



# Statistical Analysis of Organizational Performance and Its Effects on the Income Levels: An Exploratory Study of the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques at Al Nahrain University

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**Abstract-** This article aims at focusing on the most important activities and services provided by “The Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques (HIDIART)” which is one of the establishments of Al Nahrain University that provides medical services to the infertile patients and hosts various different surgical procedures, in addition to its unique academic and research role by graduating a number of postgraduate students in scientific disciplines on the levels of higher diploma, Masters, and Doctorate. The article followed a statistical analysis and survey studies using the commercially available software package Statistical Package for the Social Sciences (SPSS) for sampling the data. Our main findings are first there is a linking and affection relation to the services provided by the institute to the community and the level of actual income, second there is a necessity in providing infrastructural resources like human, financial resources and experts in scientific fields. The last of our findings is that environmental factors has an effect on the levels of performance on organizations in general and especially on the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques.

**Keywords-** *Statistical Analysis, SPSS, Survey Study, Income Levels, Organization Management.*

## I. INTRODUCTION

Due to the decline of the government income it is necessary to reroute the focus not just on spending money but also on the methods of making money, that is by achieving its goals which are first achieving development goals – it is mandatory for the government to get fees from the benefiteres in exchange for the services provided by them so that it can face the responsibilities in certain fields that require governmental funding. This article aims to enlighten the actual work done by the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques and the main services provided to the community. To achieve the article goals we will provide the methodology in four sections as study structure, theoretical mainframe, experimental mainframe, and conclusions and recommendations.

## II. STUDY STRUCTURE

### A. Study aims

This article aims at enlightening the role of the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques in providing its services and overviewing the nature of these services. In addition, study the effects of the services on the level of the achieved financial income.

### B. Importance of the Study

It comes from several aspects including what the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques provided of services in the medical side which relies on the diagnosis and treatment of infertile patients. In addition to the academic side on the levels of higher diploma, Masters, and Doctorate and the research outcome specializing in infertility diagnosis and treatment.

### C. Data and information gathering tool

References from Arabic and English literature has been chosen to enrich the theoretical aspect. On the level of experimental aspect the article got the data from the financial unit of the Institute in addition to tables from the consultant clinic and operations which include data about incoming patients, in vitro fertilization and artificial insemination newborn numbers, and various surgical operations for all age categories not just the infertile patients. Furthermore, we covered the financial reports gained by the institute from the postgraduate students who study at their own expense.

### D. Research Timeline

The research took six years from 2013 to 2018 to get the necessary data for statistical analysis.

## III. THEORETICAL MAINFRAME

### A. General Mainframe about the Institute

#### 1) The Institute at glance

To overcome the suffering of a community section who are infertile and to provide a solution for the demanding increasing needs of the infertile patients, this solution meets the global standards in providing both diagnostics and treatment services especially that we are entering a new era of technological advancement which makes the medical services more efficient and to provide the specialized staff for management and keeping up with the latest developments in addition to the support of joining the higher studies which guarantees positions filling. All the previously mentions aims are what made the Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques which was established in 1990 to diagnose infertility and the assisted reproduction techniques as a treatment center which became in 2000 an academic, treatment, and research institute on the level of postgraduate studies at Baghdad University then it joined Al Nahrain University in 2005. The institute is currently located at al kadhimiya city, Baghdad, Iraq. And it has gained global recognition from FAIMER ECFMG one of the corporations of Directory PMED). It has been ranked in the top 41% institutes in the middle-east.

#### 2) *The law of the Institute*

A specific law was established by the Iraqi presidency, it states "Iraqi Presidency, Issue No. 21, according to the parliament and considering the first rule of section 61 and the 73<sup>rd</sup> bond of the Iraqi constitution in order from the Iraqi president dated 2011/8/21 [1], the following rule was established numbered 19 to the year 2009:

##### a) *First Bond*

- i. The Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques is to be established at the Iraqi ministry of higher education and scientific research represented as a separate entity managed by the dean of the institution or whom fill the position.
- ii. The institution is to be linked with Al Nahrain University located at Baghdad.

##### b) *Second Bond*

The institution aims to achieve the following criteria

- i. Provide the diagnostics and treatment means in the field of infertility with the most recent advanced scientific techniques without negation with rule of sharia law or moral values with suitable prices.
- ii. Provide the scientific specialized consultancy in the fields of infertility and human reproduction system to the governmental and private sections.
- iii. Provide specialized staff in the medical fields.
- iv. Stay up-to-date with the latest developments and trends in the field of infertility treatment and fetus research.
- v. Expand the scientific awareness about the reasons of infertility disease, the possibility of its prevention and cure.
- vi. Doing research which does not contradict with the rules of sharia law and the rights of both the women

with the egg and the man with the sperms keeping the lineage of the fetus to his/her legitimate parents.

- vii. The fetus exploitation and trading is strictly prohibited.

##### c) *Third Bond*

The institution is willing to achieve its goals by the following means:

- i. Opening a specialized center for the Diagnosis of Infertility and Assisted Reproduction Techniques which will be established according to the highest scientific standards including a consultancy clinic providing diagnostics and treatment services the local and foreign citizens, with a branch for the Techniques of Assisted Reproduction which includes modernized medical operations hall and a laboratory with the most recent equipment to develop Intravenous injection and IVF techniques.
- ii. Exchange expertise with similar institutions inside and outside Iraq.
- iii. Doing high quality scientific research in the fields of external fertilization, intravenous injection technology, sperms and fetii freezing and transporting, and treatment of lamentation of the fetii wall.
- iv. Issuing a specialized scientific journal.
- v. Hosting training and developmental programs for the staff of the institute.
- vi. Opening positions for postgraduate studies in the scientific and clinical fields according to the law of the postgraduate studies issued by the Iraqi ministry of higher education and scientific research.

##### 3) *The vision of the Institute*

The institute aims at achieving excellency in providing top quality academic programs that are inline with the scientific and medical developments in the fields of infertility and its treatment on the local, regional and global levels reaching the highest success rates in employing external fertilization techniques and reducing the infertility problems.

##### 4) *The mission of the Institute*

The institute mission comprises in three levels. The first, qualifying and training scientific and academic staff through the postgraduate programs and scientific research. The second, providing high quality clinical services to the infertility patients –both men and women- these services include both diagnostics and treatment sides using the latest techniques of assisted reproduction. While the third level is represented by maintaining and developing the two previous levels through scientific and applied research that aims to solve the problems and difficulties facing the infertility treatment in all its forms.

##### 5) *The goals of the Institute*

In order to fulfil an organization economic and/or social goals it is required for an organization to make the plan, policies, and programs that specifies the modality of resources management and follows the results of its work by providing a monitoring system showing the progress, the difficulties, and

the problems of the work and how to overcome these problems and difficulties by a sustained integrated system to assess the total performance of the organization.

The HIDIART institute aims both academic and treatment goals, in terms of academic goals it aims at:

- i. Granting scientific certificates for the degrees associated with the postgraduate levels in the fields of techniques of assisted reproduction, applied embryology, and genetics according to requirements of the Iraqi ministry of higher education and scientific research
- ii. Performing scientific, clinical, applied, an essential research in the fields of techniques of assisted reproduction, embryology, and infertility.
- iii. Hosting training programs, seminars, and workshops in the scientific fields.
- iv. Hosting postgraduate students' conferences.
- v. Providing a scientific specialized consultancy in the fields of infertility, its treatment, and genetics to the governmental, private, and scientific sectors.
- vi. Maintaining partnership among medical, educational, and research institutions and coordination among these institutions with the goals of developments in medical, academic, and research fields to find routes that can in turn reduce the problem of infertility and making use of the most recent techniques to reduce the difficulties facing the infertile patients.
- vii. Accentuating on the latest technical techniques of infertility treatment; and encouraging the students to present their research outcome and discuss it on a public level. In addition to provide the most suitable conditions to perform the natural or the surgical assisted pregnancy using intravenous injection techniques or in vitro fertilization.

One of the accomplishments made by the HIDIART institute is issuing the scientific journal (Iraqi Journal of Embryos and Infertility Researches) and receiving the DOI from CrossRef organization.

In terms of medical goals the HIDIART aims at:

- i. Providing diagnostics and treatment means in the field of infertility for both men and women with the latest scientific techniques.
- ii. Training scientific staff in techniques of assisted reproduction, applied embryology.
- iii. Presenting scientific lectures for the educational purposes for the infertile patients at the consultancy clinic.
- iv. Opening training courses and workshop programs specialized for the staff of the institute and the ministry of higher education and scientific research and other sections.

#### 6) *The departments of the Institute*

The institute has strong scientific relationships with fertility and reproduction both local and global organization, and it has an active presence in conferences and scientific activities in the fields of clinical reproduction physiology, fertility, techniques of assisted reproduction, and genetics developments. The institute is composed of two scientific departments which are: clinical reproduction physiology which in turn grants higher diploma level certificate in the techniques of assisted reproduction and the doctoral level certificate in applied clinical reproduction. The second department is applied embryology which grants the masters level certificate in applied embryology science.

#### *B. Clinical reproduction physiology*

This department was created since the establishment of the institute to grant the higher diploma certificate in the techniques of assisted reproduction. Physicians whom have a diploma in women and born or reproduction at least are eligible to apply for this position. The provided certificate allows the physician to provide services to the infertile patients in a scientifically methodologically treatment manner which allows him/her to get high success rate. The studies and research done by this department are in direct contact with infertility problems in all its various causes for both men and women searching for practical treatment solutions for the infertility problems using the Compulsory inoculation apparatus of the sperms using the fluorescence microscope to show the types of natural and artificial genes. The department also grants a doctoral level certificate in clinical and applied reproduction physiology. In addition to granting the higher diploma certificate in laboratory techniques of assisted reproduction, this certificate allows the physician to perform his/her services to the infertile patients in a systematic method of a scientific type which in turn help to increase the rates of success.

#### *C. Applied embryology*

This department is second department at the institute and it represent the cornerstone of the scientific structure of the institute. It was established at 2006 granting masters' level certificate in applied embryology for students who possess a medical school, veterinary medicine, or biology certificate. It concerns with teaching and qualifying specialized staff in modern and applied embryology in addition to performing clinical scientific research in the field of embryology development and genetic distortion and linking the environmental effects relating to the fetus growth in a service to the public community by reducing the problems of genetic diseases and distortions.

#### *D. Theoretical Mainframe of Dynamic Performance Management*

Although the concept of performance management is very common but the definition is somehow difficult to acquire since it take different directions [2]. The word "performance" is derived from the French word "parformance" refers to how well an activity or job is done [3] the performance is the ability of the organization to achieve goals using the available resources efficiently [4]. Stannack [6] notes that usually the researchers use performance to express the measurement relation between inputs and outputs. The performance is the

common denominator for the actual work done by managers and workers in business organization mainframe. Aljubouri [7] claims that most researchers express performance by the success of the organization to pursue its goals. So, the performance is a reflection of how an organization use its resources both material and human resources [8]. Organization performance as seen by Aljubouri is the main indicator of human, financial, and technology resources efficient use in addition to fulfilling the needs and desires of the workers [9] As of Aljubouri's view, organizational performance is the final result of organization interaction with both internal and external factors and include the following:

- Individual performance in organizational units.
- Organizational units' performance regarding the organization public policy.
- Organizational performance regarding social, cultural, and financial environments.

Indexes of measuring the governmental performance are problematic due to:

- a. The diversity of activities and differences in goals from one organization to the other.
- b. Differences in hierarchical management.
- c. The diversity and nature of services provided by the organization.

Kotler, and Keller [10] described performance starting from his model of excellent performance by introducing four factors that can achieve excellency in performance as shown in Figure 1. The importance of organizational management is as follows [11]:



Figure 1. Excellent performance model.

1. Enabling the higher authority to get a clear picture of the organization and then perform a total constructive revision of the organization management.
2. Determining and pointing out the ability of the organization for efficient use of available resources to achieve the highest income with lowest expenses and great quality.

3. Providing an information database that can support the organization ability to sketch the policies and realistic plans.
4. Defining the weak points and flaws in the activities and operations of the organization and trying to avoid it by making suitable solutions after analyzing the problems and identifying its cause.
5. Supporting the knowledge and embracing the performance as a measure for the organizational success through the willingness of continuing the organization activities to achieve its goals. So, the success is a combined measure relates the activity with the efficiency and then supports the organization ability to improve its performance and staying on the growth curve.
6. Knowing the organizational performance in combination with units and departments inputs and their share of the success will guarantee constructive competency to support potential capabilities of individuals making the success for the entire organization departments because it guarantees realism for continuous upgrade in the performance level.
7. The process of organizational management and performance level check will reflect on the entire organization the agreement and sustainability among goals, supported strategies and the relation with competitive environment of the organization.

Setting plans, programs, and policies are required from an organization to achieve its goals (both social and financial) this will show to the managers how to manage its resources efficiently and follow the results by setting a monitoring system in order to know the percentages of works developments and progress, difficulties and problems facing the goals of the organization, and the methods that can overcome these difficulties and problems by a total integrated system to review the performance of the organization.

1) Factors affecting performance

Organizational performance is affected by several factors that varies and differs with jobs. It is difficult to contain all these factors since all social, and financial phenomena will affect the performance. The most important factors affecting the performance is shown is Figure 2.

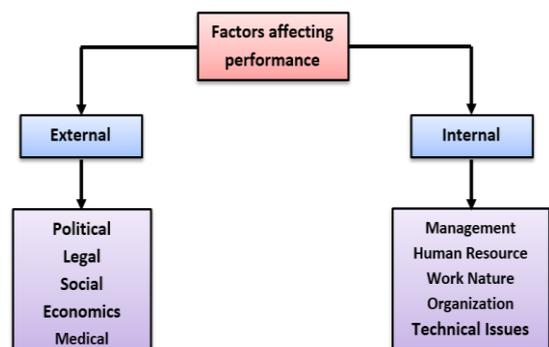


Figure 2. Factors affecting performance.

Healthcare services are different from other types of services by its characteristics, healthcare services are types of services and activities offers by healthcare organizations to the patients in need exchanged for certain payment. It employs an assistant materials to provide the services, these materials will not be owned by the benefiter from the services.

For example, when the physician uses the blood pressure apparatus to measure the blood pressure level of the patient, the patient will benefit from this service without owning the blood pressure apparatus.

#### E. Theoretical Mainframe of dependent variable Income

As a result of their long-term experience in driving the economical wheel, the countries realized that there is no escape from poverty chain and rise up in the national economy making the plans and programs for developing economics and social systems on to the working field, unless by enlarging the general income either by developing their traditional income sources or by fining new sources of income [12]. Income are represented by inflows or any increase, decrease, or settlement in the organization origins or liabilities or both, occurring during the accounting period due to completion or achievement of services or any other activates lying in the main operation zone or central organization zone [13]. Income are all what an organization can achieve like cash income, items, services as a result of providing an item or a service. It is the price of the item or the service provided in a certain amount of time. Income leads to an increase in property rights and is achieved and added to the accounting records when the service has been provided to the client or at item delivery or sale goods. On the other hand, expenses are the cost of used service in getting the income and is referred to sometimes as the “cost of doing business” [14]. Income represent the increase in origin “incoming cash flow” or increase in receivable credits as a result of project operations that are measured according to accepted accounting principles [15].

The difference between profit and income is that the income represents the cost of the item or the cost of provided service, while the profit is the net revenue minus the the costs, i.e., the profit or net income is the total income minus the total costs during a certain amount of time as equation below:

$$\text{Net income} = \text{Total Income} - \text{Expenses} \quad (1)$$

Income should be encountered with expenses contributed in the income generation, also the timing is important and should be encountered too because the expenses of a year are linked with the year’s income [16] and as the income increase the profit will increase and vice versa. While the expense as it increases the profit will decrease so encountering these factors will determine the result. The net income reveals the balance between net income and expenses. The acquired gain is a measure of work efficiency as the amount of profit grows the efficiency will be higher, the income is referred to as the return and is indicated by the margin [17]. Income may referred to as the commercial gain from service, commercial, or industrial project, it varies according to the nature of the project, for instance, in commercial projects profit is the difference between income and expenses, in industrial project profit is the difference between income and costs. Generally, profit is the

difference between income and expenses, if it was positive then there will be profit, if it was negative there will be loss.

#### 1) Types of Income

Income can be divided into the two main types:

Ordinary income: originating from goods sale and services the present the ordinary activity of the project and is measured by the income rate increase in net assets organization.

Extraordinary income: are the income gained by the project outside its ordinary activities by other activities due to management, legal, or economic factors, so it is hard to control and predict like (production subsidies, export subsidies, legal-related dispute compensation in past years) [15].

The ability of the government to raise fees on public services is related to a large extent with service nature, quality, and completion time to satisfy the citizen benefited from the governmental service. It is well-known that most of public services in Iraq did not meet the minimum boundary of fulfilling the Iraqi citizen major needs because of the problem inherited by the national economy from wars and siege in addition to bad planning and management. So, the advancement in public services can lead to:

1. Increase the government ability to raise extra fees upon provided services in a way that satisfies the citizens leading to an increase in the budget side related to the revenues.
2. As far as the citizen is concerned, providing public services in a satisfactory level will lead to increase the government ability to raise taxes leading to increase its income [18].

### IV. PRACTICAL MAINFRAME

This section has the main work of the article including financial reports, results and discussion.

#### A. Financial resources of the institute

Sources of revenue differs and varies depending on the organization’s activities. The importance of these sources is determined by the extent to which they achieve the objectives of the Organization which have been developed in advance and the most important financial sources that are returned to the universities and their departments are:

- Grants offered by the ministry or university.
- Allocations of scientific research allocated by the university.
- Income from consultancy services and activities.
- Donations from other parties (Council of Ministers, House of Representatives, International Organizations, Council of Governors, Charitable Organizations, and donations from officials and the wealthy citizens and expatriates)

The resources of the Higher Education Fund in accordance with the instructions of the Higher Education Fund No.122 in 1999 are as follows:

Article 6: [19]

The resources of the Higher Education Fund in the College or the Institute are formed as follows:

- i. 85% Eighty-five percent of the tuition fees received from the students in evening studies, as stipulated in paragraph 1 of Article IV of the Revolution Command Council Resolution No. 148 of 1996.
- ii. 85% Eighty-five percent of the revenues derived from the application of Revolution Command Council Decree No. 160 of 1985.
- iii. 70% Seventy percent of the revenues derived from the application of Revolution Command Council Resolution No. 82 of 1997.
- iv. Half of the percentage allocated to the University, College, Commission or Institute of the revenues achieved in accordance with first item Article 13 of the University Service Law.
- v. Revenue generated by its services and activities.
- vi. The revenues of the scientific advisory bureau in accordance with the active legislation.
- vii. 85% Eighty-five percent of the profits realized from the investment of movable and immovable property belonging to the College or Institute.
- viii. Grants, donations, gifts, payments and subscription in accordance with the approved legislations and regulations.
- ix. Fees of postgraduate and undergraduate morning studies for the special channel submission to the colleges and institutes and departments linked to the University.

Article 7: [19]

Resources of the Higher Education Fund in the Center for Scientific Research consists as follows:

- i. The revenues of the consulting bureau in accordance with the active legislations.
- ii. The revenues generated by the services and activities of the Center.

For the Higher Institute of Diagnosis of Infertility and Assisted Reproductive Techniques the activities are as follows:

- a. Optional IVF operations.
- b. Compulsory IVF operations.
- c. Artificial Vaccination operations.
- d. Implantation of sperm and eggs in the fallopian tube.
- e. Antimicrobial antibody Anti-emetic examination
- f. Fertility testing of human sperms.
- g. Medical examinations
- h. Laboratory analysis

- i. Completion of the value of medicines purchased from the revenues and allocations of the Institute with the addition of 5%. Five percent to their value as administrative requirements.
- j. Revenue from the sale of laboratory sperms.
- k. Grants, gifts, donations and subscriptions in accordance with the approved legislations and regulations
- l. Profits from the investment of movable and immovable property.

The Institute receives revenues through its activities and services provided to the community as shown Figure 3. The following Figures 4,5, and 6 shows the number of patients treated at the HIDART Institute, the number of operations done at the HIDART Institute, the income received by the HIDART Institute for the years 2013-2018.

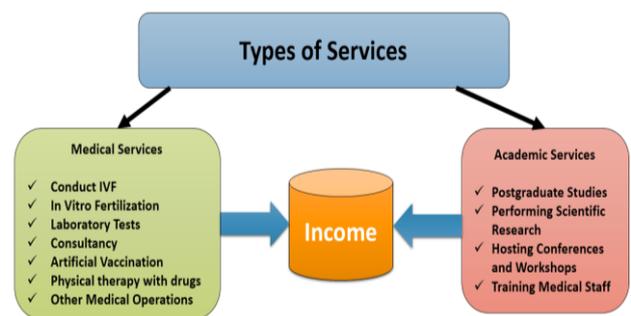


Figure 3. Types of services provided by the institute

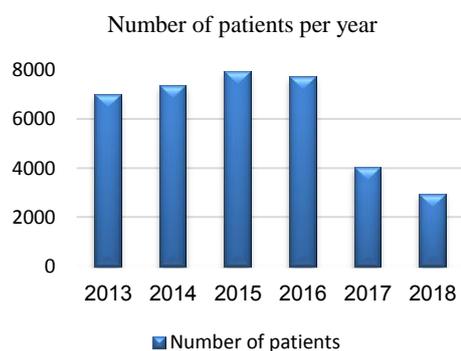


Figure 4. Number of patients treated at the HIDART Institute.

There is a trending increase in the income levels by the years due to the rise of trust of patients to perform operations at the High Institute of Diagnosis of Infertility and Assisted Reproduction Techniques. The Institute has an independent accountancy unit and has the right to open a special account in any of the governmental banks. The accounts of the Institute are subject to the supervision and audit of the Financial Control

Bureau. According to the instructions of the Higher Education Fund No. (122) in 1999, 50% of these revenues are allocated to the Institute and 40% to the bottlenecks. These include (expenditures of goods and services, maintenance and payment of physicians and workers) and 10% for the university and the ministry. Financial analysis has become a process through which a set of quantitative and qualitative indicators on the organization's activity are discovered or derived, which contributes by determining the importance and characteristics of operational and financial activities through information extracted from the financial statements. So that these indicators can then be used to assess the organization's strategic performance [13]. The financial statements are the results of the accounting system which reflects the financial situation and the results of the work of the Institute at a certain date. The elements of the financial statements must have the characteristics of reliability and suitability to express their sincerity and fairness so that the data and information contained therein can be relied upon by the users of those lists [20]. The financial statements are the means by which a picture of the financial position of the organization is communicated to the management and the parties concerned [14].

The analysis of the financial statements contributes in determining the strengths and weaknesses of the performance of the company, providing them with important indicators of past and present performance and trends of this performance in the future, and financial analysis as a process of dealing with an organization of financial data available to obtain information used in the decision-making process [21]. The accounting system used by the Institute is the unified accounting system. The income from special expenses for postgraduate students is returned to the Institute's fund. The Figures 7, and 8 shows the number of postgraduate students per year at the institute and the income to the institute as a results of tuition fees, respectively.

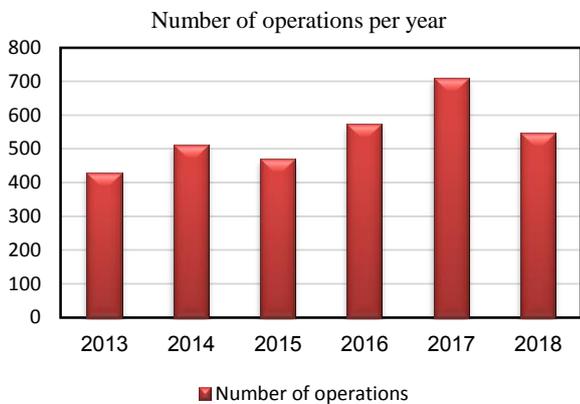


Figure 5. Number of operations performed by the HIDITAR Institute

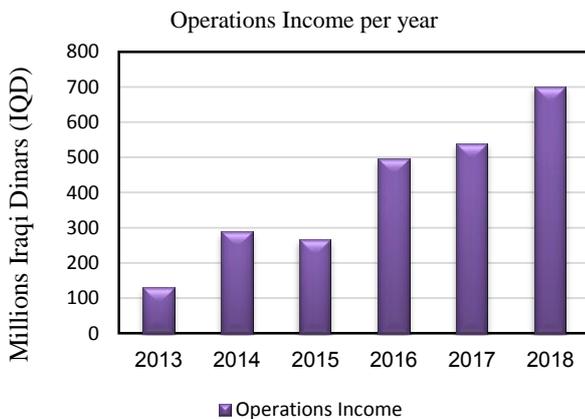


Figure 6. Operations income to the HIDIART Institute

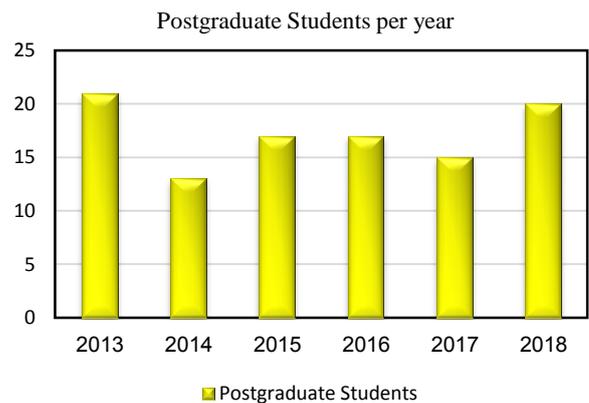


Figure 7. Number of postgraduate students at the HIDIART Institute.

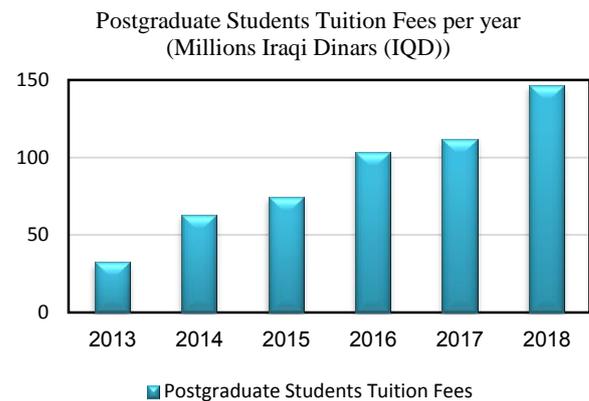


Figure 8. Postgraduate student tuition fees at the HIDIART Institute

Due to the absence of a sufficient budget to cover the expenses of the Institute, 15% of Postgraduate student tuition fees for university and ministry are allocated, 40% research requirements, 15% maintenance of premises, 25% lecture fees, and 5% employee reward.

The HIDIART Institute has received 42% success rate in 2017 in comparison with some European countries, according to the European Society of Human Reproduction and Embryology, so The Higher Institute for the Diagnosis of Infertility and Assisted Reproduction Techniques' position is in the pioneering success worldwide, as shown in Figure 9.

## V. CONCLUSIONS AND RECOMMENDATIONS

The Institute relies mainly on the revenues it receives from the operations and services it provides to the community in general and to infertility patients in particular in meeting its expenses.

There is a strong correlation and impact between the performance of the Institute and its services and the level of revenue it receives.

The Institute includes a number of professors and physicians and holders of certificates in the field of infertility and other scientific specialties.

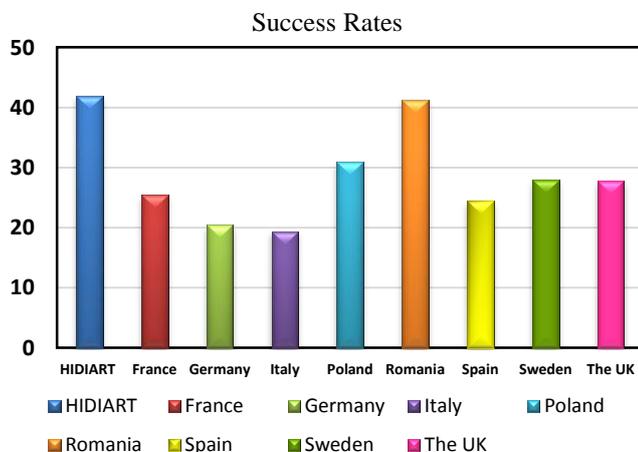


Figure 9. Success rates comparison in 2017 between the HIDIART Institute and worldwide countries.

Intensify the advertising campaigns of the Institute not only at the local level but at the Arabian, and global levels to get the desired recognition and rank among the centers of treatment of infertility in the worldwide.

Involve the medical staff and employees of the Institute to participate in the courses, seminars and workshops held within the country and worldwide to gain more skills and experience in the field of their work at the health and administrative level and to recent trends in modern medicine increasing the awareness of the staff to address this sensitive disease, which causes the decline or lack of human resources Presenting the Institute's achievements by setting up a TV screen in the guest rooms to view the achievements of the Institute at healthcare levels and the most important births made at the Institute as well as pictures of the births that took place in the Institute.

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