

Implementation of the communication system for clubfoot

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Abstract: - In view of finding out the size of and demand created by clubfoot in our country, we have designed, created and implemented an integrated communication system for the congenital idiopathic clubfoot. On the basis of the information and data in this system, the parents have an information resource at their disposal that enables them reach a decision concerning the way in which the deformity of their child could be treated. The integrated informational system for the congenital clubfoot has two components: the medical component – dedicated to the medical staff – and the informative component – dedicated to the parents and children suffering of clubfoot. The system also, will generate positive economical implications.

Key-Words: - National Register, clubfoot, medical communication, database, research

1 Introduction

The analysis of the data in the Romanian specialised literature available for congenital clubfoot until now shows differences among hospitals and clinics [2,4,5,6,15].

This is the main reason for which we think it is necessary to develop a rigorous analysis of the strategy related to the treatment of clubfoot and to implement a nation wide unique strategy complying with the data in the international specialised literature to get realistic information on this disease and to compare the national and international results in the field.

Due to the very large resources provided by the Internet, the patients are better informed and more involved in the making decisions concerning their state of health. In the United States of America, 73 million people are said to use the Internet to get informed on topics related to health. Their decision-making process related to methods of diagnosis and care chosen is affected by the satisfactory information found. It is for this reason that the Internet is seen as the most powerful source of information available for the patient [16].

Having in view this need and requirement, we have designed, developed and implemented an integrated information system for the congenital clubfoot. This information system is made up of two components. The first component of the integrated system proposes the organisation of an online database, in the form of the National Register for clubfoot that enables the recording of all the children suffering of this deformity so that the actual size of the disease can be established. The second component was designed in the form of Internet-based resources for clubfoot and is available online at <http://piciorstramb.bravehost.com>.

2 Material and method

The integrated information system for the congenital idiopathic clubfoot has two parts: the medical component – dedicated to the medical staff – and the informative component – dedicated to the parents and children suffering of clubfoot.

2.1 The medical database

The medical component derives from the need to make a rigorous investigation of this pathology, to know the actual incidence of this disease in

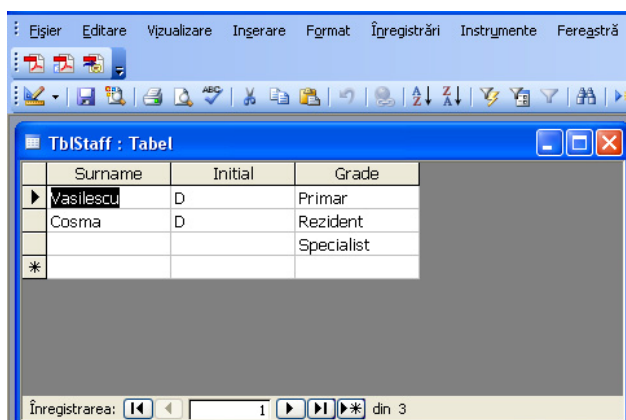
Romania and the exact type of treatment practised in Romania.

The setting up of a system to allow for the right selection of the data is a must for all the researchers. In the medical field, statistical methods can and should be found in any research carried out . [1] The correct selection of the data is the main purpose of this component.

Today, the data needed for research are registered in medical documents, in a written form, but not in a unique form and the work necessary to retrieve and process such data is enormous.

The medical component of the information system for clubfoot, the gathered data take a unitary shape. Any variable introduced in the system can be analysed through a friendly interface, according to the need of the research. As each user has to fill in all the fields, the data stored become unitary and complete.

In view of this feature, we have designed an application in Microsoft Access 2003, to include the database itself, the form for the insertion of data and the report form. [14]



Surname	Initial	Grade
Vasilescu	D	Primar
Cosma	D	Rezident
*		Specialist

Figure no.1. Table „TblStaff” contains data on the treating doctor

The database is made up of four tables: TblLogbook, TblStaff, TblHospital and TblDiagnosis. The „TblLogbook” table includes data on the patients, „TblStaff” - on the doctors, „TblHospital” - on the hospital where the deformity was/has been cared for and „TblDiagnosis” – data on the diagnosis. (Figure 1)



Figure 2. The opening screen of the medical application

The form for data insertion opens with a welcoming unique screen containing information on the purpose of this application. (Figure 2)

After pressing the key „Enter”, the user reaches the form for data insertion. Here the data on the patient required by the application are introduced. (Figure 3)




Figure 3. The form for the insertion of the data on the patient

The user can modify or add to the fields concerning the medical service, the medical staff and diagnosis by pressing the key „Add”, related to each of these fields. The rest of the form contains various kinds of fields, text types, radio buttons or lists for the correct insertion of data. (Figure 4)

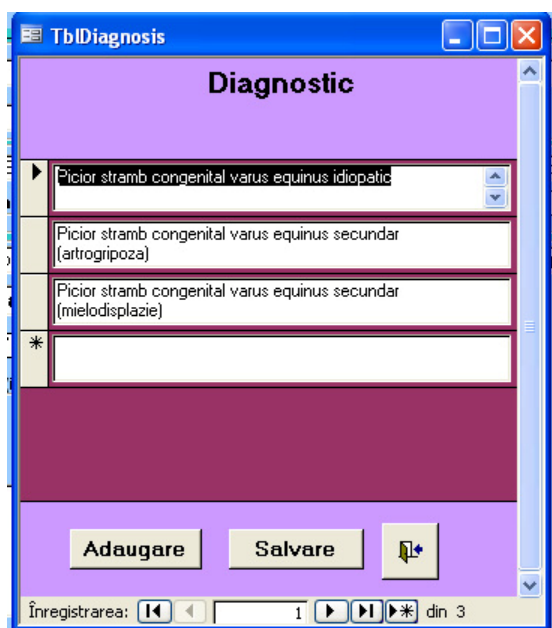


Figure 4. Form for adding to or altering the field „Diagnosis”

Finally, pressing the key „...and print”, a report is automatically generated for each patient; the report contains personal data, diagnosis, type of treatment subjected to and recommendations for the future. This form is signed and stamped by the doctor and becomes the medical document to be added to the patient’s file. A copy is handed to the patient and so the anamnesis for a would-be visit or change of doctor is much facilitated. (Figure 5)

2.2 The informative component

The Internet-based clubfoot resources address to the parents of the children diagnosed with congenital idiopathic clubfoot.

We investigated the availability and quality of the sites found on the Internet. The term of „picior strâmb” was chosen as we found that only this part was usually memorised by parents and this phrase was connected to their desire of finding more data, as it was shown by our analysis of the complete treatment established by the treating doctor. We have reproduced the parents’ behaviour that usually access the Internet, introduce „picior strâmb” in the most often-used search engine: Google.ro, once they possess the diagnosis.

The results of the search have been analysed from many viewpoints: authors, page content and worth of the data. The authors of the sites have been divided into the following categories: academic institutions, doctors’ personal sites, discussion forums, commercial pages and others. The page content and the worth of the information have been analysed in view of the aspects related to aetiology,

clinical manifestations, and types of conservative and surgical treatment.

Then a multimedia material was made to create and integrate various types of media: images, pictures, diagrams, text, and data for information on the congenital clubfoot. This material was produced in HTML hypertext language with the help of the application AceHTML and was published on The Internet at the address <http://piciorstramb.bravehost.com>.

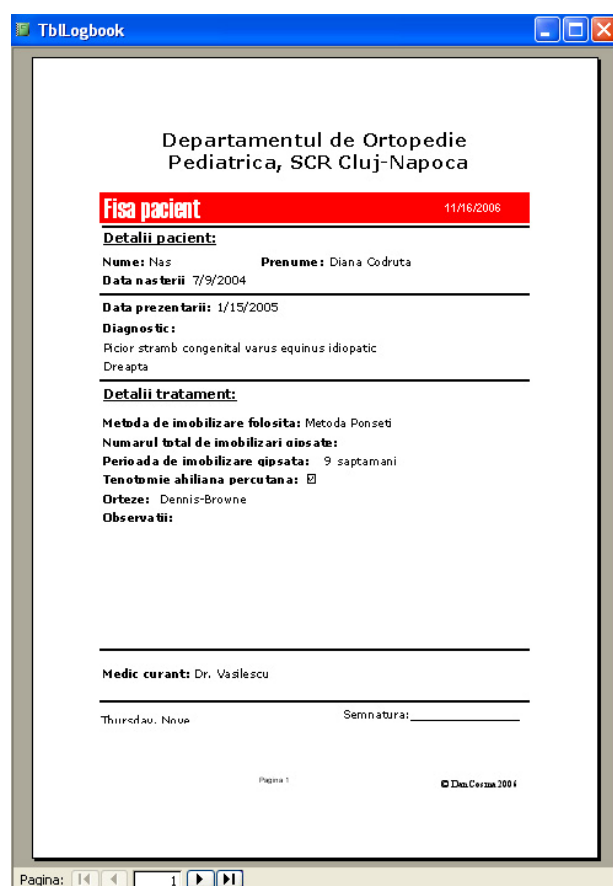


Figure 5. Final report generated by the application for each patient

3. Results

3.1 The medical database

The implementation of this application in the Department of Paediatric Orthopaedics of the Clinical Rehabilitation Hospital of Cluj-Napoca, since September 2006, has been a success. Data definition, flexibility of use has been appreciated positively by the staff working in this department. The use of the application decreased the time needed for registering the new clubfoot cases. The writing and filling in of the medical documents (to whom it may concern) has become easier due to reporting that makes synthesis of the data on each individual

patient and provides them in a printable form, ready to be signed and stamped.

The new cases of congenital idiopathic clubfoot have been already registered in our database and become available both for our department or similar departments of paediatric orthopaedics.

3.2 The informative component

This study has evaluated the data found in Romanian on the Internet on congenital idiopathic clubfoot. Searching for the term „picior strâmb” with the engine Google.ro gave 19 results. All the sites have been assessed separately with the criteria established at the beginning of our study.

Table 1 shows the authors distribution web pages. The authors who could not be categorised have been included in the chapter „Other authors”.

Table 1. Web page distribution on clubfoot relative to their authors

Web page authors						
Academic institution	Personal pages	Discussion forums	Commercial pages	Other authors	Total	
4	0	5	5	5	19	

It is found that the majority of the data found on the Internet on clubfoot originate in the discussion forums and companies working for medical purposes, academic institutions being less in charge with the dissemination of the authorised medical information.

From these pages it has been evident that no site contained information on the aetiology, clinical manifestations and treatment of clubfoot. This aspect and the idea that most information originate in medically non-authorised sources led to the conclusion that, the data on the Internet concerning clubfoot are extremely scarce, almost non-existing. Consequently, we have produced an informative material in the HTML language, made available at the address <http://piciorstramb.bravehost.com>. This material presents the most useful data on the congenital idiopathic clubfoot.

The first page is called „Definition” and contains a brief description of the deformity which is illustrated with photos from the author’s own archive. (Figure 6)

The use of the menu on the left hand of the page enables the user to reach the following page: „Therapeutic options”, which present the available conservative treatment and the surgery for the

congenital idiopathic clubfoot, with specific indications and counter indications. (Figure 7)



Figure 6. The opening page of the site „The congenital clubfoot”

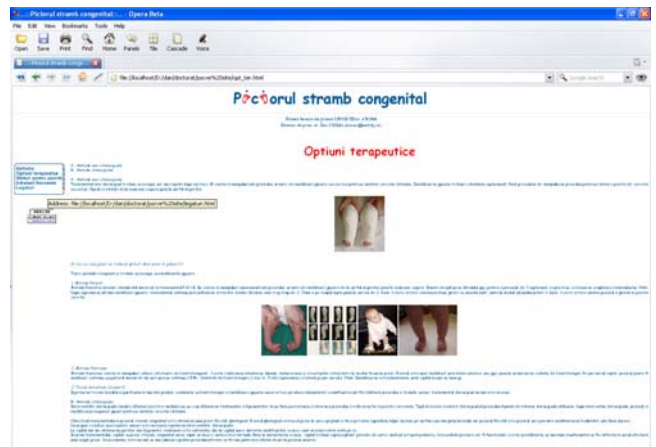


Figure 7. Page dedicated to the therapeutic options for clubfoot



Figure 8. Advice for the parents

The section dedicated to the advice for the parents shows practical aspects for the care of the children treated for clubfoot. (Figure 8)



Figure 9. FAQs



Figure 10. Links available from our site to other pages with information on clubfoot

The page „Frequently asked questions/FAQ” gives answers to the most frequent questions raised by parents during the treatment in our department. (Figure 9) The material finishes with „Links” that provide the route to other authorised pages containing data in English on PSCVEI. (Figure 10)

4 Discussions

The Internet is physically a network of networks of computers. It has started with over 2.5 million computers and has increased by more than 2 million new users every month. Conceptually, the Internet represents a way of getting access in a new and more efficient manner to the organisation and conveying of information. Until recently, the Internet was seen as a field belonging to science, with a complex interface, based on the UNIX operation system difficult to be learnt.

The connection to the Internet was financially untouchable for the large majority of individuals and institutions an exception being government,

education and solid companies which could make use of the complex system. The introduction of the World Wide Web (WWW) has changed everything.

WWW is a relatively new service on the Internet, based on hypermedia. The authorised users of hypermedia use a point to navigate on the Internet and access an interface that is similar to the Macintosh and Windows computer operation systems. The interface used for organising the information originating in the hypermedia is called „browser”. The most popular browsers now are Mozilla Firefox and Internet Explorer. WWW browsers eliminate the need of learning complex computer-based controls (the user is no longer forced to learn the UNIX operation system). The use of hypermedia is equivalent to learning to read a book and has some other advantages over the conventional communication means.

Hypermedia is not perceived as a physical object, it can be sent away in the entire world in some seconds and in many situations the user is not aware of getting access to a computer in the USA or France in a time interval of only seconds or minutes.

Hypermedia is interactive – i.e. it allows users to get in contact almost simultaneously with other information sources. The connections take the shape of images or highlight text. The links are established by the creators of the documents and lead to other related connections available from their site or from other sites around the world. In the WWW is available for each of us „ad literam”. Hypermedia is dynamic – alterations and additions made later on can be inserted quickly and simply. The number of information increases and they can be conveyed at a relatively low cost. The time of transmission is very short and the investment in the equipment required is relatively small [8].

Hypermedia simplifies the navigation through very large sized documents. As the user has access to various topics, themes and subjects, he/she can navigate through multiple documents found in the computers around the world with no effort.

Hypermedia is „friendly” multimedia. It can include not only text and figures, but also sound and picture, which gives a new dimension to the hypertext documents, as they are more attractive and useful for the readers. In the WWW, a product can be not only seen and explained, but also listened to and demonstrated.

The Internet has developed extremely fast in the last two decades as the number of personal computers and network components has also increased. In Great Britain, approximately 40% of the population

has access to the Internet. [17,18] The development of high speed communication networks (ADSL) makes high speed Internet available 24 hours per day. This phenomenon also leads to a friendlier environment in the Internet and a quicker file transfer. The accessing of the Internet requires the use of the browsers (Internet Explorer, Netscape Navigator). All the browsers make appeal of search engines to find the information on the Internet.

The universe of the Internet is without boundaries. The information hosted by servers in the United States, Japan or Europe can be accessed from any corner on the globe. In the United States, there are 20,000 sites dedicated to medical issues and 1500 new sites appear every month. [9,16] A recent research shows that about 50% of the patients access the Internet in search of new medical data. [3] The United States of America represent the richest source of information found on the Internet, and host over 80% indexed pages.

With the extension of the communication means offered by the Internet, the patients have become more aware of their problems and expect a more active involvement in the decision making process related to the management of their diseases. Though many organisations control the data level provided on the Internet, the World Wide Web (WWW) provides so many options that it is practically impossible to make the quality assessment for each case. [11,12] Therefore, patients can be really misinformed before getting to the doctor. [13]

In an article published by Aslam in 2005 [1], it is appreciated that the Internet has both qualitative and quantitative limits. British parents are more critical in so far the information spread on the Internet are concerned and only 65% recommend the Internet as an information source as compared to 90% of the American parents. The authors of the research find a general positive attitude versus the Internet, but consider that the visit to the doctor and direct consultation must not be avoided and substituted by the reading on the Internet. Parents find the Internet data easy to reach and too large sized, on the other hand. The British authors found that 53% of the parents saw as useful the information found as they helped them understand the medical consultation, and 26% of them asked questions based on the data found on the Internet. The more informed parents are on the disease of their child, the longer the consultation time. Parents want an active involvement in the care supplied to their children.

The reading of the web pages in Romanian on the congenital idiopathic clubfoot has shown that medically approved pages do not exist. Hence, an empirical approach of the parents related to the

consultation and treatment of clubfoot, as the parents do not possess the information that could help them make the best decision for the deformity of their child. .

This took us to the production of the multimedia material on clubfoot, published on the Internet at <http://piciorstramb.bravehost.com>. We think that this material diminishes the lack of information for this quite frequent congenital malformation. The site for informing parents on clubfoot provides an information source that could enable them make a decision on the treatment of their children's deformity. The number of votes (533 in two months) demonstrates the fact that such a resource has long been expected, as data on clubfoot are still very scarce.

Having in view the above, we consider that the introduction of an integrated information system in Romanian has become a need for patients and doctors alike. Good quality data are extremely useful for the medical staff and family and invalid data are very detrimental for both parties.

The medical component of the system implemented in our department as Microsoft Access application of gathering and analysing the data has proven extremely useful.

The uniform data collection enables a rigorous analysis of this congenital disease, and eliminates data collection type errors. We consider that this application can be implemented in any medical centre of paediatric orthopaedics in the country, as materials investment is minimal and practically available everywhere in the country.

Health marketing takes into account on the one side the healthy person and the promotion of the healthy individual medicine and, on the other side, the medicine of the ill, dealing with the diminishing of the number of ill cases, the fight against the consumption of products that endanger human body (alcohol, tobacco, drugs) and the raising of the awareness in so far the danger represented by the spreading of AIDS, cancer, hepatitis etc. is concerned.

The notion of health is defined in different manners by various authors [7].

The World Health Organisation (WHO) defines health as a state "of complete physical, mental and social comfort or the absence of the disease or infirmity".

Health care services have the role of promoting the physical, mental and social state of comfort to an individual so that this is healthy. The manner in which WHO defines health is an ideal one and very few people frame within this definition.

A more up-to-date alternative for the concept of health was given by Brody and Sobel. They define health as “the capacity of a system (cell, body, family) to respond in an adaptive manner to the various challenges in the environment (be they physical, chemical, infectious, psychological, social)”. In this case, health is seen as a positive process and not through the lack of symptoms. This kind of approach includes the environment as a component besides the individual’s state of physical or psychological comfort [7].

The individual health forms the basis of the concept of public health. Public health refers to the set of information, skills and attitudes of the population that are focused towards the preservation and improving of health, with a stress upon the social factors that are involved in the preservation of health. The aim of public health lies in entraining the members of a community in the action of preserving and promoting a healthy environment, the main objective being the prophylaxis of sickening.

Nowadays the healthcare system from every country have to faced to many challenges of the 21st century which influenced significant the financial aspects of the organizations’ activities. In these new conditions the competitions increased and pressed on the costs to acquire and maintain a high quality of the technology and capital outlay.

Today’s changes in the healthcare systems are calling all healthcare providers to realize the importance of marketing, bringing about a “renewed emphasis on research, measurement, planning, analysis, forecasting, targeting, segmentation, and strategy” [10].

An important change into the market that affects the entire healthcare system was the transformation of the patient into a consumer. As patients, people were submissive. They went to the doctors their healthcare plan dictated, followed only the instructions of their physician, and went to specialists and hospitals designated by their physician and/or health plan. But as consumers, people play a much more active role in their healthcare. They stop and compare health plans, research symptoms and diagnoses, and are sensitive to direct and indirect costs.

Due to the very large resources provided by the Internet, the patients are better informed and more involved in the making decisions concerning their state of health. In the United States of America, 73 million people are said to use the Internet to get informed on topics related to health. Their decision-making process related to methods of diagnosis and care chosen is affected by the satisfactory information found. It is for this reason that the

Internet is seen as the most powerful source of information available for the patient.

Internet-based informational resources should be considered by the healthcare providers for applying new strategies for improving the healthcare services quality and satisfying the patients’ need. As Thomas explained, healthcare consumers “want the outcomes of the healthcare system as patients and the benefits incurred by customers”. They “expect to receive adequate information, demand to participate in healthcare decisions that directly affect them, and insist that the healthcare they receive be of the highest possible quality.” They also “want to receive their healthcare close to their homes, with minimal disruption to their family life and work schedules,” all while maximizing the value and minimizing the cost.

The Ministry of Health is the central authority of the public healthcare service, starting with 1999 has no longer a direct control over the financing of service providers, and become responsible for the planning and coordinating activity of this sector. Its role was transform in one more oriented to the policy of the sector. The district health directorates are the representative body of the Ministry of Health at district level and their main responsibilities are: developing public health programmes, monitoring of health status of the population in relation with the main environmental risk factors and collaborating with other actors involved in this field at district level [7].

According to the Health Insurance Law the insurance payment became mandatory and it was linked to the employment, respectively the contribution depends on income and it is paid in even shares by the insured and the employer. These funds are collected and administrated by the National Health Insurance Fund and its local districts, which are specialized on setting rules for the functioning the health insurance system. Based on his contribution the insured are entitled to receive health services, pharmaceutical and medical devices. Covered medical services include preventive health care services, ambulatory health care, hospital care, medical emergency services, complementary medical rehabilitation services, home-care nursing, drugs, health care materials and orthopaedic devices. For this purpose the Districts Health Insurance Funds (DHIF’s) contract services offered by the public and private providers. The contracts between the DHIF’s and providers organizations include: the list of health services to be provided by health units, the services’ quality and efficiency parameters, the method of payment, the hospital length of stay, criteria and medication. The medical services are

paid by DHIFs on contract bases. The fees for services are used by healthcare providers for ambulatory medical services, global budget and payrolls.

The implementation of new legislation of health insurance system encourage many care providers to move into the private sector and operating as independent organizations.

From this evolution results that the private healthcare organizations increased each year and the most important ponder has in pharmacies sector and policlinics. Also should be mention the increasing number of private family doctors offices, starting with 2004. In the inpatient sector, most hospitals are still under public ownership, with very few initiatives of private practice.

In 2004 the private healthcare organizations employed almost 60000 people, which represents 16% from the total employment in this sector and the revenues declared by them were totalized almost 28% of the total health expenditure. In general the value of expenditures for health services increased each year reaching in 2007 the 4,12% from GDP, being at a level of 4500 USD millions. From this amount almost 3,4% of GDP is administrated by the National Health Insurance Fund.

Comparing this ponder with their of other countries, in a study conducted by World Bank in 2002, resulted that the public spending rate is correlated with the level of economic development of the country, respectively with the GDP per capita rate. In 2006 the Ministry of Health decided that, due to the increasing tendency of Romanian citizens, it is required for the future to apply measures for increasing healthcare services expenditures efficiency. The most significant sector for achieving the new objectives was set up the primary healthcare services, represented by the surgeries and family doctors offices. Due to a low level of the primary care expenditure in the total services expenditure of NHIF, about 5 % in 2006, the ministry decided in the strategic plan an increasing of this indicator to an 11% [7].

According to the health service reform the general practitioners were assigned with a gatekeeping role and also introduced competitive elements through patients choice and new forms of payment. The wage system for general practitioners was replaced with a mix of weighted capitation and fee-for-service payments. Patients were granted the right to choose their general practitioners and given the possibility of changing after 3 months to another general practitioner. This situation combined with the possibility of increasing the primary care expenditure determined the root for competition increased. The

competition among healthcare providers will increase more in the future, especially with the rise of consumer interest and demand outcomerate. The fundamentals of competition into the Romanian healthcare services will be also the starting point of orientation to quality improvement. In a 1996 Journal of Health Care Marketing, Rapert and Babakus wrote: „Quality should not be viewed as merely a problem to be solved; rather, it is a competitive opportunity. In an era of increasing competition and potential additional government regulation, a strong quality orientation can serve as the means by which a hospital differentiates itself from its competitors.”

Romania Public Health Ministry have adopted in April 2006 the law regarding the reform of the health care system. One of the paragraph is referring to the national and European health insurance card taking into account the European Union standards. To apply this law is compulsory to use a centralized data base system [7].

The model presented above offers the opportunity for improving the health care system from the economical point of view:

- ❖ it is effective for the doctors - specialists and for health related staff and also for the family doctors; they can access all the needed information about their patients;
- ❖ it is efficient for the patient; they will be better informed for preserving and promoting a health environment;
- ❖ it improves the quality of the health care services through the possibility of illness risk prediction on geographic area or medical centres;
- ❖ an important contribution from the marketing point of view is the identification of the different types of demand (target markets); knowing the needs of the potential market segments it is possible to specialize the medical centres on specific fields/ categories.

The increasing need for health care education of the population and the increasing competition in the field of medical services in Romania are the premises for introducing a marketing-based orientation in the medical institutions in our country. First, it has an educational role as both the fulfilling of the demand manifested and the creation of that demand are aimed at. From this point of view, private and state-owned institutions behave differently. The former are more receptive to accept marketing for improving their activity. The latter, still used to act under the protection of the centralised thinking, admit at slower pace to accept and use health care marketing.

The limits of the application are represented by the relatively small number of variables in use and the analysis of only the conservative treatment for the clubfoot as the surgical treatment is not included here, and the local implementation of the databases as the distribution of the collected data through the Internet is not yet available. This is the reason for which we think that the insertion of more variables for the future, including the surgical treatment and the Internet-based data distribution must be added.

5 Conclusions

The would-be integration of such informative sources in a single national system, of the National Register- type, will improve the quality of the data available for the researchers in Romania and the outcomes of the studies carried out will generate the basis of uniform treatment protocols, to be made available for all the medical centres in Romania so that the quality level of the medical act will be standardised and improved.

The Internet can be an alternative information source for the parents of the children exhibiting relatively uncommon diseases. In general, we have found that the quality of the information is relatively scarce and poor. The results of the search are affected by the strategy of search, level of knowledge and education of the parents, and familiarity to the use of Internet.

The implementation of a medically authorised integrated information system is a need for the medical system in Romania. The creation of such a system for the orthopaedic congenital malformation (clubfoot) has proven to be a singular action in Romania, as it supplies a research basis for this pathology and an information basis for the parents and children. Parents make use of this site as a guide for the pathologic entity their children suffer of and a basis for the consultation of their children.

In the context of the wealth of data to be found on the Internet, academic sites should be encouraged to supply guides and good, trustful information to the parents of the children.

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