2528-9705

Örgütsel Davranış Araştırmaları Dergisi
Journal Of Organizational Behavior Research
Cilt / Vol.: 3, Sayı / Is.: S2, Yıl/Year: 2018, Kod/ID: 81S2404

THE ANALYSIS OF COST-EFFECTIVENESS OF THE BOUGHT BOOKS BY THE CENTRAL LIBRARY OF KERMAN UNIVERSITY OF MEDICAL SCIENCES

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ABSTRACT

Academic libraries encounter some problems in acquisition such as space and budget deficiencies and that of publication increase. This necessitate the collections of academic libraries and information centers being evaluated with scientific methods. Cost-effectiveness is one of these evaluating ways. This study aimed to study the cost-effectiveness of printed Persian and Latin books bought by Central Library of Kerman University of Medical Sciences. Research population included 1219 and 333 books in Persian and Latin, respectively. This research was applied one and data collection way was a descriptive survey. The results showed that books in Orthopedics, English language and Literature were among the first 15 subjects during the period which had the least mean of cost-effectiveness, however. In other words, lower cost per use was paid for books in these subjects. The finding showed that the cost-effectiveness of books translated into Persian was lower than their English counterparts. Programming for appropriate assignment of budget and correct decisions for the future are of the most important benefit of evaluating cost-effectiveness of books in each subject.

Keywords: *Economic Evaluation, Cost-Effectiveness Analysis, Central Library of Kerman University of Medical Sciences.*

INTRODUCTION

Nowadays, everyone is aware of the value of information as a strategic commodity and source of power. As the main center of exchange of this valuable commodity, libraries are key and important components of various organizations (Shahrzadi, Babalhavaeji, AshrafiRizi, 2012). For instance, in an organization such as the university, university libraries are considered as the heart of this organization. These libraries are a place for the students and faculty members" research (Simmonds & Andaleeb, 2001), so one of the core and main activities of libraries is to provide information resources for research. One of the resources of information is the book (Azami et al., 2018). Academic libraries all over the world still pay specific attention to the provision of printed books besides considering other forms of information resources, as with the emergence of digital resources, printed books still have a critical role in libraries (Carr, 2007). These valuable sources still provide much of the information needs of students and library users in the medicine (Escotet-Espinoza et al., 2018).

Academic libraries face many challenges and issues regarding the collection process, of which the following can be cited. The volume of publications has grown to a degree that it is called

Geliş tarihi/Recieved: 02.03.2018 – Kabul tarihi/Accepted: 17.07.2018 – Yayın tarihi/Published: 21.12.2018

the "explosion of information". Along with this problem, the lack of financial resources of the libraries is also critical. Moreover, due to the annual increase of the price of information resources and other costs, budget cuts in libraries and information centers are significantly decreasing (Mohseni, 2007).

Furthermore, the incidence of economic crises and changes in users' information behavior in different subject areas call for the evaluation of libraries and information centers of universities (Chin Jiung-Bin and Wu Mu-Chen, 2014). Among many economic evaluation methods, cost-effectiveness analysis is a proper method for measuring and evaluating these collections because of considering different aspects of this complex, such as expenditures and the amount of use from the complex (Haseli, Naghshineh and Fahimnia, 2014). Effectiveness is a measure to evaluate the success of a system in meeting the goals and expectations from that organization. The cost-effectiveness analysis is a criterion to measure the ability to meet the goals from the costs perspective. In fact, this approach is reaching a specific product or service at the lowest possible cost (Shahrzadi, Babalhavaeji, AshrafiRizi, 2012).

Cost-effectiveness analysis in the libraries has many uses. By using this method, one can analyze the effectiveness of any kind of service provided in the libraries from training at the library to the use of various databases for data retrieval through standard methods (Hulme, 2006). Cost-effectiveness analysis is seen as an assistant tool for informing the financial decisions in libraries. Examining the cost-effectiveness of the complex, on the one hand, indicates the model of use in the selected subject areas by examining the resource use as an element of effectiveness, and, on the other hand, it modifies the collections or brings about the rectification of funding by calculating the costs of providing and disseminating information resources (Moradnejad, Sanaatjou, 2012).

Therefore, improper condition of economy and the limited budget of universities for providing academic books, on the other, and the high costs of books and their publishings and improvements, on the other hand, make the university librarians to evaluate the existing complexes. Meanwhile, the economic evaluations such as cost-effectiveness analysis would help library officials.

METHODOLOGY

The purpose of the current research was to evaluate the cost-effectiveness of Persian and Latin printed books that were purchased by the Central Library of Kerman University of Medical Sciences.

There are two methods available for calculating cost-effectiveness analysis: incremental cost-effectiveness ratio (ICER) and average cost-effectiveness ratio (ACER). ICER is defined as the ratio of cost difference to the difference in the effectiveness of the two strategies in competition. ACER estimates the average cost for each effect. It is clear that these two measures represent different parameters thus their goals of differ from each other. Using ACER, one can decide to maximize effectiveness based on a fixed budget, so ACER was used and considered in this study (Bang and Zhao, 2012).

The population of this study included Persian and Latin printed books buyers who purchased books from 2010 to 2013 by the Central Library of Kerman University of Medical Sciences. These books included 1219 Persian books and 333 Latin ones.

This study was applied with descriptive-survey data collection. A list of printed books purchased by Kerman University of Medical Sciences was prepared for the study. The list included both Persian and Latin printed books. Non-medical books were examined in the study as well, however, their focus was not merely on medical books. The information recorded for each book was title, subject area, price, frequency of use, and the book purchase year.

The statistics of the frequency of using books were extracted using the software used in the library i.e. Pars Azarakhsh software. In the software, the frequency of using the books was extracted by selecting the desired timeframe and using the possibility of reporting the borrowed books. It should be noted that each time of extension in this software is considered as borrowing the book. After collecting the stated data, they were entered into the Excel software for classification, analysis and calculation. For each book title, the cost-effectiveness was calculated individually according to the following formula:

$$\text{The effectiveness of each bok} = \frac{book\ price}{frequencu\ of\ use}$$

Then, the effectiveness of all books were calculated for each of the subject areas according to this formula.

RESULTS

Table 1 indicated the dispersion of the studied population. According to this table, among the examined books, 1219 were Persian books and 333 were Latin. The number of Persian books purchased in 2010 was 471, which was more than previous years. In 2011, fewer Persian books were purchased compared to other years which included 207 titles. As seen in the table, the number of Latin books purchased by the Central Library of the Kerman University of Medical Sciences each year has reduced compared to the previous years, so that the books purchased in 2013 were about one third of the books purchased in 2010.

Table 1: Dispersion of the studied population

Number of Latin books				Number of Persian books			
2013	2012	2011	2010	2013	2012	2011	2010
46	84	91	112	294	247	207	471
Total: 33				**Total: 1219**			

In Tables from 2 to 5, the average cost-effectiveness was given separately for the years under study. As the number of topics of the books examined was very high, about 70 subject areas, here only ten topics, the highest and the lowest average cost-effectiveness of each year were examined.

Table 1 indicated the average cost-effectiveness of books in 2010. The average cost-effectiveness for books on orthopedic subjects was the lowest, 1035 Riyals. This means that the Central Library of the Kerman University of Medical Sciences costs 1035 Riyals for each use of an orthopedic book. The books on the subject of oncology and literature were two other

subjects that had the least cost-effectiveness. Nanotechnology books had the highest average cost-effectiveness, and each use of a book on nanotechnology issues cost 5250000.

Table 2: ACER of the Books for 2010

Highest ACER		Lowest ACER	
ACER	Subject	ACER	Subject
175641.0256	General Hygiene	1035.616438	Orthopedics
226000	Physics	2310	Oncology
239079.1667	Rheumatology	2527.704712	Literature
302000	Bacteriology	2999.594649	Chemistry
339204.5455	General Medicine	3934.210526	Religion
513451.1914	Infectious diseases	4106.382979	English language
2085629.139	Anesthesiology	4376.805154	Mysticism
2450000	Family Planning	4895.959596	Embryology
5250000	Medical documents	5319.934979	Psychology
5250000	Nano technology	5420.454545	Ophthalmology

Table 3 revealed the average cost-effectiveness of books in 2011. As is seen in the table, in 2011 the oncology books had the least ACER. This was 2554 Riyals, which means that on average the cost per use of the books on subject area was 2554. Digestive and radiological systems` books ranked the second and third, respectively, regarding the lowest ACER levels. Anesthesiology books with the average cost of 30433333 Riyals per use had the highest average cost-effectiveness rate in 2011. Following this subject area, the veterinary and infectious diseases books had the highest average cost-effectiveness.

Table 3: Books ACER in 2011

Highest ACER		Lowest ACER	
ACER	Subject	ACER	Subject
186510.6979	Pathology	2554.83871	Oncology
280897.01	Skeletal system	4181.081081	Digestive system
363366.3366	General Medicine	4400	Radiology
383582.0896	Librarianship	4591.304348	Respiratory System
772277.2277	Dermatology	5625	Education
1306000	Mathematics	6331.491547	Anatomy
2000000	Computer	6536.923077	Embryology
3789320.388	Infectious diseases	6916.666667	English language
27000000	Veterinary	7101.176471	Chemistry
30433333.33	Anesthesiology	7978.191731	social Sciences

According to Table 4, the lowest average cost-effectiveness in 2012 was for traditional medicine and 5111 Riyals. In other words, per use of the books in this field, the Central Library of Kerman University of Medical Sciences exposed an average cost of 5111 Riyals. The average cost-effectiveness of books in areas of research methodology and literature was somehow the same. Anesthesiology, sports science and drugs were the three thematic areas with the highest average cost-effectiveness rate in 2012.

Table 4: Books ACER for 2012

Highest ACER		Lowest ACER	
ACER	Subject	ACER	Subject
175359.1505	Mycology	5111.111111	Traditional medicine
444117.6471	Hospital	8958.093041	Research Methodology
1004651.163	General Medicine	8985.005767	Literature
1426000	Oncology	9230.588235	English language
1500000	Computer	10618.36352	Psychology
6000000	Construction	12461.53846	Medical Physics
9150000	Infectious diseases	12521.73913	Science
9800000	Drugs	12678.27497	Physiology
59800000	Sport Sciences	13714.28571	Biotechnology
69760000	Anesthesiology	14580.89565	Pathology

Table 5 indicated the average cost-effectiveness of books in 2013. Orthopedics, epidemiology, and clinical medicine were subject areas with the lowest average cost-effectiveness. Although the books on oncology in 2010 and 2011 had lower average cost-effectiveness, the books related to this subject area in 2013 had the highest average cost-effectiveness. The cost per use of these books in this subject area was an average of 84,000,000 Riyals. The books of dentistry and biochemistry books had the highest average cost-effectiveness after oncology.

Table 5: Books ACER for 2013

Highest ACER		Lowest ACER	
ACER	Subject	ACER	Subject
636889.1989	Pharmacology	4633.333333	Orthopedic
757594.235	Religion	11066.66667	Epidemiology
1195614.286	Chemistry	20168.33333	Clinical Medicine
5600000	Hospital	14900	Management
7840000	drugs	15829.28773	Radiology
12530000	Traditional medicine	18365.17356	Nursing
19040000	General medicine	24106.89655	Science
32000000	Biophysics	25200	Research Methodology
48448000	Dentistry	26100	Literature
84000000	Oncology	27286.66667	Respiratory system

In Charts 1 to 4, the average cost-effectiveness of translated Persian versions and Latin equivalents were compared with each other.

As can be seen in Chart 1, the cost-effectiveness of books translated into Persian in 2010 (except the books of Schwarz Surgery and Histology of John Quiera) was less than their English versions, meaning that less fee was paid per use of translated books.

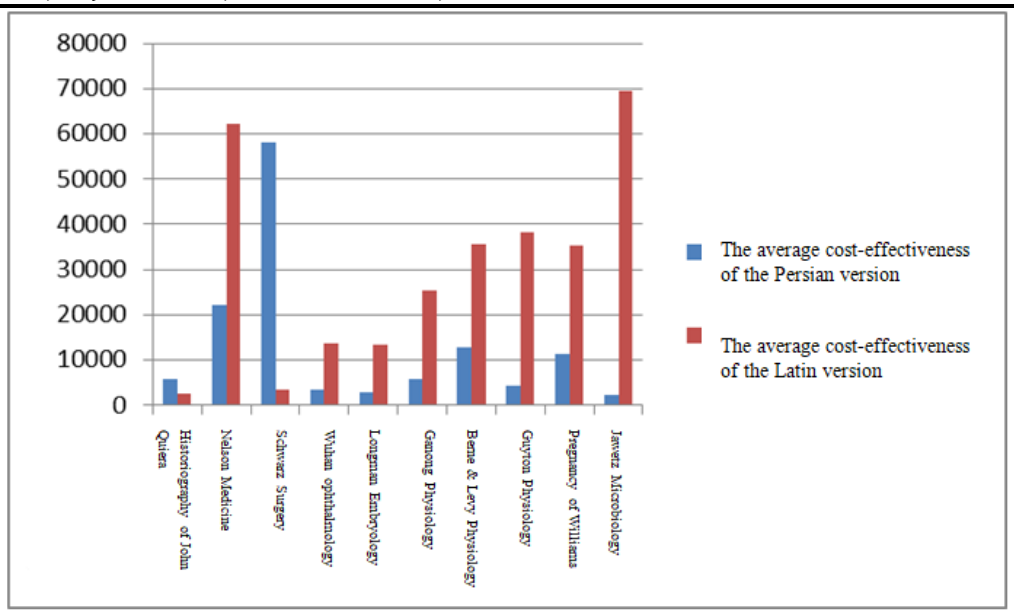

Chart 1: Comparison of the cost-effectiveness of the version translated into Persian and the equivalent in 2010

Chart 2 showed the comparison of cost-effectiveness of the version translated into Persian and the Latin equivalents of the books in 2011. Here, the cost-effectiveness of translated books was less than their English equivalent versions as well.

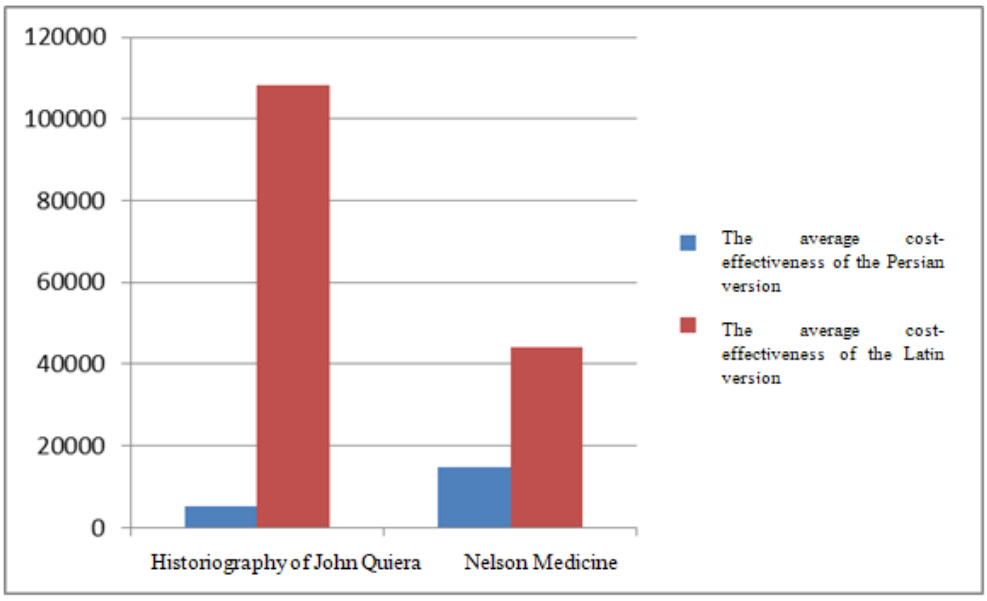

Chart 2: Comparison of cost-effectiveness of the version translated into Persian and the equivalent in 2011

Chart 3 also showed that the cost-effectiveness of books translated into Persian was less than the equivalent of English versions. In other words, each use of translated books was less expensive than the English versions.

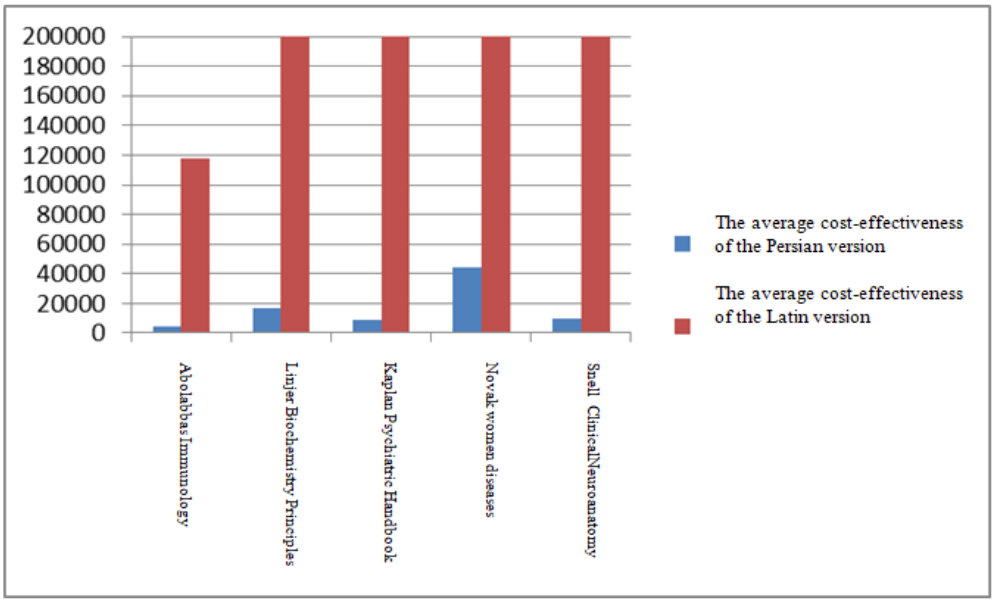

Chart 3: Comparison of the cost-effectiveness of the version translated into Persian and the equivalent in 2012

According to Chart 4, in 2013, as in previous years, the books translated into Persian (except for one case) had less cost-effectiveness compared to the equivalent English versions, which meant that the cost of using translated books at any one time was less than the cost per use of the equivalent English version.

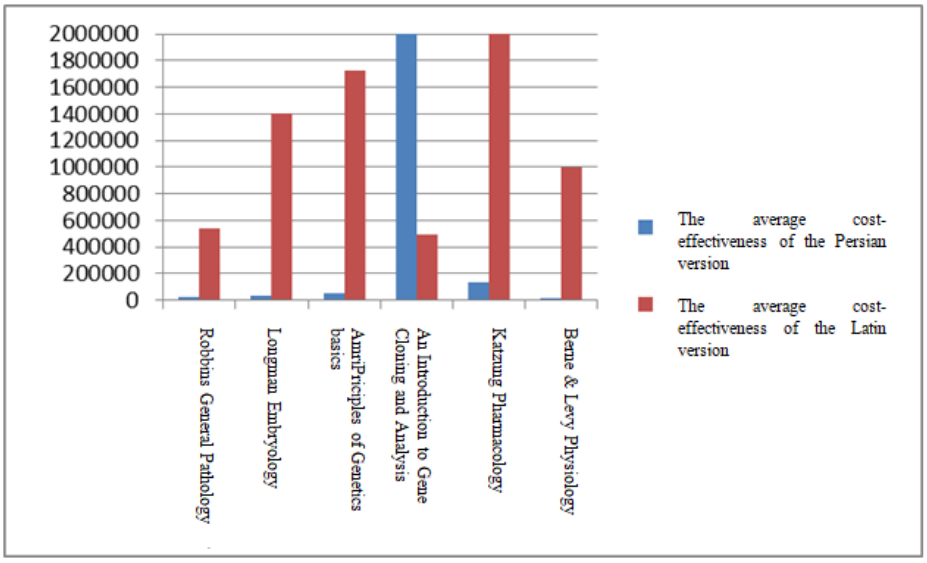

Chart 4: Comparison of the average cost-effectiveness of the version translated into Persian and the equivalent in 2013

DISCUSSION AND CONCLUSION

The purpose of the study was to analyze the cost-effectiveness of books purchased by the Central Library of Kerman University of Medical Sciences from 2010 to 2013. The study

focused on the topics of the books and conducted partially. In other words, instead of classification of books in broad subject areas, they were ranked according to the classification of the American National Library of Medicine (NLM) and the classification of the Library of Congress (LC) in different subject areas. However, Moradnejad and Sanatjou (2012) considered a broad category for the subject matter of books, so that the books were examined in the two broad areas of the human-social sciences and engineering. The results of the study indicated that human-social sciences had a greater cost-effectiveness than the technical engineering. In Haseli, Nagshineh, and Fahimnia (2014), the books were examined in a wide range of topics such as technical, basic sciences, social sciences and behavioral sciences and humanities.

A general examination of the books of different subject areas during the study period indicated that books on orthopedics, English language, and Literature were among the first 15 subject areas with the lowest average cost-effectiveness in all the years studied. In other words, per use of the books in the subject area mentioned was less costly compared to other subject areas.

Another aspect of the study was examining the cost-effectiveness of the same printed and English versions. The results indicated that the cost-effectiveness of books translated into Persian versus English equivalents was lower. This indicated that the use of books translated into Persian was greater than Latin books. In fact, the rate of use is one of the most important and effective factors in cost-effectiveness analysis. The results of Herati (2010), Moradnejad and Sanatjou (2012) indicated that the use of Latin books was less than other sources. The results of Kianpour et al. (2013) also confirmed that library users tended to use the translated version of medical books rather than the English version. Perhaps one of the reasons behind using Latin books less was the linguistic barrier. There is no doubt that the students were more likely to study a book easily and effortlessly, and did not turn to the English version unless they had to.

Any kind of evaluation in information systems can end in the best decisions in reaching the organization's goals, or modification of the previous decisions and policies, and selecting the best possible options ahead for serving users (Shahrzadi, Babalhavaeji, AshrafiRizi, 2013). Accordingly, the most important advantage of evaluating the cost-effectiveness of the books in each of the subject areas examined here was that it enabled us, on the one hand, to make the budget suitable for book purchase and resources in future purchases. On the other hand, finding less-used subject areas enabled us to increase the use of less resource-consuming resources by some strategies. For instance, one can hold exhibitions to encourage students and readers to read these books. Introducing these books by brochures, library websites, bulletin boards, and so on are other methods of attracting the attention of students and users to the less-used books. Finally, if some resources are not used, one can remove them from the set, so that unused and useless books not fill the physical spaces of the libraries.

References

Azami M, Khodabakhs S and Okhovati M (2018).Teleworking in health libraries: a survey of academic librarians' viewpoints. Journal of Biochemical Technology, 6(2); 365-371.

Bang, H. and Zhao, H. (2012). Average cost-effectiveness ratio with censored data.Biopharm stat. 22 (2), 401-415.

Carr, R. (2007). The academic research library in a decade of change. Oxford: Chandos publishing.

Escotet-Espinoza, M. S., Moghtadernejad, S., Scicolone, J., Wang, Y., Pereira, G., Schäfer, E., . . . Muzzio, F. J. (2018). Using a material property library to find surrogate materials for pharmaceutical process development. Powder Technology, 339, 659-676. doi:10.1016/j.powtec.2018.08.042

Hazli, Davood, Naqineh, Nader, Fahimnia, Fatemeh (2013). Comparing the use and cost-effectiveness analysis of English printed and electronic books in Tehran University. Quarterly Journal of Information Processing and Management. 29 (3), 685-709.

Herati, Hadi (2010). The study of the use of Latin books in lending departments of Ferdowsi University of Mashhad from 2003 to 2008. Master's thesis, Payame Noor University of Mashhad.

Hulme, C. (2006). Using cost effectiveness analysis; a beginner guide. Evidence based library and information practice, 1(4), 17-29.

Kianpour, Myth, Qani Dehkordi, Jalil and Salehi, Parvaneh (2013). The Study of the Use of Latin Books in the Central Library of Shahrekord University of Medical Sciences from 2006 to 2011. The Journal of Shahrekord University of Medical Sciences. 15, 25-31.

Ling-feng Hsieh, Chin Jiung-Bin and Wu Mu-Chen, (2014) Cost efficiency and service effectiveness for university e-libraries in Taiwan, The Electronic Library, Vol. 32 Issue: 3, pp.308-321.

Mohseni, Hamid (2007). Collection and delivery services. Tehran: Library Publisher.

Moradnezhad, Ali and Sanatjoo, Azam (2013). Cost analysis - the effectiveness of latin literature books and databases of all-text latin publications articles in Ferdowsi University of Mashhad in the fields of humanities, social and technical engineering in 2010. LIS Research, 3 (2), 209-232.

Shahrzadi, Layla, Baba Hawaeji, Fahimeh and Ashrafi Razi, Hassan (2013). Cost-benefit analysis: an indicator for the economic evaluation of libraries and information centers. Health Information Management, 10 (2), 123-134.

Simmonds, and Andaleeb, S. (2001).usage of academic libraries: the role of service quality, resources, and user characteristics. Library trends, 49 (4), 621- 634.