

CHAPTER 5

DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Conclusion and Discussion

1) Overview of six clinics

From table 5, figure 12 and 13, the research found that total cost of OPD services were 2,916,285.96 baht and unit cost of OPD service was 216.17 baht. Comparison between unit cost study of Manorom District Hospital using Activity-Based Costing technique and unit cost of other district hospital, the research found that unit cost was closely estimate, such as unit cost of OPD of Community Hospital in Chanturi province is 226.15 baht (Kanokwongnuwat, 2002) and unit cost of OPD of Ubonrat District Hospital in Ubonratchathanee province is 242 baht (Pittayarungsarit et al., 1996).

From table 14, figure 26 and 27, considering only operating cost including labor cost and material cost, the research found that total cost of OPD services were 2,414,377.35 baht and unit cost of OPD service was 178.96 baht, whereas other unit cost study that studying in 16 district is equal to 119 baht (Kongsawat, 1997)

Considering each clinic in OPD, this research found that the highest total cost is General Patient Clinic (75.24 %) because this clinic provided service everyday (Monday – Friday), then it provided more services (11,911) and health personal of OPD used more time in order to provide service than others as well. If this clinic used more time in order to provide services, then this clinic consumed more resource. Considering only operating cost, the highest total cost still were General Patient clinic (76.28 %), Hypertension Patient Clinic and Diabetes Mellitus Patient Clinic, respectively.

Considering each clinic in OPD, Anxiety Relaxation Clinic had highest unit cost (1,017.93 baht/visit) because this clinic provided less service (only 5) than other

clinics, then this clinic had highest cost. The other reason was capital cost of this clinic was higher (compare between this clinic and Drug Addiction Patient clinic) than drug addiction clinic.

Then, hospital administrator team should review the necessity to provide the Anxiety Relaxation Clinic in Outpatient Department.

However, considering only operating cost from table 14, Diabetes Mellitus Patient clinic had highest unit cost (448.50 baht/visit) because, when compare other high total cost clinics (such as General Patient Clinic and Hypertension Patient Clinic), this clinic provides less services (575) than those clinics. Then unit cost of Diabetes Mellitus was highest unit cost than those clinics.

2) Detail of each clinic

The total cost and unit cost of each activity from Activity-Based Costing technique could help hospital administrator to understand process performance in term of cost of process. If any activities are high cost, then hospital administrator can use any policy or method to control those high cost areas.

2.1) General Patient Clinic

From table 6, figure 14 and 15, the research found that Pharmacy Dispensation had highest percentage of total cost was (33.21%) because this activity consumed higher material cost especially drug cost (356,232.98 baht) than the others. Other reason was this research used time as criteria (or resource driver) to allocate indirect cost of OPD to each activity, it mean that if any activities used more time to operate then those activities should consumed more resources or had high cost, as Pharmacy Dispensation used time equal to 21.50 percent (see appendix 3) of all activities in six clinic. Then, Pharmacy Dispensation should consume more resource or had highest total cost. From observation of researcher, I found that most of time in Pharmacy Dispensation activities was the waiting time of patient such as wait for pharmacist dispensation. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of patient for any activities.**

As mention about total cost, Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug utilization, if physicians would like to use any expensive drug, then they have to be approved from physician committee.

Considering medical record and patient screening activity, the research found that these activities had quite high cost (10.15 % and 24.22 % respectively) because this research used the operating time as allocation criteria indirect cost of OPD to these activity, whereas both activity consumed more time (14.54%, 24.60% respectively) . From observation of researcher, I found that most of time in these activities was the waiting time of patient such as wait for physician, wait for OPD card, or wait for screening, etc. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of patient for any activities.**

From table 6, considering unit cost of each service, the activity that had highest unit cost is Radiology activity (1,221.74 baht/visit) because this activity provided less number of services (only 224 times for Radiology activity) than other service activities (e.g. Diagnosis and Treatment or Medical Record activity). When, considering the capital cost of Radiology activity, this research also found that this activity had quite high cost (175,491.36 baht), than the other and then this activity had highest unit cost.

However, considering only Operation Cost (table 15), activity that had highest unit cost is Quality Improvement activity (439.55 baht) and Internal Conference activity (439.55 baht) because these activities had less activities (only 3 for Quality Improvement and 10 for Internal Conference activity). Other reason was almost of OPD member had to participate in these supportive activities, then this activity consumed more operating time (0.08 % and 0.25 % respectively) than other activities (when, compare with other supportive activities e.g. personal evaluation (0.00061 %) or medical equipment preparation (0.03741%)).

Considering radiology activity, this research founded that this activity almost equal to highest unit cost (although this research do not consider capital cost) but

Radiology activity had labor cost and material cost more than Quality Improvement activity and Internal Conference activity, then this activity was high unit cost.

2.2) Hypertension Patient Clinic

From table 7, figure 16 and 17, the research found that Pharmacy Dispensation had highest percentage of total cost (48.22%) because this activity consumed higher material cost especially drug cost (77,963.22 baht) than the others. Other reason was this research used operating time as criteria (or resource driver) to allocate indirect cost of OPD to each activity, it mean that if any activities used more time to operate, then those activities should consume more resources or had high cost, as Pharmacy Dispensation used time equal to 3.80 percent (see appendix 3) of all activities in six clinic then Pharmacy Dispensation should consume more resource or had highest total cost. From observation of researcher, I found that most of time in this activity was the waiting time of patient such as wait for pharmacist dispensation. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of patient for any activities.**

From table 16, even though this research did not consider capital cost, but Pharmacy Dispensation still had highest percentage of total cost (47.23%).

Then, Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug utilization, if physicians would like to use any expensive drug, then they have to be approved from physician committee.

Considering patient screening activity, the research found that this activity had quite high cost because this research used the operating time as allocation criteria (or research driver) to allocate indirect cost of OPD to these activity, whereas this activity consumed more time (4.19% compare with six clinics). From observation of researcher, I found that most of time in these activities was the waiting time of patient such as wait for physician, wait for screening, etc. **If hospital administrators would**

like to minimize cost of these activities, then they should reduce the waiting time of patient for any activities.

From table 7, considering unit cost of each service, result demonstrated that supportive activities including Quality Improvement activity and Training activity had highest Unit Cost (468.55 baht/1 conference and 468.55 baht/1 conference respectively) because these supportive activities had less number of activities (only 3 for Quality Improvement activity and 1 for Training activity), then these activities were highest unit cost.

From table 16, even though this research did not consider capital cost, but activity that had highest unit cost still is Quality Improvement activity (439.55 baht) and Training activity (439.55 baht).

2.3) Diabetes Mellitus Patient Clinic

From table 8, figure 18 and 19, the research found that activity that Laboratories Diagnosis activity had highest percentage of total cost (41.58%), because this activity used more operating time than other activities (3.85% of all activities in 6 clinics or 101.38 minute/1 visit), and this activity also had highest capital cost. Then, this activity should consume more resource or higher cost than others.

From table 17, when considering only Operation Cost including Labor Cost and Material Cost, the result demonstrated that activity that had highest total cost is Pharmacy Dispensation (47.82 %) because this activity had highest, especially drug cost.

If hospital administrator would like to reduce or control these cost, then it is quite difficult because most of the Laboratories activities time is investigation time that this activity already have standard time to operate. But, they can increase operating day of Diabetes Mellitus Clinic is 2 day because they can reduce cumulative waiting time of each patient.

Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug

utilization, if physicians would like to use any expensive drug, then they have to be approved from physician committee.

From table 8, considering unit cost of each service, result demonstrated that activity that has highest unit cost are supportive activities including Quality Improvement activity (468.55 baht/1 conference) and Training activity (468.55 baht/1 conference) because these supportive activities had less number of activities (only 4 for Quality Improvement activity and 1 for Training activity), then these activities had highest unit cost.

From table 17, even though this research did not consider capital cost, but activity that had highest percentage of total cost still was supportive activities including Quality Improvement activity (439.55 baht/1 conference) and Training activity (439.55 baht/1 conference).

2.4 Drug Addiction Patient Clinic

From table 9, figure 20 and 21, the research found that activity that Diagnosis and Treatment had highest percentage of total cost is (26.77%) because this activity used more time to provide services (average 64.24 minutes per 1 visit) than other activities (see appendix 3) in Drug Addiction Patient Clinic. Otherwise, to compare with other activities, this activity had also high labor cost (420.50 baht). Then, Diagnosis and Treatment activity should consumed more resources or higher total cost than other activities.

From table 19, even though this research did not consider capital cost, but activity that had highest percentage of total cost still is Diagnosis/Treatment (28.06 %),

If hospital administrator would like to reduce or control these cost, then it was quite difficult because most of the diagnosis and treatment time is patient counseling that this activity need more time to operate activity.

From table 9, considering unit cost of each service, result demonstrated that Diagnosis and Treatment had highest unit cost is (28.61 baht/ 1 visit). From table 18,

even though this research did not consider capital cost, but activity that is highest unit cost still was Diagnosis/Treatment (28.66 baht/ 1 visit).

If hospital administrator would like to reduce unit cost of Diagnosis and treatment activity, then they should increase demand for services or increase number of services.

2.5) Anxiety Relaxation Clinic

From table 10, figure 22 and 23, the research found that Diagnosis and Treatment had highest percentage of total cost is (64.62%) because this activity used more time to provide services (average 33.36 minutes per 1 visit) than other activities (see appendix 3) in Anxiety Relaxation Clinic. Otherwise, to compare with other activities in this clinic, this activity had also high capital cost (3,076.74 baht), then Diagnosis and Treatment activity should consumed more resources or higher total cost than other activities.

From table 19, when considering only operating cost including labor cost and material cost, the result demonstrated that activity that had highest total cost is Medical Equipment Requisition (38.47%) because Medical Equipment Requisition and Medical Equipment Preparation have number of activities more than services activities, then these activities had high total cost.

Like Drug Addiction Patient clinic, if hospital administrator would like to reduce or control these cost, then it is quite difficult because most of the diagnosis and treatment time was standard of anxiety relaxation process that we can not reduce operating time.

From table 10, considering unit cost of each service, the result demonstrated Diagnosis and Treatment activity had highest unit cost (657.75 baht/ 1 visit) because, when compare with other activities in this clinic, this activity provided less number of services (only 5), and had high cost especially capital cost of this clinic activity (3,076.74 baht).

From table 19, even though this research did not consider capital cost, but Diagnosis and Treatment activity still had highest unit cost (42.40 baht).

If hospital administrator would like to reduce or control these cost, there are 2 alternatives to solve this problem 1) review necessity to provide this service in OPD clinic because this clinic have only 5 visit but they use labor cost more than other service activity. Second, in marketing perspective, this clinic like health promotion clinic, then hospital administrator should increase demand of patient or normal people to visit this clinic and then they can reduce the cost of this clinic in finally.

2.6) Acupuncture Clinic

From table 11, figure 24 and 25, the research found that Diagnosis and Treatment activity had highest percentage of total cost is (89.30%) because this activity used more time to provide services (average 23.36 minutes per 1 visit) than other activities (see appendix 3) in Acupuncture Clinic. Otherwise, to compare with other activities in this clinic, this activity had also high capital cost (37,458.12 baht). Then, Diagnosis and Treatment activity should consume more resources or had higher total cost than other activities.

From table 20, even though this research did not consider capital cost, but activity that had highest percentage of total cost still was Diagnosis/Treatment (80.44 %).

From table 10, considering unit cost of each service, result demonstrated that Diagnosis and Treatment had highest unit cost (264.50 baht/ 1 visit) because, when compare with other activities, this activity provided less number of services (only 257) than others, and had high cost especially capital cost of this clinic activity (37,458.12 baht). From table 20, even though this research did not consider capital cost, but activity that has highest unit cost still is Diagnosis and Treatment (118.75 baht/ 1 visit).

If hospital administrator would like to reduce or control these cost, then, in marketing perspective, they should increase demand of patient or normal people to visit this clinic and then they can reduce the cost of this clinic in finally.

3) Comparison unit cost of some service activity in 6 clinics

From table 13, 22, 23, I selected any activities to compare unit cost of those activities in 6 clinics based on similarity of each activity in 6 clinics (it mean that those selected activities had same step, same method and used same resource to operate activities, in the other word, severity of diseases or type of services did not have any effect on those selected activities).

However, because of this research used operating time as allocation criteria (or resource driver) to allocate indirect cost to any activity, if any activities used more operating time than others, then those activities should have high cost. If any activities had high unit cost, then one cause of high unit cost should came from those activities used more operating time than other activities.

This information from Activity-Based Costing technique help hospital administrator to detect high cost activities (comparison in 6 clinics) and hospital administrator can set any policy or any method to tackle those high cost activities.

3.1) Medical record activity in Diabetes Mellitus clinic had highest unit cost, because, comparison between this clinic and other, this clinic used more operating time (and also less number of service) than other activity (although this activity should not difference in 6 clinics). From observation of researcher, I found that most of operating time in these activities was the waiting time of OPD searching at shelf and waiting time of OPD registering in computer software. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of those activities such as reduce time for OPD searching, reduce time for OPD registering to computer or redesign the operating process.**

3.2) Patient Screening activity in Hypertension Patient clinic had highest unit cost because, comparison between this clinic and other, this clinic used more operating

time (and also less number of service) than other activity (although this activity should not difference in 6 clinics). From observation of researcher, I found that most of operating time in these activities was the waiting time e.g. wait for patient screening or wait for physician. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of those activities such as reduce waiting time for patient screening and meet physician by increasing operating day of clinic from 1 day/week to 2 days/week or shifting any patient to afternoon clinic.**

3.3) Pharmacy Dispensation activity in Diabetes Mellitus Patient clinic had highest unit cost, because, comparison between this clinic and other, this clinic used more operating time (and also less number of services) than other activity (although this activity should not difference in 6 clinics). From observation of researcher, I found that most of operating time in these activities was the waiting time for pharmacist dispensing. **If hospital administrators would like to minimize cost of these activities, then they should reduce the waiting time of this activity such as reduce waiting time in pre-drug dispensing process.**

3.5) For Diagnosis/Treatment and Laboratories activity, it was very difficult to reduce the operating time because these activities have any standard investigate time, for example, Fasting Blood Sugar test in Diabetes Mellitus clinic had to use 101.38 minute/ 1 test. Then hospital administrator should use alternative way to reduce the cost, e.g. review resource utilization, etc.

5.2 Policy Implications

5.2.1 Hospital administrator team should review the necessity to provide the Anxiety Relaxation Clinic in Outpatient Department.

5.2.2 In General Patient clinic, the method to reduce cost or control cost as follows:

1) Hospital administrators should reduce the waiting time of patient in Medical Record, Patient Screening and Pharmacy Dispensation activities.

2) Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug utilization, if physicians would like to use any expensive drug, then they have to be approved from physician committee.

5.2.3 In Hypertension Patient clinic, the method to reduce cost or control cost as follows:

1) Hospital administrators should reduce the waiting time of patient in Patient Screening and Pharmacy Dispensation activities.

2) Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug utilization, if physicians would like to use any expensive drug, then they have to be approved from physician committee.

5.2.4 In Diabetes Mellitus clinic, the method to reduce cost or control cost as follows:

1) If hospital administrator would like to reduce or control these cost, then it is quite difficult because most of the Laboratories activities time is investigation time that this activity already have standard time to operate. But, they can increase operating day of Diabetes Mellitus Clinic is 2 day because they can reduce cumulative waiting time of each patient.

2) Hospital administrator should review and set any policy to control the drug and medical supplies utilization e.g. setup the policy about expensive drug utilization,

if physicians would like to use any expensive drug, then they have to be approved from physician committee.

5.2.5 Drug Addiction Patient clinic

If hospital administrator would like to reduce unit cost of Diagnosis and treatment activity, then they should increase demand for services or increase number of services.

5.2.6 Anxiety Relaxation Clinic, the method to reduce cost or control cost as follows:

1) Revision necessity to provide this service in OPD clinic because this clinic has only 5 visit but they use labor cost more than other service activity.

2) In marketing perspective, this clinic like health promotion clinic, then hospital administrator should increase demand of patient or normal people to visit this clinic and then they can reduce the cost of this clinic in finally.

5.2.7 Acupuncture Clinic

If hospital administrator would like to reduce or control these cost, then, in marketing perspective, they should increase demand of patient or normal people to visit this clinic and then they can reduce the cost of this clinic in finally.

5.2.8 Cost of activities is only one performance indicator to indicate achievement of process improvement. The lowest cost of activities, it does not mean that this activity should have high quality or good performance. If hospital administrator would like to improve new internal process of clinic, then they need other performance indicator including quality and operating time of new process to indicate achievement of new process as well.

5.3 Practical Advantage of Activity-Based Costing technique

5.3.1 Activity-Based Costing allows an in-depth product analysis by explaining the relationship between the products and activities,

For example, in General clinic, Activity-Based Costing can demonstrated that medical record and patient screening activity have quite high cost activities because this research use the operating time as allocation criteria to allocate indirect cost of OPD to these activity, whereas both activity consume more time (14.54%, 24.60% respectively) . Most of operating time, is the waiting time of patient such as wait for physician, wait for OPD card, or wait for screening, etc. **If hospital administrators would like to minimize cost of these activities, from Activity-Based Costing analysis, then they can use this analysis to reduce the waiting time of patient for any activities.**

In, traditional costing analysis provide only cost data e.g. cost of General Patient Clinic that have less implication in internal process improvement.

5.3.2 Activity-Based Costing analysis will enable organization to obtain process cost measurement

If hospital administration committee would like to improve internal process, then they need performance indicator including cost, quality and time of the new process to indicate improved process is good or not. Activity-Based Costing analysis will provide cost of improved process on whether the goals of these improvement programs are being achieved

5.3.3 Hospital administration committee can obtain more accurate costs for services delivered.

Hospital administration committee could use costs generated from an Activity-Based Costing system for a variety of business objectives. For example, to know:

- 1) Where to look for cost savings
- 2) How service/activities processes can be modified to increase efficiency
- 3) Why one services or activities spends more or less than another

4) For contract negotiations, the relationship between the amount reimbursed by various payers and the cost of providing the medical service

Business decisions will be made based on current cost and reimbursement levels. If the costs exceed reimbursement levels, many hospital administration committee may choose not to offer certain services, which may reduce access to care for many people.

5.4 Limitations

5.4.1 This research used data only 5 months because, before May 2003, OPD had a few patients because most of patients go to Primary Care Unit in hospital. After May 2003, hospital committee decided to close Primary Care Unit then most of patient comes back to OPD again. Then, data may can not represent all of fiscal year.

5.4.2 This research use only operating time as allocation criteria (or resource driver) to allocate indirect cost to each activity, whereas in reality, severity of disease should be important allocation criteria or resource driver to allocate indirect cost to activities. The reason that use only operating time as resource driver, are this research has limited time (only 1 month) to gather and analyze data and the expert (physician) do not have time to help researcher to identify severity of disease.

5.4.3 Cost of activity could vary follow severity of disease, it means that if disease is more severity or more complicate, then cost of treatment or drug will higher than low disease severity. This research assumed that severity of disease in community hospital was same; then, severity of disease did not have any effect on cost of activities. But, in reality or in Tertiary hospital, further studies should consider in severity of disease as well.

5.4.4 Activity of each service could vary follow severity of disease as well, for example, normal hypertension patient and hypertension patient with Chronic Obstructive Pulmonary Disease (COPD), they are same type of hypertension patient by difference in severity. Hypertension patient with Chronic Obstructive Pulmonary

Disease (COPD) should have more treatment activity than normal hypertension patient. Further studies should consider in severity of disease as well.

5.5 Further Studies

5.5.1 Further studies will study all department of hospital, for example, in-patient department, dental department, emergency department because hospital manager can obtain cost of all process in all department and to bring about process improvement such as reduce the time in any process, review necessity to do any activity that has high cost.

5.5.2 Further studies will select any healthcare program or treatment that has high cost and study the cost-effectiveness of program using Activity-Based Costing technique.

5.5 Recommendations

1) Any study should study all department of hospital, for example, in-patient department, dental department, emergency department because hospital manager can obtain cost of all process in all department and to bring about process improvement such as reduce the time in any process, review necessity to do any activity that has high cost.

2) Further studies should study all of fiscal year because hospital manager can obtain more complete, accurate data.

3) This research study in Community Hospital that have overlap activities less than Tertiary Hospital or Medical School Hospital, if further studies would like to use Activity-Based Costing technique to study cost analysis then further studies need to clearly define about product, main activities and detailed activities. In addition to clearly define product and activities, the one key success factor of Activity-Based Costing technique is, further studies have to gather activity driver accurately.