

How to Search, Write, Prepare and Publish the Scientific Papers in the Biomedical Journals

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Editorial

SUMMARY

This article describes the methodology of preparation, writing and publishing scientific papers in biomedical journals. Given is a concise overview of the concept and structure of the System of biomedical scientific and technical information and the way of biomedical literature retrieval from worldwide biomedical databases. Described are the scientific and professional medical journals that are currently published in Bosnia and Herzegovina. Also, given is the comparative review on the number and structure of papers published in indexed journals in Bosnia and Herzegovina, which

are listed in the Medline database.

Analyzed are three B&H journals indexed in MEDLINE database: Medical Archives (Medicinski Arhiv), Bosnian Journal of Basic Medical Sciences and Medical Gazette (Medicinski Glasnik) in 2010. The largest number of original papers was published in the Medical Archives. There is a statistically significant difference in the number of papers published by local authors in relation to international journals in favor of the Medical Archives. True, the Journal of Basic Medical Sciences does not categorize the articles and we could not make comparisons. Journal Medical Archives and Bosnian Journal of Basic Medical Sciences by

percentage published the largest number of articles by authors from Sarajevo and Tuzla, the two oldest and largest university medical centers in Bosnia and Herzegovina. The author believes that it is necessary to make qualitative changes in the reception and reviewing of papers for publication in biomedical journals published in Bosnia and Herzegovina which should be the responsibility of the separate scientific authority/committee composed of experts in the field of medicine at the state level.

Keywords: System of biomedical scientific and research information, indexed medical journals in Bosnia and Herzegovina.

1. TERMS AND DEFINITIONS

Actual knowledge is acquired through the scientific research. Complete, general, specific, verifiable and applicable knowledge about the mankind is obtained by the scientific research (1, 2). Medicine fits into the general definition of science, as the rational human activity with the clear achievements, laws and opportunities. Medicine can only be seen as a science, and through the science, a doctor must apply the scientific method, simply, because it provides the best proven, deeply thoughtful and critical responses (3, 4, 5, 6, 7, 8). Physician's thinking and work is an essential and important scientific aspect, in order to be viewed as complete. Mature research thinking is the most complex and highest form of the human intellectual activity, and can be planned and transferred only by

a mature, knowledgeable and intelligent individuals who work systematically, consistently and fairly (9).

Science is just one of the enthusiasms that draw people, who, in life, not only care for their survival, but who also try to enter the areas, in which, a person can only be spiritually present. Science is not much different from philosophy. The highest degree of knowledge translates into the ability to research problems. The important scientific work is a team work, because it is a prerequisite for success. Team work is then followed by the research of the relevant literature, which acquaints us with the chosen theme and provides the ability to grasp the essence of the problem. This tedious progression is then continued by the assistance of the capable mentor – through the process, which can be very difficult. Scientific and profes-

sional work is primarily an educational tool; its content can be set in different ways. This work requires the use of the scientific literature and other sciences, except medicine, because, by following this path, we strengthen the style and spirituality of our work (10, 11, 12, 13, 14).

Science is a shared, coherent, organized and established knowledge of the human race and it is one of many human activities. It stands out, particularly with important contributions, thinking, technology of work and social roles. Science has four core values (1, 2):

- It is a key link of the education system,
- It is a part of the culture of the nation,
- It contributes to the overall well-being and safety in everyday's life,
- It represents a source of real

knowledge of mankind.

Definition of the scientific article was presented by the scientist, Day in 1983, and it reads: "The scientific article is a written and published report on the original research." (1). In most cases, the scientist is a person of exceptional diligence and, it is, at the same time, very focused on what it does. If someone is engaged scientifically, it can significantly improve the human condition to put the great effort and endeavor, with the understanding that the sacrifice of many daily pleasures, will eventually bear the compounding-human condition improving effects. We must bear in mind, that dealing with the scientific and professional work, requires a certain level of intelligence and this process also possesses the following characteristics: a) the average intelligence, b) the ability of analysis and synthesis, c) power for the observation, d) will, e) persistence, f) creativity, g) ethics and i) responsibility.

After the author selects an inviting and attractive, to him or her, close topic, he or she should be able to find a mentor. The author then creates the detailed list that will be his or her guide during the writing of the paper, and finally, the writing the project begins. The first thing that the author needs is to think, as to what to write and in which order, in order to create the best possible scientific publication, which represents the main method of communication among the scientists. Each item of work must be accurate, with a clear understanding of the presentation of research results, which must follow and represent, the logically proven procedures, in order to help to develop a logical scientific thinking.

As the authors, (with the help of their mentors or advised by their reviewers) devise a scheme of work and take all necessary materials for their research preparation, such as the approximate tables and charts that shall be later improved. It must be emphasized again that the preparation and design of work is different from person to person, in a process where each author is striving to find its own way to approach

the article and its own writing style that is acquired during the years of writing and mentoring. The basis for this development is the fact that this work is to be subordinate to the reader, which possesses unique style and harmonious arrangement. We have mentioned the contents, which, in essence, represent the construction work, which form the basis and pillar of the authors' imaginary parts. Scientific and technical papers are typically written instructions to the journals, in which the author want to publish his or her article. The overall idea is that every scientific or professional paper should have the appropriate chapters or parts (sections).

The concept of pointing out that the usual order of sections is contained in the abbreviation "IM-RAD" (1, 6).

- I-Introduction,
- M-Methods (or methods and materials),
- R-Results
- A-and
- D - Discussion and Conclusion

By following that order there must be a good reason to use a different expression, while, (quite to the contrary, in a review article, that would be quite inappropriate). Usual way in writing of articles for publishing in biomedical journals is to follow the instructions: – Vancouver's rules and Uniform Requirements for Manuscripts submitted to Biomedical Journals: Writing and Editing for Biomedical Publication (4).

In the book "How to teach scientific communication", author F. Peter Woodford pointed out 22 steps in preparing, writing and presenting of the scientific and research investigation (6):

- Ask yourself whether the time is right
- Clarify your conclusions by preparing tables and figures complete with titles and footnotes
- Decide who will be co-authors
- Consider the ethics of scientific publication
- Relate your conclusions to the existing body of knowledge
- Write a working title and abstract

- Choose the target journal and make notes on its instructions to authors
- Define the name of the main sections
- Fill the section files with relevant brief notes in any order, to form „ragbags“
- Range the contents of the ragbags logically
- Finalize the design and content of tables and figures
- Make a topic outline and consider writing a sentence outline
- Write the first draft continuously by collecting references as you go
- See if the first draft needs major alterations
- Have the illustrations prepared in the final form for the target journal
- Polish the prose
- Rewrite the title and structure the abstract
- Request private review by three independent critics and your co-authors
- Re-read the instructions to authors and make any necessary adjustments
- Revise as many times as necessary
- Submit the article to the journal
- Analyze the editor's decision letter and respond appropriately

2. CONTENTS, STRUCTURE AND DISTRIBUTION OF BIOMEDICAL JOURNALS

According to the material that they work on, biomedical journals can be divided into four groups (1, 4, 17, 18):

- Narrow specialized journals;
- General medical journals;
- Classic journals; and
- Primary scientific journals.

Narrow specialized journals commonly deal with materials from a more narrow area of research. They are usually oriented towards one segment of medicine, very often this could be a specific organ or disease,(for example, the journals about diabetes, cancer, AIDS, neurosurgery or similar). These journals usually contain the archive features, they are carefully prepared, strictly reviewed and of high scientific val-

ue. Nowadays, most academic journals are issued on a quarter of a month basis and some every month.

General biomedical journals are intended for a wider circle of users, which are mainly interested in the problems concerning biomedicine and natural sciences. Some examples of the journals are: "Lancet", "Science", "Nature", "Public Health" and others. These journals are published rather frequently, (once in seven or fifteen days). They concern very diverse topics and they are meant not only for the medical practitioners, but also for a wider circle of scientific and research workers. Some of these journals publish important original articles from various specialties, with data of wide interest to the medical public (1). There are a few medical publications that publish actualities from inside the healthcare field or just short news and reports, similar to those of daily newspapers, such as the "Informator", also reside inside this category of journals. This development enables healthcare workers to stay informed and updated. Due to its content, such publications are not listed as primary (1).

Classic journals concern the issues from just one biomedical field. They are published once a month and are considered the forerunners of the first journals.

The primary scientific journals are the part of the scientific literature and the main source of information. They are serial publications, in which, for the first time, "the original research results are reviewed and the scientific articles" are published. Considering that the monotonous criterion for the classification of these journals does not exist, it is hard to establish their exact quantity, but it is assumed that there are around 100,000 in existence, now. The bases for any further calculations of the growth in numbers of these journals, were 10 journals that were being published in 1750. Estimates tell us that every 50 years the number of published journals increases tenfold, thus, the estimate for today is 100,000. The "fading away" of journals is also taken in account. According to

some authors, the number of journals is doubled every 15 years, which amounts to an increase of 5% annually (1). "The Periodicum Biologorum", one of the most famous scientific journals founded in 1886 in Zagreb, was listed among the 4,000 scientific journals that are being processed by the Science Citation Index (SCI). The "Bradford distribution" law states that the most valuable information is published in a relatively small number of journals. According to this law, 8,000 primary scientific journals, instead of 30,000 being published now, would be quite sufficient. Many authors agree that the SCI database confirms this rule, because in a selection of 4,000 journals, it contains a majority of valuable information that is published each year, worldwide.

There are two basic attributes of primary scientific journals: significance and value. We say that it is significant; "if it efficaciously transmits scientific information, if it is readily available to scientists and if they read it." The best measure of the significance of a journal is the ECHO factor, "which shows how much the published articles from a journal are cited" (1, 2). For example, if a journal has an echo factor of 0.10 to 0.30, in a certain period, then, on average 3 to 10 published articles are cited once. In other words, the echo factor tells us how much the journal is used and how important it is for the scientists.

The IMPACT factor shows, "how much a scientific article in a journal is cited on average (8), and it is very similar to the echo factor, which shows how many articles are cited in a journal" (1, 2). The value of a journal is a completely different question, that is to say, it is measured, according to the role of information that is published in it, for the sake of the scientific advancement.

The significance and value of the primary scientific publications usually go together. It is an unusual occurrence that a small journal should publish an article of importance. That is why it is usually suggested that "the echo factor can be taken as an approximate indicator of the scientific value of a journal" (1).

2.1. Quality of primary scientific journals

According to the estimates that researcher Lackovic and collaborators made, (3,8), 10,000 scientific and research publications are published daily in the field of medicine, worldwide. This sky high number is a natural consequence of the scientific progress, but it is also a result of the syndrome called, "publish or perish", which shall represent, the quantitative instead of the qualitative evaluation of the scientific papers. This is the reason, as to why every scientific milieu, no matter how big or small, tries to publish its own medical journal. Often, in the newly initiated journals, not enough attention is paid to the value of the published articles, so that they are acceptable on the international level. The articles should be directed towards the worldwide scientific public and be composed according to its rules. A well known Croatian scientist Silobrhcic (1), the researcher in the field of the biomedical research and scientific information, thinks that "such a journal is the only one that makes sense of publishing, because there is no other way, in which a journal could be edited". This is one of the reasons why, the financing of a vast number of the "scientific" journals, which do not satisfy international standards with their quality, is just an irrational way of emptying the science budget.

The Institute for scientific information in Philadelphia (ISI) publishes the publication titled, "Who is publishing in science – WIPIS", every year. In it, there is a list of authors who had their publications published that year, in the journals included by the ISI. The journals included, are the ones thought to reflect the contemporary scientific – research front. Authors are classified by the countries they come from and by the institutions they work for.

In the majority of developed countries, on every 1,000 researches there are one to two or more journals that are in the SCI. In ex-Yugoslavia the number is 0.18. Also, in developed countries, on every 1,000 re-

searchers there is one international journal, and in ex-Yugoslavia, there is one international journal on every 5,000 researchers. Alongside the development of economy in a country, the rate for the development of science depends also on the specific terms, under which the scientific research is conducted. The scientific productivity of our medical researchers is deemed to be low. An average researcher publishes a work that is easily available to the international public every 5 years, and the ones from university do so every three to four years. Every 1,000 doctors publish six or seven, and those outside clinics and institutes, only 1.1 international clinical papers annually. These statistics are very poor indeed, since, according to the SCI, we are lagging behind Austria, approximately 70 times (1).

The number of published journals in the SCI, from a particular country is not always a reflection of the scientific activity in that country. Many of the indexed journals in highly developed countries are formally international, and the country a journal originates from, is only the country it is being printed in, (i.e. Switzerland is the host publisher of the indexed publications of SZP: "WHO Chronicle", "WHO Technical Report Series", and so on). The highly developed countries also host the biggest publishing houses, such as: "Elsevier Raven Press", "Pergamon Press" and others, which gain considerable profits by publishing international journals. For example, a few hundred international journals, ("Journal of...", "European Journal of...", etc.) are printed in The Netherlands, but that country actually contributes relatively little to the world's knowledge fundus (1). The same is true for Switzerland and other small countries (8).

Some problems present in publishing primary scientific journals are (2, 4):

- The duration;
- Reviews and selection of articles; and
- Expenses.

It is estimated that, on average, the time between the completion of a scientific research and its pub-

lishing in an appropriate primary scientific journal is usually between 24 and 30 months, which depends on the scientific field. In Psychology and natural sciences the time is approximately 12 months (1, 2).

The word "review" is of Latin descent, (i.e. "recensare" which means to examine carefully or to overhaul) and it is the critical representation of a paper. The basic purpose of a review is "the estimation of originality, how scientifically acceptable the manuscript is and the verification of the references regarding relevance, revision and adequacy". During the review, the language (style) of the paper must not be disregarded.

Doing reviews is a very delicate and responsible job, because it is the foundation of the decision about the publication of the paper. Reviewers contribute considerably to the working quality of the paper with their suggestions and marks. A reviewer should answer a few crucial questions (1):

- Is the paper original? (How big is its informational value? / How scientifically important is it?)
- Is it relevant for the majority of the journal readers? (Who is the paper intended for?)
- What results of the applied researches does the paper have to offer?
- What results of experimental researches does the paper have to offer?
What is its practical value?
- Is the level of the presented material acceptable?
- Scientifically, (e.g. the methodology, results overview, discussion, quoting);
- Documentary, (e.g. table and picture quality, statistical evaluation);
- Linguistically, (i.e. intelligibility, terminology validity, stylistic and orthographic order);
- Formally, (i.e. whether the title is corresponding to the content, is the manuscript composed according to the journal's proportions, does it contain all the essential parts, etc.);
- The editorial boards of the better journals usually send questionnaires that their reviewers

must fill out.

In the same way we lag behind the rest of the world in the manuscript quality, we also fall behind in the review quality. Because the reviewer's job "is under appreciated", (e.g. scientific, research and public appreciation); "*reviews are often superficial, slow, biased, flat rated and insufficient*". Reviewers often do a poor job of categorizing articles, due to the fact that they, rather tolerate the "atomizing" of the scientific researches, by which the authors try to "derive" as many original papers as possible, while they do not pay enough attention to the mentioning of co-authorship(s), or the ever increasing cases of falsification of the scientific results. Falsification is a very serious occurrence and represents such a significant problem that the US Congress is investigating that unfortunate phenomenon by utilizing the "MEDLARS" database, which keeps track of the recalled papers. This is why the motto of "publish or perish" is turning into its opposite, "publish and perish", lately. The categorization of articles and the evaluation of the LPU, (e.g. "Least Publishable Unit") are also a part of the reviewers' job, so we will deal with them in more details.

According to Rumboldt (1), all articles in journals can be categorized in five groups:

- Original scientific articles;
- Previous announcements;
- Review articles;
- Scientific meetings' presentations;
- Research articles.

Only original scientific articles, reviews and ordered lectures from the scientific gatherings can be considered to be the true "scientific papers". An article must contain "the original data", (which is a new way to approach a problem, new hypotheses and a way to broaden horizons for the upcoming researches). It must also offer an opportunity to test the results, (which are clearly defined methods of the procedure(s) and replicable results, so it could be proclaimed as "an original". On the other hand, the research articles deal with the facts that are known beforehand, as well as with the known methods on a new test sam-

ples.

Process of distributing the research corpus into smaller parts leads to the phenomenon known as “the scientific inflation” and researcher Garfield attempted to take measures against this undesirable development (1). He retaliates by determining, “the smallest unit of information that is allowed to be published” (e.g. “least publishable unit” – LPU). A reviewer must therefore determine, as to whether an article can be published in the presented form or be incorporated into a bigger announcement.

The decision to decline a manuscript to be published is under the jurisdiction of the reviewer and editor in chief, so that the process of reviewing an article, before it could be published is the key part of journal’s policy. Around 5,000 papers are submitted to the “British Medical Journal”, and only 600 or 12 percent are published. 50 percent of papers go through the reviewing process, while the rest are simply declined, either, because they are considered unoriginal, overly specialized, unintelligible or scientifically insufficient (8).

As of recently, all of the serious international journals have been using a wider international group of reviewers chosen among scientists, judged to be the most competent, in the given branch of science (2). In some countries, the researchers usually write reviews of projects and scientific papers for each other, thereby breaking the autonomy of the evaluation. To lessen such a danger, some journals use the “anonymous reviews” (3).

The delay in announcing the results of a paper depends on the time needed for a quality review, while giving the final touches to a manuscript and it is certainly a lesser evil than a worthless “scientific” hyper production (2, 4).

The matter of expenses that arise in the course of publishing an article must not be ignored, due to the fact that they concern both authors and publishers, equally. The price of a periodic in foreign currency rises annually on a 10-15 percent rate (21). In addition, if we add to that the fact

that a scientist must “buy” 20 to 30 articles, so that he/she could discover those among them that are of real interest to him/her, the problem of expenses gets even more serious. It is estimated that, in average, 17 mail packages are exchanged in the period from the submission of an article and its publication (1). In order to save money, a few medical journals will give honorary payments to the editors and associates. Furthermore, today’s tendency translates into the practice that the authors take either partial or full part in the covering of the expenses, which is deemed to be actually in their best interest (8).

Secondary publications

Intensive and rapid development of biomedical science has led to the production of large quantities of documents and information. At the same time, we can observe the increased demands of scientists and health workers for the “fast, reliable and complete information.” This led to the development of the “secondary publications”, as a guide through the primary literature. As the number of primary publications grew, this development had accelerated the development of the secondary publications, whose basic task was to monitor the rate of appearance and development of the primary publications. Regardless of the forms, the common characteristics of secondary publications are that these publications point to the information provided by the primary publication, (i.e. by providing its description and content), and by facilitating the choice of proper primary publication. “Essentially, secondary publications summarize the primary document and then group the summaries of documents together, according to their professional classification criteria. This allows that significantly reduced space contains higher density of semantically related information, which, in turn, significantly simplifies user’s job.

Individual researcher should now spend a lot of working hours, not to read professional literature, but only to select the titles of articles that should be read. Because of this “information chaos”, on each researcher, one librarian should be

hired, only to perform groupings and selection of potentially relevant articles. This “problem” can usually be solved by the international system of secondary and tertiary publications and computer databases.

Bradford is the first scientist who has scientifically proven that 90 percent of the important research results are published in the relatively small nucleus of the journals and that an attempt to come to 100 percent of the relevant data is almost impossible. Garfield has found that the use of works from certain journals can cause even more selection, as exemplified in – the so-called, “Law of concentration.” That “law” implies that the basic list of 500 to 1,000 journals publishes about 95% of all significant papers (8).

Depending on the manner of describing the primary documents, the secondary publications are divided into the following groups (1):

- index journals;
- index–abstract journals;
- the general and special bibliographies, and
- library catalogues, (e.g. alphabetic, author, research and subject).

Index journals

In biomedical area there are significant numbers of index journals. Among them are the two most famous, “Index Medicus and Current Contents”.

Index Medicus is the oldest secondary publication in the biomedical field, which was founded in 1879, by the John Billings Show, who was the first director of the National Library of Medicine, located in Bethesda, USA “(NLM) from 1865–1895. Index Medicus is considered to be the precursor of all secondary publications. After several changes the current form of Index Medicus came into shape in 1960. Index Medicus analyzes about 3,500 primary biomedical publications, received in the NLM library, in the period of the last 3-6 months before the publication of Index Medicus (1). It is published once a month, or as “a cumulation”, while its content covers a complete biomedical field. Latest information for users of Index Medicus is provided by the „Medical Subject Headings”-(MESH), which

in fact are alphabetically arranged, according to the “MESH” classification rules for the field of biomedical science. The Index Medicus’s user can simply obtain basic bibliographic information about the article or monograph as follows: name and the name of the author, the title of the document and complete information about the source – carriers of the document, then the name of the journals where the document is published, the year, volume number and page number(s) where the document is located. Index Medicus is frequently used in medical practice and physicians consider that the journal is a primary tool in the retrieval of the necessary information.

Every year, in January, (the first) issue of Index Medicus, gives in the separate section the special information for the Index users, such as (1):

- Abbreviation list of journals that handle Index Medicus;
- Complete list of titles of journals;
- The subject headings grouped by broad areas;
- The subject headings grouped by fields in the Index Medicus;
- Register of the author; and
- Special topic bibliography (e.g. pharmacodynamics).

In January issue of Index Medicus thesaurus – dictionary is published, which informs users about the subject that will be handled in the current year (Table 1).

a) MESH Annotated Index	- contains subject alphabetic (session) arranged according to alphabetic order with cross-questionnaires,
b) Tree structures	- branch structure–list of subject guidelines, according to branches, categories and subcategories, hierarchically arranged and numerated up to eight levels.
c) Permuted Index	- Permuted terms index

Table 1. MESH–Medical Subject Headings

Each dictionary represents a different scheme of organizations of terms. Medical Subject Heading (MESH)- thesaurus is the genesis of the development of National Library of Medicine (NLM). MESH is an “up to date” list of biomedical headings that were introduced by researchers of NLM’s during a

continuous monitoring of development of medical terminology, semantics and synonyms. MESH creation was a very active process (1, 2). MESH publishes annually approximately 15,000 index terms and 7,000 synonyms that give about 22,000 descriptors. The last issue of Index Medicus was published in December 2004 (Volume 45). The stated reason for discontinuing the printed publication was that online resources had supplanted it, most especially PubMed, which continues to include the Index as a subset of the journals it covers (1).

Current Contents is the relatively recent Index Journal, which has gained a great reputation, within a very short period of time and it is popular with scholars in the field of biomedical science. It was founded in 1958 by the Institute for Scientific Information of Philadelphia – ISI, Pennsylvania, (USA). It analyzes 4500 primary biomedical publications and informs users about basic bibliographic data, through the “Current Contents”, (i.e. practically immediately after publishing of primary publications (mainly journals)). “Current Contents” is classified into seven sections and it is published weekly. Each of its volumes contain the most important publications in the world and, as such, bring the author(s) index(es) in addition to the address book of authors who should be contacted for full texts. In conclusion, there is also the subject index consisting of the keywords from the titles of each article (8). Current Contents/Clinical Medicine® provides easy access to the complete tables of contents, abstracts, bibliographic information and all other significant items in recently published editions of over 1,120 leading biomedical Journals. The web version titled the “Current Contents Connect”, offers daily updates and data from evaluated web sites and documents.

In this way, users in the biomedical science are promptly informed about the latest documents and information from the immediate area of their interest. Unlike the Index Medicus that selects articles, according to the opinion of specialists: (i.e.

doctors, librarians and editor(s) of the journal(s)), Current Contents bases its selection, primarily according to the frequency of their citations, (i.e. according to the impact factor–(IF)).

Index–abstract journals

This category of journals, in addition to the bibliographic data, offers the user a brief “abstract” (summary). In the literature for this kind of journals, other terms, such as: (i.e. bibliographic–references, bibliographies–abstracts are used, which, in essence, have the same meaning). Short summary – abstracts, from the primary publications of the original authors’ articles are sufficient for the users to understand the essence of the authors’ messages. Recently, indexed–abstract journals have become more attractive, because, due to the nature of financial difficulties, the printing of complete primary documents becomes quite a difficult proposition (14).

The first journal of this kind has been printed long ago, in 1830, and today there are 3000 such journals world wide. At the same time, around 500 indexed – abstract-journals are published in the biomedical field.

Excerpta Medica or journal abstracts, (“Abstract Journal”) is an indexed – abstract-journal with the highest reputation, which now attracts the majority of users within the biomedical field. It is published by the “Elsevier Science Publishers, a Dutch company from Amsterdam, which begun publishing from 1946 on. Typical for this journal is that it is quite expensive, but in return offers the abstracts as the supplements to the bibliographic data, and therefore has a big advantage when compared to other journals of this kind. Finding information for users is facilitated by “Excerpta Medica”, published by sections or the professions. At the end of each volume, the “cumulative number” is given. That number gives an overview of the whole sum of matter treated in all issues of the same volume. Today, the journal analyzes, either totally or selectively, around 3500 primary publications in the field of biomedical science.

The Search Criteria is utilized by the topic, the significance of the article and its contained information. In preparing of summaries, about 4,000 associates are involved around the world, including well known researchers in the specific areas, who are familiar with the language in which the article was written (8, 14). “Medicinskij referativnij” journal, is by its very conception, very similar with the journal “Excerpta Medica”. This journal was launched by the Ministry of Health of the USSR in 1957. Similarly to Excerpta Medica, it is published by sections – professions, (i.e. “Russian razdeli”), and analyzes 2500 primary publications in the field of biomedical science. In a similar fashion, like Excerpta Medica, along with the basic bibliographic information, this journal publishes short abstracts- (summaries).

Undoubtedly, the abstract-indexed journals are used today in the world, and even in a certain sense they determine the fate of the primary publications. Thanks to the abstracts of articles that are published in these journals, searching and reading of journals, in which these articles were published can be improved.

Below listed types of publications belong in this category (i.e. specific literature, encyclopedia, manuals, dictionaries, lexicons, etc.). This bibliography does not have the importance, which is usually given to the secondary publications (some of them are called “tertiary publications”) (1, 8). It is important to note that for the most of the users, these publications ensure faster, easier and more immediate access to the scientific and technical information. These publications are more used for consultation in the process of information retrieval.

Indexed–Citation Journals

The most famous indexed–Journal is “Citation’s Science Citation Index (SCI)”, which has been issued by the Institute for Scientific Information (ISI), since 1964. Science Citation Index (SCI) is a list of scientific texts from all over the world. It displays the information about the author, the title, the subject, etc. for each scientific paper. All this in-

formation is taken from more than 4,000 of scientific journals. SCI is based on the concept of indexing citations of the literature quoted in some scientific papers. It contains four interconnected indices (1, 8):

- Citation Index” – organized in alphabetical order of cited authors or chronological order of their cited papers. Every author and his article are quoted as the statement list of authors, the title, subject etc.
- “Source Index”– brings all newly published papers, with the first authors’ names, according to the alphabetical order, in the processed journals for the certain year of indexing;
- “Permuterm Subject Index”– creates a permutation of the words, according to their meaning from the title articles that are contained in the Source Index;
- “Corporative Index”– includes the geographical and organizational section and then sorts the authors of works that are covered by the Source Index, according to the states, cities and organizations, in which the authors work.

SCI is very important source for the “Scientometrics research” ,in the framework of Scientometrics, “which is defined as a quantitative process of studying the science of the information’s significance” (3). Specifically, SCI publishes a large number of information on authors, institutions, countries, etc. (8).

HistCite Software

HistCite is a software to aid researchers in visualizing the results of literature searches in the *Web of Science*. HistCite lets one analyze and organize the results of a search to obtain various views of the topic’s structure, history, and relationships. It is easy way to provides perspectives and information not otherwise available (18).

HistCite is a software implementation of *algorithmic historiography*, and has been developed by Dr Eugene Garfield, founder of the Institute for Scientific Information and the inventor of the Science Citation Index®. The main purpose of this software is to make it easier for in-

dividuals to perform bibliometric analysis and visualization tasks. Bibliometric analysis is the use of the bibliographic information (titles, authors, dates, author addresses, references, etc.) that describes published items to measure and otherwise study various aspects of a specific field of scholarly endeavor.

Frequent questions asked by bibliometricians and others that can be answered by HistCite analysis are: How much literature has been published in this field? When and in what countries has it been published? What countries are the major contributors to this field? What are the languages most frequently used by the items published in this field? Who are the key authors in this field? What institutions do these authors represent? Which articles are the most important? The answers to such questions are valuable to researchers, librarians, and administrators.

This software can be downloaded free of charge at Thomson Reuter’s web site. To take full advantage of the software’s features you will need access to the *Web of Sciences*. To learn more about HistCite visit their Web Site at <http://www.histcite.com>.

3. BASIC COMPONENTS OF THE SCIENTIFIC ARTICLE

3.1. Title of the article

Title of the paper/article contains a set of terms in the shortest form describing the content of the scientific research. Title has a function, which accurately describes the content of the paper. There are two types of titles: Indicative title – is the type of title about the work that covers, for example, “Treatment of mild and moderate inflammation of the urinary bladder with Bactrim tablets”. An informative title – represents the type of title where one sentence conveys the message of the article and it is recommended for the beginners. In this case, the article conveys the message to the reader about all the major elements–,such as “One drug in a combination with another drug is effective in treating a mild and moderate forms of the disease, although it seems that

only the first medicine implies to be working” (1, 2, 3).

When writing the article, the title should be borne in mind, so that the reader understands the title through the prism of their past experiences and knowledge. Also, the title tends to animate readers to take an interest in this topic and that the he or she wants to read the paper. Title can be viewed as „a summary of the summary“. The title is formed to meet all the requirements that are necessary and that were the subject of the research. Often, the process of thinking about the title is long and tedious, because it is difficult to satisfy „its demands“.

A good title should be: a) the shortest possible, the most in two rows and less than 100 characters, b) correct, and must not imply to deceive or confuse; c) clear, because the reader does not wonder what it means, d) the shortest possible, but the most complete, e) to inform and d) to attract attention, in order to be easily remembered.

A good title should have the following characteristics: a) contains the main characteristics of the article, b) shows what is of the utmost importance in the work, c) uses the same terms as: the purpose, methodology or results d) does not contain any abbreviations and d) may be in the form of question.

3.2. Authors of the article

Under the title of the paper, it outlines the names of the authors or researchers who have created work that is accomplished by the research. The real author is listed immediately below the title's work and other investigators who also participated in the survey may be indicated either at the end of the work, or in the credits.

3.3. Affiliations of authors

They are listed, in order to represent the author of the work and co-authors. In particular, they contain the information about the correspondent, with the editorial board, which communicates as needed, or are interested in seeking an article in its entirety (in extenso).

3.4. Summary

As in the title, the abstract also has two modes:

- Indicative, which are extremely rare in practice and
- Informational.

The summary is written in the national and English version, (such as Abstract or Summary), where each part of the article should be represented with a few sentences. For clinical studies' journals, we often want a more detailed summary structure, which consists of: a) introduction, b) goal, c) subjects and working methods, d) the place of study, e) measure of the study's outcome(s), f) results of the study and g) conclusions. Such a summary view is important to convey your message to the reader, in the clearest possible terms. Sometimes, the summary is, for example, omitted in the editorial. Most of the indexed journals give their instructions with the examples, as to how to write a SUMMARY/ABSTRACT.

Summary (U.S. abstract) presents a concise distillation of the article and, as such, should emphasize what was done, the way it is done, how and what results were obtained and the author's interpretation. Abstracts will be acceptable if they are precise and clear. The acronym "KISS" means, „Keep it Simple and Succinct“, and, as such, it is an excellent guideline for the summary writing. Its length is determined by the organizer of the meeting/journal. Typically they are 200-250 words or one typed A4 page of double spaced text long.

Summary is: a) a distillate of what will be presented and must be shown, b) what has been done; c) how it was done; d) what are the results and e) what the results mean.

Abstracts must be grammatically correct in punctuation and writing and that means: a.) a written text must be free of grammatical and spelling errors, b.) to observe the commas and word order and c.) the final text must be edited.

The abstract should: a) be written as short, b) preserve the integrity of each part of the summary; c) avoid mixing parts: (i.e. material and methods with results and

conclusions) and d) avoid (approximate) terms: (e.g. work in progress, is about to be done, the results will be displayed, etc.)

With every subsequent redaction, (the subsequent checks of the summary text), the abstract gets better, shorter, clearer, and it is recommended to start with summary writing „before“ and not “a day before” the deadline for its submission.

Each abstract must have its constituent parts, well linked into one logical unit: a) Title, b) Introduction c) Materials and Methods, d) Results and e) Conclusions. When creating a summary the order is not important. It is only important that, at the end, the summary contains all necessary elements.

3.5. Introduction

Introduction should be comprehensive and must gradually introduce the reader(s) to the core of future topics and parts/facts that will later be thoroughly analyzed and described in a paper. Introduction is very important part of the text, because it gives insight into the skill of the author, as the researcher and the narrator. Introduction shows the general part of the paper, (wide context), it communicates what it is already known and what is not yet known, the problems, according to the hypotheses and what the author(s) want/s to investigate. There are the following rules as to what to write in the introduction:

- Clearly define the issue that attempts to answer,
- It should be stated as to why the investigation began,
- There is no need to explain what can be found in any textbook,
- Do not need to explain terms from the title.

Authors should write in the present time. Introduction should be brief and clear, with a maximum of two or three-sentence of introduction. It must also introduce the reader to the subject of the research. The introduction is usually given to the definition of a problem or writes a short history compared to the previously published results of a test, experiment or treatment of the pa-

tient, include the interpretation of abbreviations and it ought to determine the objective/s of the research.

- Basic rules for writing an introduction
- Must be focused to the definitions of certain problem,
- Should indicate the review and the meaning of the abbreviation(s),
- Specify the purpose/s of the research.
- The main role of the introduction
- To clearly show what is the part of the problem,
- To highlight why this particular part is investigated,
- To motivate the reader to read the text.
- The meaning of the introduction is:
- To facilitate the reading of the text,
- To be short, because, if it is too long, the introduction can imply that it was written by those who wish to show that they have done a lot of reading.

The meaning of the introduction is to facilitate the reading of the text and to prepare readers to easily review the methods, results and conclusions. Never allow the introduction to be too broad. Introduction should be written, so that it stimulates the reader to read it.

3.6. Materials and methods

The chapter “Material and Methods” describes how the research is to be conducted and the research subjects (respondents), which in clinical trials are represented, by either sick and/or healthy people. It is very important and significant to examine in detail and describe the subjects included in the study/research, so that the degree of variation between subjects became more visible. Specifically, the research must be a complex study of selected subjects per cohort, and must be conducted under very strict criteria, in order to avoid the effect of individual variation. Ethical standards for consent of subjects must be included in the work and participants must give their informed consent. Materials and Methods must describe all types of medications, treatments,

laboratory diagnosis, diagnosis and they depend upon the topic of work, definitions and goals/objectives of the research. It also alleges, as to which group of subjects the focus should be on. Finally, it characterizes the work and timing, which was performed in the clinic/institute/laboratory as the source of data. In conclusion, it gives an overview of all procedures that are related to a selected group of patients, particularly the new ones, which should be described in more detail, including as to how to assess their validity. Part of the chapter that tells about the material that was used and the methods used must be fairly comprehensive. Its content must answer important questions. It should be written in the past tense.

- It is necessary to explain what was studied, asked and evaluated, as follows:
- Sampling method (random, consecutive and/or representative),
- Sample size (patient: gender, age),
- Criteria for exclusion from the study,
- What is the control group—if there is one.
- Should describe how the research was done:
- Type of the study: *a) prospective, b) retrospective and/or c) combined.*
- What are the methods of data collection: *a) survey, b) a list and/or c) the control examination.*
- What was the technique for measuring results: *a) surgical treatments and/or b) laboratory tests.*

It is necessary to specify where the research was done, that is the territorial framework of studies of patients’ city area, canton, at the international level, or, institution or institutions, in which the testing was conducted.

3.7. Results

The main goal of the scientific or professional article is to show the results. That is also the most important part of the text, whether it is written on the laboratory research, experimental research or clinical study. The research results, as a rule, are part of the article to be read the most carefully, so it should be: a)

elaborated, b) well documented and/or c) at the optimal dose.

The results are showing new findings of the study and follow the logic of the research. In this section all respondents are to be described, (those who entered the initial group and all who for some reason were excluded). Often, the calculated results show – the ratio of the initial group as compared to the other group of respondents who finished the study. Then it presents the findings and the differences of the experimental groups. This section also provides a concise and logical story on the results. Text cannot recount the results from tables and figures, but should give a summary and critical review of important findings. It is important that the results are shown in only one way, (i.e. a figure or text and not in several ways).

- The results should be displayed in the following way:
- Measurements must be clearly defined,

Instead of a multitude of descriptive sentences, make easy-to-read tables and charts, levels of statistical significance must be clearly defined (e.g. $p < 0.5$).

3.8. Discussion

The essence of the discussion is the critical review of the data described in the results, where, after summarizing, the results are needed to determine the limits and deviations. The results need to be compared with other findings and to discuss the theoretical and practical implications of the research. Conclusions must be made carefully and they should propose the future research. They should show what is new in the research and how its results fit into the wider area, which is the described in the beginning of the article in the Introduction.

3.9. Conclusion

The conclusion is the logical conclusion of what are the results of a work. Experienced readers, typically, read the conclusions immediately after the title and later decide whether to read the entire summary. Therefore, the conclusions of the work must be short, clear, pre-

cise, and/or be the final statement of what logically follows from the results of the work. Only then we should single out only the most important parts and give a message.

Conclusions are written so that they: a) must respond to the issues raised through the introduction, goals and general work setting, b) do not need to recount and repeat the results and c) must be clear and concise and written in the present tense. **Good conclusions** should not surprise a careful reader of the text; on the contrary, the reader should get the impression from the conclusions that he would write them as such.

3.10. References

Literature serves as the representation of the author's inspiration, and also provides us with an insight of how the author is really interested in its topic(s). However, it often happens that authors lose the thread in the process of writing of their work. To write a scientific paper should be a: God's gift for writing, knowledge and/or experience. No one can write an article in one night, the writing requires weeks or even months. In order that certain article(s) is/are written, it/they also require(s) an extensive literature and the knowledge so the article(s) contain style, spirituality and harmony that capture the reader. Quality articles are usually created in cooperation with the capable mentors who will suggest how to start, implement and prepare them for the final publication. Specifying (citation) references, in the paper (the article), must be in accordance with instructions which, as a rule, are enclosed in the magazines or other publications indexed in printed or electronic form. The most commonly used are the Vancouver Convention's rules for citing literature and some ask to apply Harvard University's Convention citations (author and year of publication).

4. PRESENTATION OF THE ARTICLE

There are certain rules to be followed in the preparation and presentation in order for the presen-

tation to be successful. Opinions vary, on whether the work should be read during the presentation or not. There is a dilemma, whether the speaker should carry the written manuscript on stage or written notes. For instance, the Surgical Research Society in the UK prohibits the use of the manuscript. It is allowed to be used only if the presentation is in a foreign language. In the U.S. the presentations, even at the national conventions are often read from the manuscripts. Opinions on this issue are still divided. However, the prevailing attitude is that the work is read only, if the language, in which the work is presented, is not native.

Rules to follow during the presentation are as follows: a) should be borne in mind that the presentation of the work is not the manuscript to be read at the Congress, b) do not need to say all that was written in the paper during the presentation, c) leave something to users/participants to read by themselves, which is not to be boring, d) it should be an interesting presentation and e) use modern tools, paints, animation, sound, video and CD.

Duties of speakers during the presentation are to explain:

a.) Why the paper is written (the Aims), b.) What was done (the Material and Methods); c.) What was the obtained response (the Results) and d.) what it actually means (the Conclusion)? Slides for the presentation must be well designed, concise, clear (with the message), with easy to read background as well as large and legible letters and numbers.

Sequence of the presentation is very important. In principle, one should observe the following sequence: a) make a brief introduction, b) describe the material and methods, c) give an overview of the results, d) give the message—the conclusion.

Frequent errors during the presentation are: a.) the speech is usually too long (time factor), b.) unclear presentation (language, terminology and/or acronyms), c.) redundancy in the presentation of work (introduction, materials and/or methods) and d.) insignificant con-

clusion (conclusion must be specific, clear and prominent).

The main goal is to follow the following rules at the presentation of the article: It is necessary to speak slowly, to avoid unusual words and acronyms, (to give listeners the obvious examples, interpret results and not only offer to the audience the mass of numbers), not to rush at a presentation, but rather, to leave something for the discussion. It is essential not to forget that public's attention should be focused on work and not to look at the speaker. However, the visual impression that the speaker leaves is very important. People often unconsciously associate the poorly presentable individuals, as careless in work and vice versa. On the contrary, the ones who look decent, even before they began speaking are usually respected. Experience shows that the words give the impression in 7 percent of cases, 38 percent is given out by the voice, while face and body contribute up to 55 percent of the total perception. During presentation, the work should flow seamlessly, (i.e. presentation effort should take care by itself) by maintaining the professional attitude, position, gestures and visual contact with the audience.

5. JOURNALS IN B&H

In the former Yugoslavia first medical journal was „Domestic physician“ (Domaci lekar): journal for cherishing and safeguarding public health, published in Pancevo 1971-73. The first scientific journal was the Serbian archives for all physicians (established in Belgrade, 1874). In Croatia was established in 1877 the Medical News Journal (Medicinski vjesnik), as part of the Association of physicians in Slavonia and the Croatia Kingdom. In Ljubljana in 1929 was published Health News (Zdravstveni vestnik). In Sarajevo in 1947 the Medical Archives (Medicinski arhiv), Journal of the Medical Assembly of B&H physicians. Jahrbuch des Bosnisch-Herzegowinischen Landesspitals in Sarajevo - Annual of the National Hospital in Sarajevo which was established in 1897 (published in German) was the oldest medical journal in B&H.

Name of journal	ISSN number	Publisher	Editor-in-Chief	Web site	Founded	Per year	Peer reviewed	Type of journal	Language	Indexed in
Acta Informatica Medica	0353-8109	Avicena Sarajevo	Izet Masic	www.amn.ba	1993	4x	Yes	Scientific	English	EBSCO, IC
Acta Medica Academica	1840-1848	ANUBiH	Berislav Topic	www.anubih.ba	2008	4x	yes	Scientific	English	EBSCO, IC, CAB Abstracts
Acta Medica Saliniana	0350-364X	UKC Tuzla	Harun Brkic	www.ukctuzla.ba	1972	4x	Yes	Scientific	Bosnian/English	EBSCO, IC
Bosnian Journal of Basic Medical Sciences	1840-4812	Association of Basic Medical Sciences of FBiH	Bakir Mehic	www.unsamf.ba	1998	4x	Yes	Scientific	English	PubMed, EBSCO, IC
Folia Medica Facultytis Mediciniae Universitatis Saraeviensis	0352-9630	Faculty of medicine Sarajevo	Nedžad Mulabegovic	www.mfunsa.ba	1966	2x	Yes	Scientific	Bosnian/English	IC
Health Med	ISSN 1840-2291	Faculty of Health Sciences Sarajevo	Mensura Kudumovic	health_med@yahoo.com	2007	4x	Yes	Scientific	Bosnian/English	SCI, ISI Web of Science, EBSCO, IC
Materia Socio Medica	1512-7689	Avicena, Sarajevo	Izet Masic	www.amn.ba	1978	4x	Yes	Scientific	English	EBSCO, IC
Medicinski Arhiv	0350-199X	Avicena, Sarajevo	Izet Masic	www.amn.ba	1947	6x	Yes	Scientific	English	Medline, EBSCO, IC
Medicinski Glasnik	1840-0132	Medical Association of Zenica-Doboj Canton	Selma Uzunovic-Kamberovic	www.ljkzedo.ba	2004	4x	Yes	Scientific	Bosnian/English	Medline, EMBASE, SCI
Medicinski zurnal	1512-5866	Clinical center of University of Sarajevo	Mirza Dilic	institutnir@bih.net.ba	1995	4x	Yes	Professional	Bosnian/English	EBSCO
Medicinar	1840-3697	Medical Association of SBK, Travnik	Nedžad Hadzic		2004	2x	NO	Professional	Bosnian	NO
MediCom	0480-2551	MediCom, Banja Luka	Momir Pusac	www.medicom.com	2004	4x	NO	Professional	Serbian	NO
Pedijatrija Danas	1840-2968	Pediatric clinic of University of Tuzla	Husref Tahirovic	Husref.tahirovic@untz.ba	2005	4x	Yes	Professional	Bosnian/English	EBSCO, CAB Abstracts
Pharmacia	0480-2551	Association of Pharmacists	Miroslav Sober	Miro.sober@gmail.com	1990	1x	NO	Professional	Bosnian/English	NO

Table 2. Indexed journals in Bosnia and Herzegovina in the year the 2011

In 1987 in the former Yugoslavia during 140 scientific and professional journals was published in the field of medicine and similar disciplines, of which in B&H 39 (1). From this number only 30 of them were involved in secondary and tertiary indexed publications (from

B&H only Medical Archives and Folia Anatomica Iugoslavica). According to ISI Philadelphia, which each year publishes the publication "Who is publishing in science - WIPIS" in 1979 from former Yugoslav countries, was registered more than 60 authors who have their works

published two or three times in the indexed journals, and in Garfield list of 1000 most cited authors until 1984 there was not an author from the former Yugoslavia, but Yugoslavia was a country with the largest number of academicians to population, and of 1000 researchers was about 0.18 journals or one journal on 5000 researchers, while the number in developed countries was 1.2 journals on 1000 researchers.

In December 2009 within the databases of indexed biomedical literature were recorded 19.3 million cited papers. From the cities of the former Yugoslavia was cited the articles of scientists and researchers in the following figures: Zagreb - 5002, Ljubljana - 4097, Beograd - 2598, Nis - 959, Rijeka - 687 Split - 609, Sarajevo - 563, Skopje - 332, Maribor - 301, Osijek - 297, Tuzla - 240, Kragujevac - 231, Subotica - 93, Pristina - 75, Mostar - 70, Banja Luka - 20, Podgori-

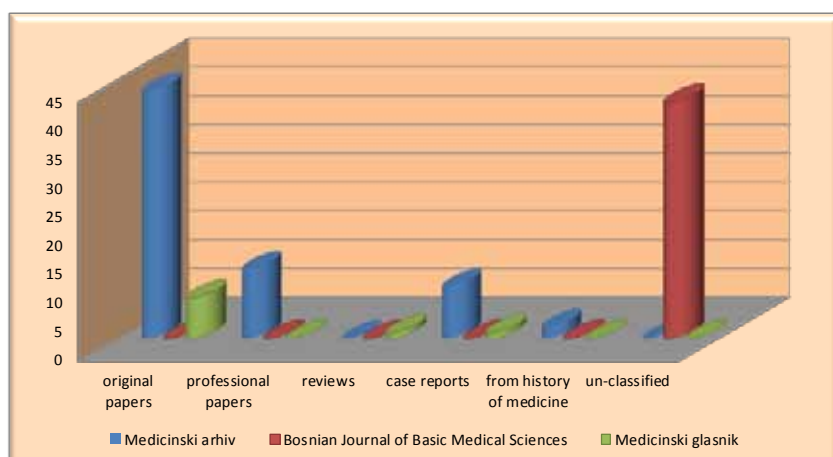


Figure 1. Distribution of the published articles in three indexed B&H journals in PubMed/Medline in 2010

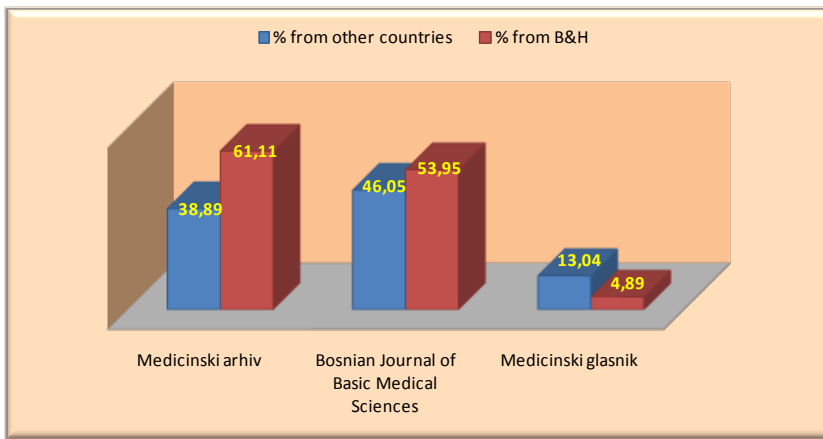


Figure 2. The ratio of published articles by domestic or international authors in journals in Medline

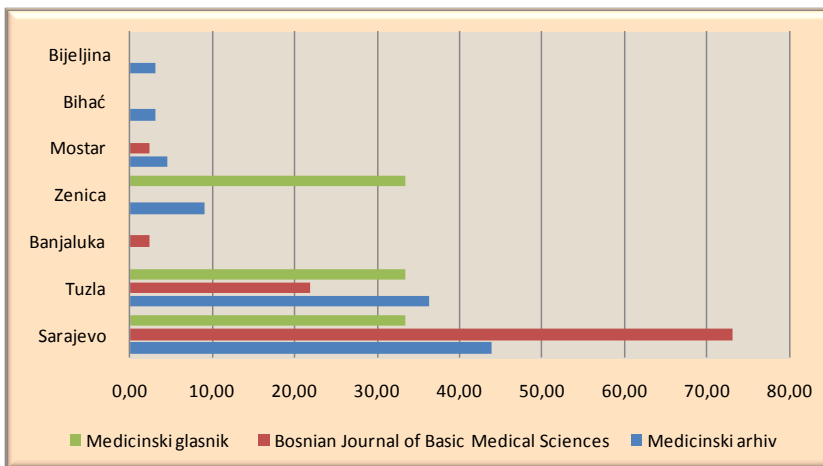


Figure 3. The ratio of published articles in the journals indexed in Medline by authors in B&H centers

ca - 9, Bihać - 5. So it means, from the following cities: Sarajevo, Tuzla, Banja Luka, Mostar and Bihać - five university centers in B&H, in PubMed/Medline database in late 2009 there was 898 cited articles from the primary scientific journals, which is 7.3 times less than in Croatia, 4.9 times less than in Slovenia and 4.3 times less than in Serbia.

Currently in B&H is published 14 scientific and professional journals and to 3 are indexed in PubMed, 3 in ISI Web Knowledge, 1 in EMBASE, 9 in EBSCO database, 8 in Index Copernicus - IC based, 2 in CAB abstracts, etc. (Table 2).

During 2006 in the oldest Medical Faculty in B&H worked 32 full time professors (they had 543 articles cited in PubMed, of which 508 were published in local languages and 35 in international journals), which is in average 16 papers in domestic or 1.1 articles in international journals. Associate professors of the Medical Faculty in Sarajevo published during the same year 495 sci-

entific and professional articles, cited in PubMed, of which 31 in international journals. Assistant professors (33 of them) published 374 articles cited in PubMed, of which 15 published in international journals. Also given is the comparative review on the number and structure of papers published in B&H journals, which are listed in PubMed.

Analyzed are three B&H journals indexed in MEDLINE database: Medical Archives (Medicinski Arhiv), Bosnian Journal of Basic Medical Sciences (BJBMS) and Medical Gazette (Medicinski Glasnik) in 2010. As shown in Figure 2 the largest number of original papers was published in the Medical Archives (Chi square - 130.646, DF 10, significance level $p < 0.0001$, contingency coefficient - 0.728). there is a statistically significant difference in the number of papers published by local authors in relation to international journals in favor of the Medical Archives (Chi-square - 11.644, DF-2, Significance level - $p = 0.0030$, Conti-

gency coefficient-0, 226). True, the Journal BJBMS does not categorize the articles and we could not make comparisons. Journal Medical Archives and BJBMS by percentage published the largest number of articles by authors from Sarajevo and Tuzla, the two oldest and largest university medical centers in B&H. The author believes that it is necessary to make qualitative changes in the reception and reviewing of papers for publication in B&H medical journals which should be the responsibility of the separate scientific authority/committee composed of experts in the field of medicine at the state level.

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