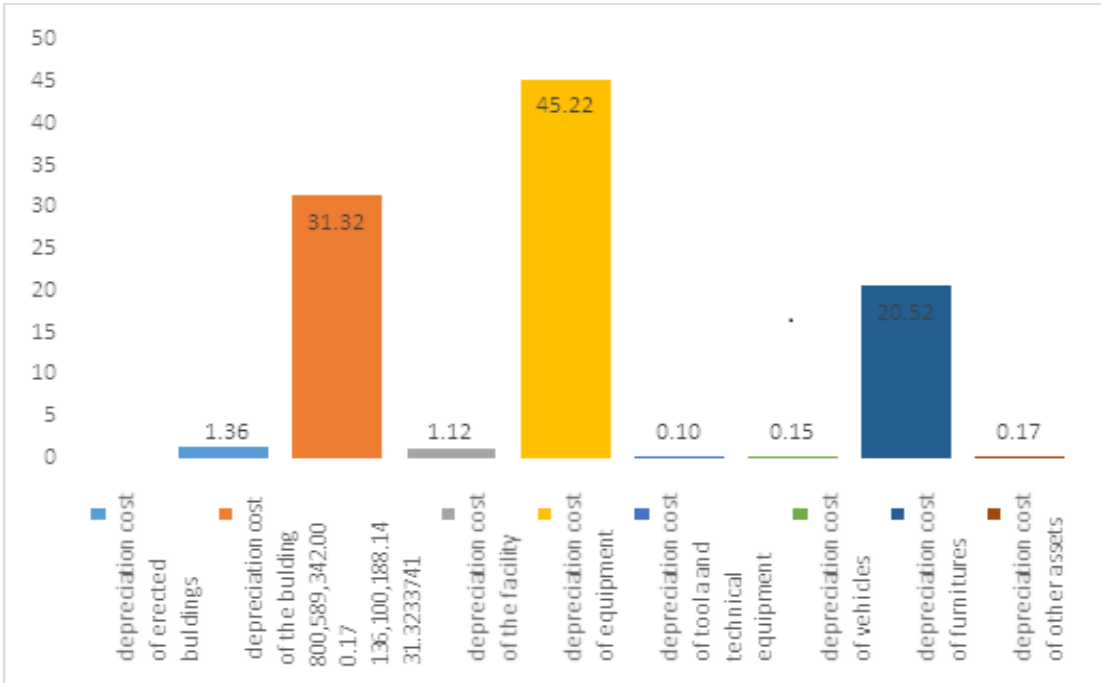
۱۷٪ of maternity expenditures for maternity wares were related to labor ward and the total cost of the labor ward was ٤٥,۱۲٪ related to materials and consumables as described in Diagram ۱.

Diagram ۱: The Ratio of the Costs of Materials and Supplies Consumed in the Labor Ward of Maternity Hospital of Rafsanjan in ۲۰۱۷



١٦,٩٩٪ of the depreciation costs of maternity facilities belonging to the labor ward of the maternity hospital, which is equal to ١,٦٥ percent of the total cost of the normal labor ward, is described in Diagram ٢, and the major part is ٢٢,٤٥٪ related to the depreciation of the Medical equipment.

Diagram ٢: The ratio of Depreciation Costs of Buildings and Property in the Labor Ward of Niknafs Maternity Hospital of Rafsanjan in ٢٠١٧



۱۷٪ of the overhead costs of maternity hospital are related to the labor wad, which was ۱٪ of the total expenditure on the normal labor unit account, and the major part was ۵۵ .۳۷ % of the cost of maintenance and maintenance of assets.

Diagram ۳: The Ratio of Overhead Costs in the Niknafs Maternity Hospital of Rafsanjan to the Activity Center of Labor Ward in ۲۰۱۷

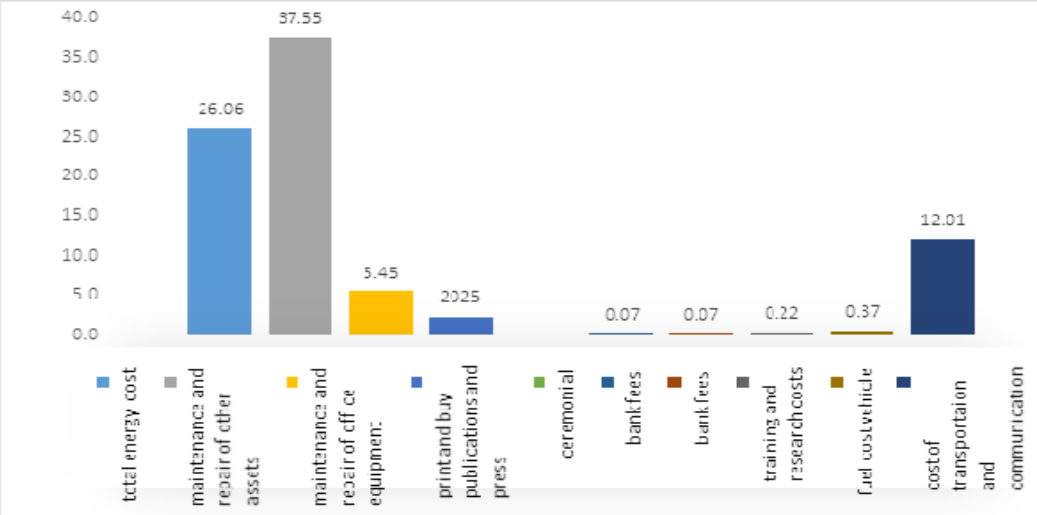


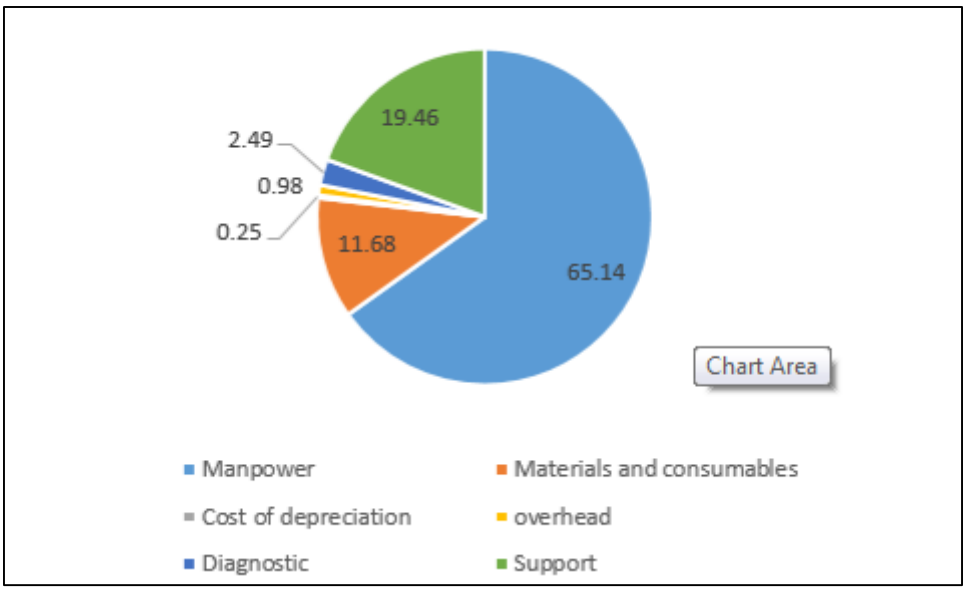
Table ٤: Apportioning the Support Cost in the Niknafs Maternity Hospital of Rafsanjan to the Activity Center of Labor Ward in ٢٠١٧

Support activity Center	Pregnancy Clinic	Screen	Emergency	Women's Section	Vaccination	Section	Childbirth block
Costs	١٢،٥٨٢،٣٩٤،٠٠	٤٢٩،٣١٨،٧٤٧،٠٠	٦،٤٧٦،٠٤٧،١٣٠،٠	٨،٧٤٦،٢١٦،٩٤٢،٠	٣٧١،١٧٤،٩١٣،٠٠	١٤،٥٥٧،٥٠٠،١٥٧	١٢،٣٦٠،٩١٩،٣٤٩.
Amount divided into normal delivery	٢،١٣٩،٠٠٦،٩٨	٧٢،٩٨٤،١٨٦،٩٩	١،١٠٠،٩٢٨،٠١٢،١٠	١،٤٨٦،٨٥٦،٨٨٠،١٤	١٣٧،٣٣٤،٧١٧،٨١	٥،٣٨٦،٢٧٥،٠٥٨،٠٩	٩،٢٧٠،٦٨٩،٥١١،٧٥
Share of Natural delivery department	٠،٠٠٨٩٩٣٥٥	٠،٣٠٦٨٦٥٢٥٤	٤،٦٢٨٩٠٠٦٩٨	٦،٢٥١،٥٥٥،٧٥٥	٠،٥٧٧٤٢٩٩١٧	٢٢،٦٤٦،٨٣٢،٥٨	٣٨،٩٧٩،٠٢٥٥٩
Support activity Center	Total	Laboratory / Blood Bank	Sonography	CSR	supervisor	infection control	Training supervisor
Costs	٥١،٨١١،٢٧٥،٧٤٥،٠٠	٣،٥٠١،٥٠٩،٩٢٧،٠٠	٦٠٥،٥٣٧،٦٤٤،٠٠	١،٨١١،٤٤٧،٢٤٨،٠٠	٢،١٠٠،٤٥٧،٢٠٦،٠٠	٤٣٢،٩١٣،١١٢،٠٠	٤٠٥،٦٥٠،٩٧٦،٠٠
Amount divided into normal delivery	١٨،٩٦٢،٩٨٥،١١٣،٠٧	٥٩٥،٢٥٦،٦٨٧،٥٩	١٠٢،٩٤١،٣٩٩،٤٨	٣٠٧،٩٤٦،٠٣٢،١٦	٣٥٧،٠٧٧،٧٢٥،٠٢	٧٣،٥٩٥،٢٢٩،٠٤	٦٨،٩٦٠،٦٦٥،٩٢
Share of Natural delivery department	٣٦،٦٦١،٢٣١٥٨	٢،٥٠٢٧٨٣١٦٧	٠،٤٣٢٨٢١٦٨٤	١،٢٩٤٧٧٢٧٦٢	١،٥٠١٣٤٩١٤٦	٠،٣٠٩٤٢٤٤٠٧	٠،٢٨٩٩٤٨١٨١

Support activity Center	Costs	Amount divided into normal delivery	Share of Natural delivery department
Nursing Station	٧٦٣.٦٤٠.١٩٢	١٢٩.٨١٨.٨٣٣.٦٤	٠.٥٤٥٨٢٩٠٤٥
Reception	١.٥٦٨.٠٩١.٥١٣	٢٦٦.٥٧٥.٥٥٧.٢١	١.١٢
Cash desk	٥٩٥.٢٦١.٠٣٣	١٠١.١٩٤.٣٧٥.٦١	٠.٤٢٥٤٧٦٢٤٤
Pharmaceutical affairs	١.٤٢٨.٤٧٣.٤١٥	٢٤٢.٨٤٠.٤٨٠.٥٥	١.٢١٠.٣٣٥٨
Aid	٣٩٨.٩٨١.٩١٧	٦٧.٨٦٩.٩٢٥.٨٩	٠.٢٨٥١٨١٣٢١
IT	٥٩٦.٧٢١.٣٠٩	١٠١.٤٤٢.٦٢٢.٥٣	٠.٤٢٦٥٢٠٠١
Education	٢٧٥.٣٥٠.٩٢٥	٩٩٩.١٧٠.١٩٧	٤٦.٨٠٩.٦٥٧.٢٥
Presidency	٩٩٩.١٧٠.١٩٧	١٦٩.٨٥٨.٩٣٣.٤٩	٠.٧١٤١٧٩٤٢٦
store	١.٢٤٢.٧٧٨.٠٦٣	٢١١.٢٧٢.٧٧٠.٧١	٠.٨٨٨٣٠٣٦٤١
Guard	١.٩٤٩.٧٢١.١٩٢	٣٣١.٤٥٢.٦٠٢.٦٤	١.٣٩٣٦٠٧١٨١
Medical records / quality	٤٢٦.٠٢٤.٢٨٦	٧٢.٤٢٤.١٢٨.٦٢	٠.٣٠٤٥١٠٤٦٤
Telecommunications	٩٢.٣٤٢.٣٥١	١٥.٦٩٨.١٩٩.٦٧	٠.٠٦٦٠٠٣٧٧٧
Support activity Center	Costs	Amount divided into normal delivery	Share of Natural delivery department
Female services	٢.٥٥٠.٢٥٤.٧٠٨	٤٣٣.٥٤٣.٣٠٠.٣٦	١.٨٢٢٨٥٢٠٥٢
Male services	٧٩٩.٨٣٩.٤٥١	١٣٥.٩٧٢.٧٠٦.٦٧	٠.٥٧
Lunch	٦.٩٢٢.٦٧٦.٩٨٨	١.١٧٦.٨٥٥.٠٨٧.٩٦	٤.٩٤٨١٣٩٤٥٩
Kitchen	١.٥٩٨.٩٠٥.٩٦٨	٢٧١.٨١٤.٠١٤.٥٦	١.١٤٢٨٥٤٠٩
Transportation	٥٠٥.٨٣٣.١٨٤	٨٥.٩٨٩.٩٤١.٢٨	٠.٣٦١٥٤٨٥٢٥
Tailor House / Mailing	٨٤.٨٠٥.٦٤٤	١٤.٤١٦.٩٥٩.٤٨	٠.٠٦٠٦١٦٧٤٦
Static archive	١٧٤.٥٦.٠٠١	٢.٩٦٧.٥٢٠.١٧	٠.٠١٢٤٧٧٠٧
Procurement	٤٠.٧٥٦.٨٣٣	٦.٩٢٨.٦٦١.٦١	٠.٠٢٩١٣١٨٦٥
Equipment	٣٦.٤٨٢.٥٨٥	٦.٢٠٢.٠٣٩.٤٥	٠.٠٢٦٠٧٦٧٥

Table ٥: Apportioning Diagnostic-Operational Cost in the Niknafs Maternity Hospital of Rafsanjan to the Activity Center of Labor Ward in ٢٠١٧

Diagram ٥: Percentage of the Cost of the Labor Ward in the Niknafs Maternity Hospital by Cost Category



Apportioning the costs of the support center to the diagnostic and operational activities centers: The cost sharing method is a one-way method, with the share of the natural part of the maternity ward of the support centers, based on the sharing basis defined in Table ٢ and ٤. The method used in cost sharing was a one-way method; first, the relationship between the support centers with the diagnostic and operational activities was identified. After identifying the relationship between the support centers with the operational and diagnostic centers, the relationships were presented in percentages and in quantitative terms on the basis of the sharing. And the share of each of the diagnostic and operational activity centers was determined. As shown in Table ٤, the amount distributed to the normal delivery part of the support centers is ٥٤٥,٤١٦,٨٤٤,٨٢٧ Rials, which is derived from the sum of the amounts received from each of the support centers.

After the costs of the support centers were shared by the operational and diagnostic centers, the cost was allocated to the diagnostic activities of the centers according to the volume of service to the

operational centers. At first, the link between the diagnostic activities of the centers of activity with the operational centers was determined and then by determining the table of the ratio of the operational centers from the diagnostic activities centers, the share of each operational center was determined.

Table ٥ shows that among the operating centers of the labor block with ٣٨,٩٧٪ of the cost divided in the normal labor ward for ٩,٢٧٠,٦٨٩,٥١١,٧٥ Rials and among the diagnostic laboratories of the laboratory with ٢,٥٠٪ of the cost of the division of labor for the amount of ٥٩٥,٢٥٦,٦٨٧,٥٩ Rials accounted for the largest share of the total cost of ١٨,٩٦٢,٩٨٥,١١٣,٠٧ The percentage of the cost in the labor ward of Niknafs maternity hospital by cost categories in ٢٠١٧ is described in Diagram ٢.

Discussion and Conclusion

Research findings indicated that the total cost of labor ward services was estimated to be ٢٧,٢٦٪ of the maternity costs. ٨٧,٠٩٪ of the total cost of the normal labor sector was direct costs, with the majority of it accounting for ٦٥,١٤٪ of the cost of employee compensation, and ٩٤,٩٪ of the expenses were indirect overhead costs (١٩,٤٥٪ and diagnostic ٩٤. ٢), ١٢,١١٪ of direct costs included ٠,٩٨٪ depreciation of buildings and equipment and equipment, ١١,٦٣٪ of expenses related to materials and consumables and ٠,٢٥٪ related to energy costs.

The results of the study by Mahmoudi et al. showed that the cost of services in the cardiac care unit of Emam Reza Hospital in Bojnourd was equal to ٤١٣,٢٦٥,٦٧٧,١٩ Rials, equivalent to ٨,٦٦٪ of hospital costs, which was ١,٦٥٪ of the costs related to the cost of compensation Staff served (Mahmoudi & Ghahraman., ٢٠١٥). In the study of Jahani et al., the cost of hospital care services is equal to ١٨٠٠٦٥٨٣٦٧٧ Rials, equivalent to ٣٨,٨٪ of hospital costs, with the highest proportion of ٦٤,١٪ (Najafzadeh ,٢٠١٧), Moerer et al., as for the cost of ICU ٥١ patients in Germany, the majority of the department's expenses with more than ٦٢٪ (Moerer et al.,٢٠٠٧), Moinuddin et al. studied the cost of CCU in one of the first class public hospitals in Iran of ٥٥,٧٪ (Moeinoddin et al. ,٢٠١٥), and Nouri et al. reviewed the cost of the final activity centers of one of the armed forces hospitals, ٦١٪ (Noori, Goudarzi & Meshkani ,٢٠١٦), Biranvand et al. in calculating the cost of the services of the

physiotherapy department of the hospital Naha Tehran, ٤٨,٨٪ (Beyranvand et al. ,٢٠١٦), Mabasheri et al., in calculating the cost of services provided in Ayatollah Kashani Shahr-e-Kord Hospital, had the highest share of costs with ٨٦,١٪ (Mobasheri, Rafiee ,٢٠١٤), Mehrolhassani et al. reported that the cost of the clinical laboratory of Kerman's Shafa Hospital was ٧٤,٢٪ (Mehrolhasani, Rahimi & Emami ,٢٠١٤), and French et al. reported value-based care and cost categories, accounting for ٧٩٪ of the costs related to human resource.

According to the World Health Organization (WHO) in the health sector, about two thirds of the costs are spent on human resources and, according to international standards, human resources costs account for about ٥٥ to ٦٥ percent of the total operating costs of the hospital (Rezapour et al., ٢٠١٢). The results of the mentioned research with the difference of more than ٠,٩٩٪ and less than ٣٨,٢٩٪ is almost consistent with the result of this research.

As observed, the cost of human resources has the highest cost per section in all researches, which part of the research results can be influenced by policies of the Ministry of Health and Medical Education at different times. Therefore, human resources play a significant role in economy of the hospital. The results of Mahmoudi et al., ٨,١٪ (١٣), Jahani et al., ٢٨,٦٪ (٣٦), Rezapour et al., ٢,٩٪ (٢١), Shariati et al., ٣,٨%, Rezapour et al., In head-to-head analysis The focal points for the final services of thalassemic centers were chemotherapy ٥٨,٢٪, infants ٩٩,١٪, children ١٣,٢٪, pediatrics ٢ ٤١,١٪, and for surgery ٩٤,٩٪ (٢١), Hadian et al. % (٢٠), Khani et al. In their research related to the ICU section, ١١٪ (Khani, Ghane ,٢٠١٤), Javanbakht et al., in their research, used general consumables (٠,١٧٪) and proprietary (١١,٣٢٪) in total ٤٩ / ١١٪ (Javanbakht et al.,٢٠١٣), Namazi et al. account for ٢١,٧٪ of the total cost of the laboratory unit, and the cost of consumables for the imaging unit is ١٢,٤٪ (Namazi, Ghafari & Ebrahimzade km., ٢٠١٣), calculated the cost of materials and consumables for the total cost.

The results of the research with the difference were more than ١١,٢٢٪ and ٤٦,٥٧٪, respectively. According to the researchers, the dispersion of the findings can be due to the lack of proper model of consumption, inadequate and incomplete storage of consumables, the difference in the value of the

specific consumables of each activity center (in some centers of activity, such as the laboratory, the value of supplies and consumables are more expensive than radiology...) in different hospitals, as well as special policies for paying at any time are factors influencing this ratio.

The results of similar research showed that ۱۹,٤٪, Hadian et al ۲۱,٥٪ (Hadian rt al. ,۲۰۰۹), Javanbakht et al. (۲۷,٥٪) (Javanbakht et al., ۲۰۱۳), Mahmoudi et al (۲۸,٦), Jahani (۲۸,٦٪) (Najafzadeh ,۲۰۱۷) of the costs were related to overhead costs, which is roughly in line with this research, and the results of the above mentioned research were more than ۲,٤٥ and less than ٦,٦٦. According to researchers, this dispute with other studies may be due to different apportionment of support and diagnostic activity centers, or costing methods.

In the studies conducted by Nasiripour et al. ٥٪ (Nasiripoor, Maleki & Nourozi, ۲۰۱۰), Mahmoudi et al., ۷,٥٪ (Mahmoudi & Ghahraman, ۲۰۱٥), Jahani et al., ٤,۱٪ (Najafzadeh, ۲۰۱۷) of expenses have been calculated for the cost of consuming energy. The differences in the results are due to different research environments, which is ۰,۲٥ percent in this study, because some diseases and experiments require special tools that cost a lot and have significant effect on the ratios of other costs. The ideal cost of energy is ٥٪ of the total cost in the hospital (Karabatsou et al., ۲۰۱٦). This ratio of cost with the proposed standard is in an optimal situation.

According to the emphasis of policy makers and health planners, the health transformation project aims to protect people financially, create equity in access to health services and improve the quality of hospital services in the country. Implementing the health transformation project on the condition of developing sustainable financial resources, while increasing the satisfaction of patients from services in public hospitals, can improve the quality of health services (Mahmoudi & Ghahraman,۲۰۱٥) and, with the optimal use of staff and resources in order to increase productivity and provide more services, the average cost of the other sectors is reduced, and the cost of services is reduced, and this depends on conducting studies and accurate estimates of costs.

Research limitations include a shortage or lack of available scientific resources in the field of activity-based costing in maternity hospital and labor ward, and the lack of a system for recording and storing cost information and statistics, and the lack of a system for cost and statistic information registration and maintenance system and lack of required information and non-systematic information supply flow which needs to spend a lot of time with people who are experienced in the relevant activity centers to distinguish between recorded non-systematic costs or incomplete statistics. Considering that information for the cost calculation is collected from different parts of the hospital, an integrated maternity information system is required at the maternity hospital.

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