Survey of Keyword Adjustment of Published Articles Medical Subject Headings in Journal of Mazandaran University of Medical Sciences (2009-2010)

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Original paper
ABSTRACT
Introduction: Keywords are the most important tools for Information retrieval. They are usually used for retrieval of articles based on contents of information reserved from printed and electronic resources. Retrieval of appropriate keywords from Medical Subject Headings (MeSH) can impact with exact, correctness and short time on information retrieval. Regarding the above mentioned matters, this study was done to compare the Latin keywords was in the articles published in the Journal of Mazandaran University of Medical Sciences. **Method:** This is a descriptive study. The data were extracted from the key words of Englsih abstracts of articles published in the years 2009–2010 in the Journal of Mazandaran University of Medical Sciences by census method. Checklist of data collection is designed, based on research objectives and literature review which has face validity. Compliance rate in this study was to determine if the keywords cited in this article as a full subject of the main subject headings in a MeSH (Bold and the selected word) is a perfect adjustment. If keywords were cited in the article but the main heading is not discussed in the following main topics to be discussed with reference to See and See related it has considered has partial adjustment. **Results:** Out of 148 articles published in 12 issues in proposed time of studying, 72 research papers were analyzed. The average numbers of authors in each article were 4 ± 1. Results showed that most of specialty papers 42 (58.4%), belonging to the (Department of Clinical Sciences) School of Medicine, 11 (15.3%) Basic Science, 6(8.4%) Pharmacy, Nursing and Midwifery 5(6.9%), 4(5.5%) Health, paramedical Sciences 3(4.2%), and non **medical** article 1(1.3%) school of medicine. In general, results showed that 80 (30%) of key words have been used to complete the adjustment. Also, only 1(1.4%) had complete adjustment with all the MeSH key words and in 8 articles(11.4%) key words of had no adjustment with MeSH. **Conclusion:** The results showed that only 17 articles could be retrieved if the search words are selected from the MeSH. In this case the expected 100% of published articles titles at this university the validity of exchange of research projects which is something noteworthy. The lack of correlation between number of authors and matching of Keywords with MeSH, may mean all of the papers' authors did not take part in writing and it is understanding that only one author wrote the paper. **Key words:** Abstracting and Indexing as Topic, Information Storage and Retrieval, MEDLINE, Medical Subject Headings, PubMed, Information Services, Iran

1. INTRODUCTION

Medical Subject Headings
1. Entry Terms

Entry terms, sometimes called "See cross-references" in printed listings, are synonyms, alternate forms, and other closely related terms in a given MeSH record that are generally used interchangeably with the preferred term for the purposes of indexing and retrieval, thus increasing the access points to MeSH-indexed data. Entry terms range from variations in form such as *Heart Arrest* and *Arrest, Heart* to substantial synonyms such as *Heart Arrest* and *Asystole*. Entry Terms are displayed as the **Entry Term** in the MeSH Browser, and exist as the <Term> element in XML MeSH. Entry terms are not always strictly synonymous with the preferred term in the record or with each other. However, for the purpose of organizing the NLM-indexed literature, fine granularity is not always required, so the entry terms are equivalent to the preferred term for purposes of indexing and retrieval. Note, however, XML MeSH does identify strict synonymy between subsets of terms within a record. See the <Concept> element in XML MeSH and Concept Structure in XML MeSH Data.

2. OTHER CROSS-REFERENCES

Three kinds of informative references suggest other Descriptor s in MeSH that relate to the subject and that may be useful in indexing, cataloging, or searching a particular topic.

See related references, also known as "associative relationships" are used for a variety of relationships between descriptor records where a user of one descriptor is reminded of an-

other descriptor which may be more appropriate for a particular purpose. For example, the relationship may be between a disease and its cause:

- Factor XIII Deficiency **sees related** Factor XIIIa, Or between an organ and a physiological process, Bone and Bones **see related** Osteogenesis, Or between an organ and drug acting on it:, Bronchi **see related** Bronchoconstrictor Agents, Or between an organ and a procedure, Bile Ducts **see related** Cholangiography, In the MeSH Browser the See Related reference is displayed as **See Also**, and is the <SeeRelatedDescriptor> element in XML MeSH. For further discussion see Relationships in Medical Subject Headings.

Reference to other Descriptor s having related linguistic roots, for example: Brain **consider also** terms at CEREBR- and ENCEPHAL. The Consider Also reference is used is primarily with anatomical Descriptor s to refer to groups of Descriptor s beginning with a common stem rather than to a single Descriptor . In the MeSH Browser the reference is displayed as **Consider Also**, and as the <ConsiderAlso> element in XML MeSH.

In some NLM systems using MeSH, certain Descriptor /Qualifier combinations are prohibited by a special MeSH data element called the <EntryCombination> in XML MeSH, and **Entry Combination** in the MeSH Browser. For example, the Descriptor *Accidents* cannot be used with the Qualifier *prevention & control*, but instead of this combination, the Descriptor *Accident Prevention* should be used.

In some thesauri the function cross references to broader and narrower terms is comparable to the hierarchical relationships in the MeSH Tree Structures, though hierarchies enable multiple levels of specificity, as do the MeSH Trees. These relationships are displayed graphically in the MeSH Browser and the online MeSH Tree Structures. The Trees data are also used by PubMed for the default behavior of inclusive searching. The Trees data in XML MeSH are to be found in the TreeNumber element. (Medical Subject Headings)

Using of medical information is not easily feasible without the knowledge of bibliographical tools. Meical Subject Headings (MeSH) is the famous medical Thesarus which is published in two formats of print and online. It is used for indexing of articles, cataloging of books and non printed materials and also for information retrieval from Information data bases in medical libraries. MeSH is the first main designed thesaurus for using in machine system and fundamental requirements of a controlled vocabulary such as tree structure; broad referral structure, textual definition, and reliable updating of MeSH, and even information of Medline Data base which it is unique, is indexed by controlled vocabulary of MeSH (1). Pubmed, Entrez, and Medline are used from descriptors of MeSH for retrieving of information. Using of MeSH data base for defining of interest is the most useful for developing of quality of searching. Recent years have witnessed an increasing number of research centers and universities. Which could publish number of articles in different indexed (2) Therefore, how to organize them in databases are considered. However, a prerequisite to a new study of published articles on the subject is available. Therefore, a researcher must be able to search for other articles of organizing of the draft proposal of his/her study. In the past, access to the other papers was very difficult and expensive, but with the advent of new electronic technologies, retrieval of them became easier.

The first step in retrieving of paper is using the key word. Literature search is an important part of any research, and publication activity[1]. In the era of electronic database and explosion of scientific publication, keywords play an immense role in digging out the relevant published material, since these keywords act as "keys" to unlock the desired scientific paper abstracts/full articles from a vast collection of related publications[2]. Hence it is important to include and select related keywords which can easily recognize and search relevant references and filter-out the large body of unwanted material. It is, therefore, important that certain words may be added to the abstract of the article which a future researcher might be expected to use as key-words in MEDLINE search. These words should be such that they would make an article which might have remained invisible to the researcher visible on search[3].

Results of using good and appropriate key words from the subject content of an article, is time-proving for accessing to the paper. In other words, in an article on the Internet with the use of these terms will be permanent, even if the author himself never to be absent from the internet (3).

But, if the papers have been published without appropriate and standard keywords, the researcher did not know searching skills and methods of information retrieval, or did not familiar with retrieval tools, Therefore, he or she will encounter with difficult procedure and in some cases with a much time and without good result.

PubMed is a free database accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics. The United States National Library of Medicine (NLM) at the National Institutes of Health maintains the database as part of the Entrez information retrieval system. PubMed was first released in January 1996.

Medical Subject Headings (MeSH) is a comprehensive controlled vocabulary for the purpose of indexing journal articles and books in the life sciences; it can also serve as a thesaurus that facilitates searching. Created and updated by the United States National Library of Medicine (NLM), it is used by the MEDLINE/PubMed article database and by NLM's catalog of book holdings.

MeSH was introduced in 1963[4]. The yearly printed version was discontinued in 2007 and MeSH is now available online only.[2] It can be browsed and downloaded free of charge through PubMed. Originally in English, MeSH has been translated into numerous other languages and allows retrieval of documents from different languages.

Fact Sheet
Medical   Subject   Headings

(**MeSH®**) a classification system for analytical cataloging of books, periodicals, audiovisual materials and articles published in the Medical Subject Headings From 1940 to Pubmed database has been prepared.(4) It is obvious that as the number of sources is added to the database, easy access to them is more important to, therefore, The creators of the data base for creating a systematic structure for the classification of articles found that data base can facilitate retrieval of materials(5). Methods have chosen for term papers and medical terminology, the choice of words, which is referred to as synonyms vocabularies (6). Therefore, the researcher should use to MeSH terms for re trieving desired subject article. Meanwhile, this system because of its controlled vocabulary, has high search caPabilities followed up with the least amount of time. On the other hand, Impact factor, an index based on the frequency with which a journal's articles are cited in scientific publications, is a putative marker of journal quality.

Saha, S., Saint, S., & Christakis, D. A. (2003). Impact factor: a valid measure of journal quality?. *Journal of the Medical Library Association*, *91*(1), 42.

Peer Bork et. al believed that; to date (2003), many of the methods for information extraction of biological information from scientific articles are restricted to the abstract of the article. However, full text articles in electronic version, which offer larger sources of data, are currently available. Several questions arise as to whether the effort of scanning full text articles is worthy, or whether the information that can be extracted from the different sections of an article can be relevant. In their work, they addressed those questions showing that the keyword content of the different sections of a standard scientific article (abstract, introduction, methods, results, and discussion) is very heterogeneous. They concluded that, although the abstract contains the best ratio of keywords per total of words, other sections of the article may be a better source of biologically relevant data

Shah, Parantu, Perez-Iratxeta, Carolina, Bork, Peer, & Andrade, Miguel. (2003). Information extrac-

tion from full text scientific articles: Where are the keywords? *BMC Bioinformatics*, *4*(1), 20.

Therefore, any tool that can increase this factor is considered by the editors. The impact factor and other bibliometric indicators are currently utilized in most countries to evaluate institutions, scientific research, entire journals, and individual articles.

Garfield, E. (2003). The meaning of the impact factor. *Revista internacional de psicología clínica y de la salud= International journal of clinical and health psychology*, *3*(2), 363-369.

Kurmis, A.P. (2003). Understanding the limitations of the journal impact factor. *The Journal of Bone & Joint Surgery*, *85*(12), 2449-2454.

Several studies have been conducted to assess the quality of published articles in nursing journals have been considered only in terms of quantity (7).

Shoroufi studied the principles of writing medical articles, only pointed out to the number and the method of selecting which comprised the presented articles.(8) Valaei et al studied the qualitative and quantitative conditions if the articles, published in the journal at Mazandaran University of Medical Sciences. They pointed to the significance keywords and their number (9). In 2007, the Mazandaran University of Medical Sciences included the method of selecting and accessing MeSH keywords in the educational programs for the faculty members the <u>foesh</u> medical registered students and the experts who attended in the workshop. It seems that according to the outlines, syllables all of the authors are familiar with the method of selecting and their usage. Also from the beginning 2011 in "guidelines for authors" of the Journal of Mazandaran University of Medical Sciences selecting of the keyword from the title was emphasized. (10). Therefor, this study aimed at to determine, how much the keywords of the study articles correspond the MeSH.

3. MATERIALS AND METHODS

In this descriptive and cross sectional study, the articles published in the Journal of Mazandaran University of Medical Sciences 2011-2012

were selected. Twelve issues of the journal from Issue 69 to 80 were selected by sensus method. Sicne to the workshop conducted for the faculty members, the way of selecting the keywords are discussed , hence, articles of this university authors were selected as the includes criterium. Also, the corresponding author of the published articles acts for the co-authors and the journals' editor communicates with the corresponding author regarding the correction of the articles; therefore, some studies were done as the basis of the corresponding author's speciality. The variables under study were as follows: the number of keywords, the year of publishing, the number of articles published in each given issue, number of authors, the expert of corresponding author, the title of the article based on speciality of the corresponding author, the type of article from the viewpoint of reporting style, the number of published articles by the authors of the university in each issue.

Number of the published journal yearly, and the rate of corresponding till 5 keywords based on the objectives of this study, study related to the Persian and English data base was done. Finally, a checklist with the face validity was prepared and the study on the rate of corresponding was done by one of the researchers of this article who was expert in Medical informatics. He collected the data from the articles in the checklist, then the other researcher determined the rate of corresponding of each keyword using the MeSH. The data were analyzed by descriptive statistics table or curve using SPSS software.

The rate of corresponding in this study was determined as follows: if the keyword come as main heading in the MeSH (dark and selected entry) is the complete corresponding. Also, if the keyword was not as a main heading, but under main title by referring of see and see related designated as partial correspondence, and finally if the keyword not coming under main heading or never being in the MeSH(in print format of MeSH online browser) and had no general to special or special to general references designated as non-corresponding. Due to observing the

Subject of article	Frequency/Percent	Subject of article	Frequency/Percent
Orthopdeics	1(1.4)	Medical records	3(4.2)
Internal Infants	8(11.2)	Phisiology	1(1.4)
Rheumatology	1(1.4)	Vetrinary	1(1.4)
Radiology	2(2.8)	Nephrology	2(2.8)
Heart Surgery	2(2.8)	Bio Satatistics	1(1.4)
General Surgery	1(1.4)	Endocrinologist	1(1.4)
Parasite, Fungi	8(11.2)	Nursing and Midwifery	2(2.8)
Infectious disease	5(6.9)	Pathology	2(2.8)
Medical Librarianship	1(1.4)	Genetics	1(1.4)
Infants	3(4.2)	Nutrition	1(1.4)
Pharmacy	6(8.3)	Internal Heart	3(4.2)
Croner Surgery	2(2.8)	Anesthesia	4(4.1)
Skin, Dermatology	1(1.4)	Gastroentrology	1(1.4)
Islamic Knowledge	1(1.4)	Psychiatry	5(6.9)
Occupational Helath	2(2.8)	Total	72(100)

Table 1. kind of article based on Expert of Corresponding Author in study of compability ratio Latin keywords with Medical Subject Headings (MeSH) discrptors in journal of Mazandaran University of Medical Sciences

4. RESULTS

During two years, 148 articles in 12 issues were published, of them only 73 articles met their criteria of includes were selected for the study. One article was excluded from the study, because the keywords had no relation with the title of the article. Therefor, 72 articles with 260 keywords analyzed. The total number of the authors was 290 and mean number of the authors per article was 4 ±1. The range of the number of the authors varied from 1 to 7 people. The highest number of authors per article was 4 in 22 (30.6%) articles. The type articles were as follows: 3 (4.2%) review article, 54 (75%) original, 1 (1.4%) cae report, 6 (8.3%) report, 8(80%) brief report. It was found that most of the articles medical college: clinical 45 (62.4%) articles and basic science 10 (13.8%), pharmacy 6 (8.4%), nursing 5(6.9%), health faculty 4 (5.5%), Para medical 3 (4.2%) and 1 (1.3%) non medical articles from the medical college. The type of article from the viewpoint of the author's speciality is given in the table -1. The rates of corresponding of the keywords are given in table 2. The table -2 shows that in average 30% of the articles regarding their keyword is evaluated. Also 1 (1.4%) had complete corresponding keywords, and 8 (11.4) never had corresponded keywords.

In a general calculation and arrangements of the articles based on the table 3. It was showed that the highest rate of correspondence be-

longed to the clinical articles 39 (45.5%). Some terms such as practical corresponding and lack of corresponding are given in the table 4. Figure 1 shows the distribution the authors and percentage of keywords correspondence. In other words, if the number of the authors becomes more has no effect on the rate of correspondence.

ethical issue, the name of the author articles in the study were omitted and the results reported in general.

Compability ratio	First Keyword (%)	Second Keyword (%)	Third Keyword (%)	Fourth keyword (%)	Fifth Keyword (%)	Total (%)
Total compability	17(22)	34(30)	25(31)	12(15)	2 (2)	80 (30)
Relative compability	18(26)	11(22)	10(20)	10(20)	2 (1)	50 (20)
No compability	37(29)	37(29)	34(26)	15(11)	7(5)	130(50)
total	72(28)	72(28)	69(27)	14(37)	10 (3)	260(100)

Table 2: Compability situation of cited keywords and compability ratio of keywords extracted from Medical Subject Headings in published articles in Journal of Mazandaran University of Medical Sciences

Faculty	Frequency of articles/ compability Percent with MeSH
Medical Basic Sciences	10(38.4)
Medical Clinical Sciences Surgical	6(43)
Internal Medical Clinical Sciences	39(45.5)
Nursing and Midwifery	2(40)
Health	4(29.1)
Pharmacy	6(20.76)
Para Medical Sciences	5(31.8)
Total	72

Table 3: Compability of Kewrds Based on Faculties of papers presenters

Item/s used in ratio compability	Item/s used in No compability	Recommended Item/s By MeSH
-	Predictive Value	Predictive Value Test
-	99 T CM ss	99 T CM
Islamic Ethic	-	Islam
Children	-	Child
MRI	-	Magnetic Resonance Imaging
Urinary Stone	-	Urinary calculi
Heat stress	-	Heat stress disorder
B-Carbolines	-	Beta Carbolines
HBsAg	-	Hepatitis B
-	Intensive Care Unit	-
-	Invasive Aspergilosis	-
-	Erythema Marginatum	-
-	HBV-DNA	-
-	Trophin	-
-	NICU	-

Table 4: some item/s of relative compability and no compability of keywords and compability ratio of papers keywords with medical subject headings in Journal of Mazandaran University of Medical Sciences

5. DISCUSSION

Overall, the distribution of number of authors and keyword compatibly showed that there is no relationship between the numbers of authors and compatibly rate, in other words, if the numbers of authors become more, it has no effect of compatibly rate.

Use of keywords for inserting in articles for retrieving of them from electronic media, has mad revolution in accessing to cataloged materials in databases. One of these issues is that a lot of applicants are articles. If the paper type is selected with the appropriate keywords, article has continuances in Internet without constantly the author's presence or looking for their article (3).

But how to choose keywords, priority setting, and quoted in the article and the number of selected words can provides further support to the media.

However, if you want a permanent presence in the literature information resources and media such as internet browsers, we should be select and use appropriate and selected keywords with type of keywords (4).

Otherwise, we must remember that even the best papers in terms of style, paper and even methodology would be less likely to be cited. Results showed that 80 words are chosen properly which it is true for first keyword(in 17 keyword), in other words, only we can find 17 articles only by correct and appropriate key-
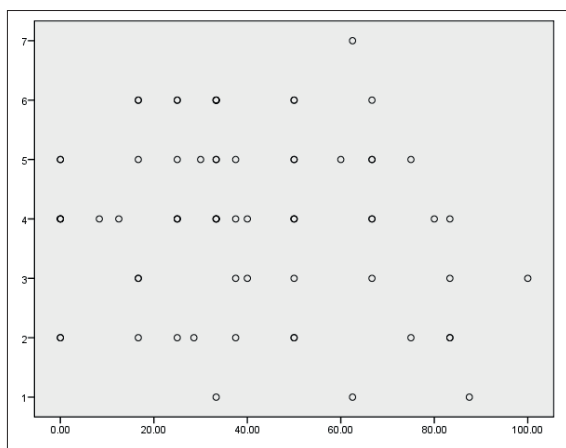
Figure 1: Scaterring number of authrs and compability of keywords and compability of articles' keywords with Medical Subject Headings' (MeSH) descriptors in Journal of Mazandaran University of Medical Sciences 2010-2011

words based on MeSH descriptors.

In this case, the expected 100% of the titles published by this University in lieu of fees for research projects, taking pause. The lack of contract between the authors and the number of words is perhaps significant in all parts of the paper that the authors do not comment, and often the general paper is written from the perspective of a person. Yet that is mentioned in the article Afshar et al. regarding the participation of some authors, there is evidence indicating a relationship between group collaboration and better quality of papers, that is It means that more collaboration is to increase the quality of articles (11).

In evaluation of the available resources in quantitative and qualitative, most writers or critique of methodology or style of writing and the Does and Don'ts in the general structure of a paper are required. Also published article in Journal of the University discussed the research design, and in review of the keywords indicated in the correct key words which used in journals, can lead to easy access for readers (7, 9). It is necessary to assess the quantity and quality of articles is known to everyone.

Of course, another reason not related to the keywords used in the University is still the way it is teaching in research workshops. It is mentioned in correspondence article which published in Indian Journal of Pharmacology 2002. Electronic databases of medical literature nowadays come with very versatile search facilities. In many of them when a 'search word' is entered, title and abstract are also

searched apart from keywords. In that case, keywords which are already appearing in title and abstract become redundant and may not serve any purpose. The truth is that the keyword concept is losing its importance because of the sophisticated electronic search facilities. Some databases can even search full text articles when they are available[5].

One of the reasons of inappropriate keywords in Journal of Mazandaran Univeristy of Medical Sciences may be because of low level of knowledge and skill of using MeSH in print format and web based format. In evaluation of research workshop of this university showed that some of the teachers are not expert in this field and they specified less time (i.e. 5 minutes) for introducing MeSH and practical exercises in using keywords for articles. It seems that, the situation and role of keywords are not defined very well for teachers. Of course, it will be solved by two methods. One of the scientific solutions of this complexity is using related and professional teachers in this field such as medical librarianship, Library Sciences, information sciences and so on. The second method and second solution is employing of a professional in the filed of above mentioned majors in Journal office, because he or she is expert in this field. Proverb, give a man a fish and you feed him for a day. Teach a man to fish and you feed him for a lifetime. It means that: It is more worthwhile to teach someone to do something, than to do something for them; or, "Give someone a fish and they eat for one meal. Teach someone to fish and they eat for an entire lifetime."

Warren references the popular saying: if you give someone a fish, you feed them for a day. If you teach someone how to fish, you feed that person's family for a lifetime. "I want to teach someone to sell fish."

Because of importance of key words, if is necessary we held special workshops for know how or how to use keywords in articles. Because one

of the criteria for including the medical journal in Medline or Pubmed, it is necessitates using appropriate and standard keywords. As it mentioned in this article, for getting more citations, standard and appropriate key words are essential. The second reason is about multi purposes of this journal, it covers different subjects of psychology, medical, nursing and midwifery, pharmacology, and so on.

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