



## Time-Driven Activity Based Costing of Speech Therapy in a Small-Scale Rehabilitation Clinic

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### Dear Editor-in-Chief

Unlike the ever-increasing need of the Iranian community for rehabilitation services (1), many of these services are out of the insurance coverage in Iran. This will make access to rehabilitation services more difficult for many poor groups and exacerbate the social cost of disability. Considering the advantages of Time-driven Activity Based Costing (TDABC) (2), the present study has used this framework to calculate the cost of speech therapy services at the Asma Rehabilitation Institute (ARI).

The data needed for this research includes personnel costs, depreciation cost for office equipment and medical equipment, rent cost and overhead costs, and observing the services process and informal interviewing the staff which collected in 2016.

First, the map of the speech therapy process was drawn up by observing the process of activities. The total cost of each resource group includes buildings, overheads, human resources, and equipment (including medical equipment and office equipment) were identified and the area oc-

cupied by department of speech therapy is considered as basis of cost sharing for the building, and maintenance of other assets. Then the practical capacity of each group (117390 minutes per year for staff and for equipment in terms of the useful life) calculated and the practical capacity of each group was considered as 85% of the theoretical capacity (3). Thereupon, the cost of each unit was obtained by dividing the total cost of each cost group to the practical capacity of them. One of the key milestones of the TDABC method is knowing the time required to receive the service by the patient at each step. This time was measured by observation and timing for four patients, and finally, time equations for speech therapy services were set. The final step on TDABC was aggregating the costs by multiplying the unit cost of each resource group in time equations. Speech therapy services are provided by a workforce with varying degrees of expertise. By placing the cost per minute for the rehab specialist (having a Ph.D in speech therapy) and putting the cost per minute of the rehab expert (with a



bachelor's or master degree in that field) in the time equations, the cost of high quality (HQ) services and medium quality (MQ) services acquired, respectively.

In order to estimate the average rehabilitation session for each patient, we have considered a regular 10-session course for this service. Given that the counseling and evaluation of the general

practitioner are provided only two times, so this item was counted only at the beginning and the end of a regular 10-session rehabilitation. The non-personnel costs were also admeasured according to the number of visits or area occupied by the department. The detailed results of cost categories are presented in Table 1.

**Table 1:** Average cost of a speech therapy session

| <i>Variable</i>   | <i>Time<br/>(Minutes)</i> | <i>Cost per minute (\$)</i> |      | <i>Cost (\$)</i> |       |
|---|---------------------------|-----------------------------|------|------------------|-------|
|   |                           | MQ                          | HQ   | MQ               | HQ    |
| Reception   | 15.2                      | 0.08                        | 0.08 | 1.15             | 1.15  |
| Counseling  | 28                        | 0.17                        | 0.17 | 4.90             | 4.90  |
| Speech therapy  | 313                       | 0.11                        | 0.18 | 33.37            | 54.80 |
| Evaluation  | 12                        | 0.17                        | 0.17 | 2.10             | 2.10  |
| Fee payment   | 13                        | 0.08                        | 0.08 | 1.10             | 1.10  |
| Total personnel cost of a regular 10-session speech therapy |                           |                             |      | 42.62            | 64.04 |
| Total non-personnel costs                                   |                           |                             |      | 29035.71         |       |
| Rent  |                           |                             |      | 8049.95          |       |
| Utilities   |                           |                             |      | 442.51           |       |
| Medical equipment depreciation                              |                           |                             |      | 134.76           |       |
| Office equipment depreciation                               |                           |                             |      | 324.54           |       |
| Outsourcing contract services                               |                           |                             |      | 3661.70          |       |
| Repair and Maintenance of equipment                         |                           |                             |      | 58.59            |       |
| Repair and maintenance of other assets                      |                           |                             |      | 5248.75          |       |
| Other overhead cost   |                           |                             |      | 11114.91         |       |
| Average non-personnel cost of a speech therapy session      |                           |                             |      | 13.03            |       |
| Average personnel cost of a speech therapy session          |                           |                             |      | 4.26             | 6.40  |
| Average cost of a speech therapy session                    |                           |                             |      | 17.29            | 19.43 |

The quantities in terms of the national currency, have been converted to USD using the average official exchange rate in 2016 (1 USD= 31,389 IRR)

The findings showed that the cost of speech therapy services was estimated at \$17.29 to \$19.43, taking into account the difference in the quality of service delivery. As revealed by results, human resource costs have contributed significantly to the cost of speech therapy. Surprisingly, a large share of "other overhead costs" reminds the importance of the production scale in the ARI. In other words, due to the low number of patients, overhead costs contributed significantly to the increase in the cost of speech therapy services. So, improving the marketing of the institution's service through promoting the patient re-

ferral links with larger healthcare centers, will significantly decrease the cost of speech therapy service.

Comparing the cost of speech therapy service with government's tariffs (\$7.01) showed that the cost of high quality and medium quality services for speech therapy was 2.47 and 2.77 times of the government's tariffs of these services, respectively. Given that government tariffs take into account the affordability of services rather than profitability, this gap is quite common (4).

## Conflict of interest

The authors declare that there is no conflict of interest.

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