In the name of God

What are the Medical Coding Software Requirements?

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Abstract:

Objective: To identify medical coding software requirements.

Design: To identify medical coding software requirements, 15 medical coding software products used in Iran and 6 medical coding software products used in other countries, were surveyed. Based on a literature review, a checklist containing general and specific features of medical coding software was developed.

Measurement: The criteria used for this comparison are as follows: operating system type; connected to other departments or stand alone; and general and specific requirements of medical coding software.

Results: DOS and Windows operating systems were used in 4_(29%) and 11_(71%) software products, respectively. Just 3 software products were networked products, the others being stand alone. Flexibility and improvement were 42.8% and 41%, respectively. Numerical and alphabetic lists of diseases and surgeries enjoyed the highest and the lowest frequency with 93.3% and 6.6%, respectively. In general, there are lots of weaknesses in medical coding software products in Iran.

Conclusion: Some specific features should be included in medical coding software, such as: flexibility; user-friendliness; back up ability; satisfaction of health care needs; software support, data recovery: data sharing; parallel searching; data security, integrity, validity, and accessibility; databank coding; death information recording; and researcher identification.

Introduction:

From the early 1960s through the 1970s a new era of computing emerged in health care systems.[1] Health care information management systems are currently used in many health care institutions.[2] Information sciences, information technology, and technology have been emphasized as strategic tools for enhancing health care delivery and improving performance, which will ultimately lead to optimized and efficient services.[3]

Health care quality depends on information quality.[4] Quality management, and exchange of health statistics at the national and international level is possible through efficient management of qualitative medical records.(5) The health information professionals assign diagnostic and procedural codes [6] by information in medical records.

Diagnostic and procedural codes involves the translation of medical words into codes or numbers.[7] Standard coding systems include: International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM), Current Procedural Terminology (CPT), and Healthcare Common Procedure Coding System (HCPCS). These coding systems usually include codes, code descriptions, rules, conventions, and guidelines for their proper use.[8]

Data validity, reliability, completeness, timeliness, relevance, accessibility, and security in medical coding are important.[9-11] These can be achieved through computerizing medical coding.[12,13] Medical coding software is used to automatically generate a set of medical codes for review or validation and use, based on the clinical documentation.[7]

The health information professionals must be able to prepare statistical reports based on the diseases and surgeries names, external causes of injuries and accidents, the relationship between disease, and the cost of diseases or surgery, which are then submitted to department managers in hospitals to help them make better decisions in critical situations.[9] Most medical coding software products in Iran don't have these essential requirements.[14,15] Other features such as coding training, data entry, error prevention, recording of mortality and morbidity causes, and satisfying managerial needs are important.

Patients' demographic information should be registered only one time in the admissions department, then used by the curative and accounting departments. Data sharing in different units would prevent duplication and identify system errors. However, there is no possibility of sharing information in medical coding software products in Iran.[15]

One of the requirements is the installation directions.[16] Medical coding software should also include an archive of Frequently Asked Questions (FAQs) and offer capability of asking and answering questions through e-mail to avoid repetitive questions, save time, and make it easy for users to get in touch with software managers in case of any problems.

Data security, reliability, and accessibility are important in medical coding software.[17] Data confidentiality, accessibility, integrity, and authentication are the four criteria which must be taken into

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consideration for data security. Only authorized people should have access to coded data, which should only be deleted or modified by the coders and not by any unauthorized persons. Softwares must constantly ensure data security and accessibility.

Medical coding databanks in coding software packages should contain ICD-10, ICD-9_CM, and special databanks such as DRG, HCPCS, CPT, and SNOMED, which should be updated continuously.[18,19]

Reports on the number of patients referred to different hospital departments based on their problems at a given time are important for managerial and health planning. For example, the software should be capable of reporting cases of organophosphate poisoning with suicide intention of those aged 18-30 years.

Medical coding software products should also support learning of the software. This means accompanying the user through different states of his learning process, while keeping the learning effort as low as possible.[20] Due to the variety of data entries, the coders should have coding knowledge.[21] This requires continuous training on coding rules and conventions[19] including: choosing the principal diagnosis; instructions on coding neoplasm, poisoning by drugs and chemicals, external causes of morbidity and mortality; methods of coding burns; and coding procedures.

The medical coding software system should also be able present "include" and "exclude" notes. Furthermore, up-to-date programs which linked to the World Wide Web as well as continuous training would provide coders with sufficient information

to code medical records and exchange data with their colleagues.

In this research to present the general requirements of medical coding software, the following criteria are considered: the operating system type (DOS or Windows); a connected or stand alone computer (communication between departments); general requirements such as flexibility, user-friendliness, improvement, support, data recovery, parallel searching, data security, and data sharing. The specific requirements are satisfying managers' needs, training coders, registering and reporting, prevention of entering error and contradictory data, code numbers of diagnosis and procedure, and requirements for registering researcher's information such as researchers' identification, research title and time, disease and procedure codes studied by researchers.

Methods:

This cross-sectional, descriptive study was conducted in 2008. Based on a literature review and the features of medical coding software products used in other countries, a checklist of medical coding software requirements was determined. The following six medical coding software products of other countries were selected based on easy access to their demos by means of the internet: Flash Code (Medical Coding and Compliance Solutions, LLC; http://www.flashcode.com/), Speed Coder [that is is a registered trademark of the American Medical Association, http://www.speedecoder.com], 3M (3M; http://www.3m.com/), Code Link [http://www.wisent.com/codelink_demo.

htm], Alpha II (Developer: Unicor Med; http://www.alphaii.com/), and Code Expert. Fifteen medical coding software products in Iran, without any sampling, were studied to survey the features of medical coding software used in teaching hospitals in Iran.

The medical coding software products surveyed in Iran are include: Hospital Management System (ISIRAN Company), Comprehensive Hospital System (Data System); Comprehensive Hospital Information System (Tamin Rayane); Hospital System (Behsazan Rayan Farda); Sina (Sina [Sina]); Iran Mode (Comprehensive Hospital Software System); Pooya Samane Shafa (Pooya); Hospital Information System (Tebvarayane, www.tebvarayaneh.com): Hospital Information System (Ghotbe Fanavari Shams); Comprehensive Hospital Information System (Rayavaran); Hospital Information System (Payvand Dadeha); Admission and Discharge System (ADS-9; MOHME[1]); Iranian Hospital Information System or (IHIS; Arish); IMRS (IMRS company); Death Registration System [MOHME].

Some Iranian hospital information systems and medical coding software products were excluded from our study because they did not have the range of capabilities of medical coding software, such as coding diseases and surgeries, and reporting. For example, Tendon software is only used for training coders; the software for registering road accidents is just used for registering accidents and its codes do not correspond to the International Classification of Disease (ICD).

A checklist on medical coding software requirements was prepared based on specific and general requirements of the medical coding software products surveyed. Some questions were based on the 5-point Likert scale and some were yes/no questions whose validity and reliability were determined through content validity and test-retest methods, respectively.

In comparative tables, 9 medical coding software products [Hospital Management System (ISIRAN Company), Comprehensive Hospital System (Data System), Comprehensive Hospital Information System (Tamin Rayane), Hospital System (Behsazan Rayan Farda), Sina (Sina), Iran Mode (Comprehensive Hospital Software System), Pooya Samane Shafa (Pooya), Hospital Information System (Teborayane), Hospital Information System (Ghotbe Fanavari Shams)] having exactly the same capabilities were classified in category 1. Two software products (Payvand Dadeha and Rayavaran) had the same capabilities in coding and were classified into category 2. Other software products such as ADS-9, IHIS, IMRS, and Death Registration System are allocated to separate columns.

To present medical coding software requirements, the capabilities of medical coding software used in Iran and other countries were compared. Death Registration System was not included in all tables because it is used just for registering death cases—therefore, in some tables only 14 software products are included. The data were collected through e-mail and participative observation, and analyzed by Excel software.

Findings

Tables 1-7 present features of medical coding softwares in Iran and other countries whose demos were accessible through the internet. According to the findings, DOS and Windows operating systems were used in 4 (29%) and 11 (71 %) medical coding software products, respectively. Three medical coding software products were networking products connected to other departments while the other 12 were stand alone.

The findings are presented into two classification A and B. General requirements of medical coding software (A) presented in Tables 1, 2, and 3. Specific requirements of medical coding software (B) presented in Tables 4, 5, 6, and 7.

A: General requirements of medical coding software

To identify flexibility in medical coding software the following criterion was taken into consideration: connection to the departments of the reception, discharge, accounting and others. According to Table 1, all software products, except for the Death Registration System were connected to the reception and discharge departments. Four (28.5%) medical software products were connected to the accounting department, only one (7.1%) was linked to curative departments and four (28.5%) were user-friendly.

To determine software improvement capability, four criteria were considered: back up, solving software problems, satisfying health care needs, and promoting the databank. The findings show that all software products (100%) included back up. The capability of solving software problems, satisfying health care needs,

and promoting the databank were seen in 4, 3, and 2 software products, respectively.

To determine the supporting capability of the software products the following criteria were taken into consideration: a help icon for coders; installation directions; a guiding system for managers; back up by coders without a system manager's help; program installation with no need for other programs; an FAQs archive; and the capability of asking questions to a software manager by e-mail. According to Table 2, the first five features were seen in 5 (33.3%), 1 (6.6%), 1 (6.6%), 15 (100%), and 2 (13.3%) software products, respectively. However, no software included an FAQs archive or the capability of answering questions by e-mail.

According to Table 3, four (26.6%) software products include the following capabilities: data recovery, parallel searching, and data sharing. To survey data security in the software, four criteria were considered including: confidentiality, integrity, authentication, and accessibility, which were seen in 33.3%, 26.6%, 20%, and 33.3% of the software products, respectively.

B: Specific requirements of medical coding software

To identify satisfication of managerial needs, four criteria were considered: the number of a physician's patients who recover or die, and the cost of different diseases and procedures. According to Table 4, the capability of identifying recovered patients or those who died existed in 5 (35.7%) and 3 (21.4%) software products, respectively. Four

(28.5%) products were capable of determining the cost of different diseases and procedures. To identify the capability of training coders, three criteria were taken into consideration: training courses for coders (4 products); the existence of include and exclude notes (1 product); and up-to-date training programs and connection to the World Wide Web (not seen in any products).

According to Table 5, the capability of registering causes of death exists only in two (13.3%) software products. Six (40%) products have the capability of registering date and time of death, and number of deaths in less and more than 24 hours. The capability of registering of the number of newborns who die in less than one month, the number of deaths due to hospital infections, poisoning or accident and injury, and also the age and sex of those who die in hospital existed in 2 (13.3%), 5 (33.3%), 4 (26.6%), 5 (44.4%), and 6 (40%) products, respectively.

To determine the capability of preventing error and contradiction in data entry in the software, five criteria were taken into consideration: non-coordinate surgery with disease; non-coordinate code with age; non-coordinate code with sex; entering external causes as the principal diagnosis; and registering three-character codes instead of four-character ones. According to Table 6, these criteria were available in 1 (6.6%), 2 (13.3%), 2 (13.3%), 2 (13.3%), and 2 (13.3%) software products, respectively. According to the Uniform Hospital Discharge Data Set (UHDDS), standard numbers of diagnosis and procedure codes are a maximum of eight digits for diagnosis and five digits for procedure. This capability was available in just 2 (13.3%) software products, although it should be available as standard.

To identify specific requirements of medical coding software in registering researchers information, the following items were taken into consideration: the identification of researchers; the research title and the date; the disease and procedure codes studied by the researchers; researchers' reference; registration of the abstract of the research findings; the number of medical records studied by the researcher(s) and their codes; and the number of studies and field of study. According to Table 7, these criteria existed only in one product.

In diagram 1 compares the general features of medical coding software. Flexibility and improvement are the two highest features in most medical coding software in Iran. Other requirements such as: data sharing, data security, parallel searching, data recovery, and support were nearly at the same level.

Diagram 2 shows the specific features in medical coding software. The numeric list of diseases and surgeries was the highest (93.3%), and the alphabetic list of diseases and surgeries (6.6%) was the lowest feature.

Discussion and Conclusion:
With the advent of comprehensive hospital information management systems, it is not beneficial to use a single user system in hospitals. DOS and Windows operating systems were used in 4 (29%) and 11 (71%) medical coding software products, respectively.

A user-friendly graphical interface should be used for medical coding software. User friendliness refers to the manual structure, information completeness and accuracy, clarity (style, examples), and availability of training disks and tutorial programs[16] which leads to time saving when entering data and reporting, and adapting software to departments needs. Software products used in health care facilities must be user-friendly and appropriate to the center; otherwise it will lead to user dissatisfaction and inefficient use of the software.[17] However, none of the medical coding software products used in Iran has adopted these capabilities.

It is also important that medical coding software be connected to other departments in hospitals and other health care settings. Furthermore, they should be linked to the internet because using separate software products in different health care departments in the same hospital leads to errors in data entry and lack of integrity in their correction. Moreover, data sharing among different department would prevent duplication and aid detection of systemic errors.

The Foundation of Research and Education mentions the following reasons for using medical coding software: measuring the quality, safety, and efficacy of care; managing care and disease processes; tracking public health risks; conducting research, epidemiological studies, and clinical trials; designing health care delivery systems; monitoring resource utilization; and setting health policy.[8] However, none of these capabilities is included in medical coding software in Iran. No company in Iran has invested in medical coding databanks such as ICD-9-CM and ICD-10, or special databanks such as DRG, HCPCS, CPT, and SNOMED, nor continuous updating; nor other information resources such as medical texts, anatomy, current medical terms, or medical abbreviations. While all coding software must have the capacity of incorporating these regular updates.[18]

One of the capabilities of medical coding software is support [20] in forms such as: a telephone hotline, consultation, training, active support (for installation, updating, and modification), newsletters [16] and email or web pages.[17] Tirajhe Rayane Tehran Company (http://www.trtco.com) a provider of Shafa Comprehensive Hospital Administration System, puts emphasis on its support capability and the quality of the software. This capability is included in fewer than one third (5 software products) of medical coding software products used in Iran.

Parallel searching refers to the capability of simultaneously searching on different data from different departments which is important in software evaluation.[17] This capability was available in fewer than one third (26.6%) of software products.

Medical coding software should be combined with EHR or electronic documents to speed up the coding process and reduce variability of coding assignment.[8] Electronic reporting systems and system evaluation enable recording and reporting of medical errors and adverse events, an essential step for reducing system errors and improving patient safety.[22] While only 20% of medical coding soft-

ware provides reporting on disease and surgery in a specific period of time.

The software must also include a proper backup system (training software, installing programs, and so on) and the reporting system should be set up as experts, coders and systems of statistic departments in hospitals enable easily extract information.

The Clinical Modification of ICD (ICD-9-CM) used in the United States adds codes for more accurate monitoring of diseases and for the "cause of death" data supported by the international ICD version.[18] Medical coding software should be capable of registering and reporting number of deaths less and more than 24 hours to identify the number of deaths in emergency units. Furthermore, by reporting death cases based on age and sex one can identify risk factor distribution among different age groups and sex.

Allocating specific record identification numbers to the deaths makes it possible to retrieve information based on record identification number. Calculation of infection and mortality rate in newborns is facilitated by determining the number of newborns who die in hospital.

Death registration software should register the date and time of death as well as the duration of patients' hospitalization. Death registration software products suggested by the Iran MOHME has lots of problems such as: using floppy disks which may be infected by viruses; being stand alone; and the possibility of duplicating demographic information of patients who die in hospital. Furthermore, there is no specific record identification number for death cases in current death registration software, so it is impossible to retrieve related information.

Registering deaths by differentiating those happening less or more than 24 hours in hospital would identify the number of deaths in emergency units. Also the years of life lost could be calculated by registering the age and sex of those who died. None of these features is included in medical coding software used in Iran.

The death registration system should be capable of registering deaths due to infection to enable surveying of the distribution of various risk factors leading to death. It should also be capable of reporting cause(s) of deaths, including various kinds of accidents. The medical coding software should be capable of registering external causes to report other causes of death, including: falls; exposure to inanimate and animate mechanical forces; accidental drowning and submersion; other accidental threats to breathing; exposure to smoke, fire and flames, contact with heat and hot substances, venomous animals, and poisonous plants.

Availability of necessary information to medical coding software managers helps them to do performance evaluation based on the number of patients and hospital revenue and to report the number of patients referred to other facilities.

Reporting disease and surgery based on the body organs, diseases, patient's job, job-related diseases, concurrent diseases, cancelled surgeries, and type of insurance are necessary for planning. The reports should be based on records or hospital identification number instead of patients' names in consideration of pa-

tient confidentiality. Preparing various reports makes it possible to determine costs allocated to each disease and operation, and to show bed occupancy based on disease and operations categories.

Reports on the number of patients referred to each hospital department during a specific period of time is another essential feature for software to capture and can be used for strategic planning in the country. Furthermore, it is necessary to show repeat operations by adding a specific characters or sign for reoperation.

Other important requirements for medical coding software are: coding training programs that include training rules and conventions on selecting principal code(s), neoplasm coding guidelines, coding burns, coding poisoning by drugs, medicaments and biological substances, external causes of morbidity and mortality, coding procedures. Moreover, software products should have include and exclude notes, up-to-date medical coding databanks, the ability to connect to the World Wide Web, and provide online training in medical coding.

HIM professionals, hospital managers, computer engineers, and health economic and medical records experts should regularly attend meetings held on designing and implementing medical coding software so that medical coding software is kept up-to-date in terms of both medical coding requirements as well as the latest technology.

Appendices

Table 1: General requirements of medical coding software about flexibility, user-friendliness, and improvement

Requirements		Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Numbers	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert	
Flexibility	Connection to reception and discharge departments	*	*	*	*	*	-	13	14	92.8	*	*	*	*	*	*	*
	Connection to accounting department	-	*	-	*	*	-	4	14	28.5	*	*	*	*	*	*	*
	Link to other departments	-	-	-	*	-	-	1	14	7.1	*	*	*	*	*	*	*
User-friendliness		*	*	*	*	*	*	4	14	28.5		*	*	*	*	*	
Improvement	Back up	*	*	*	*	*	*	14	14	100	*	*	*	*	*	*	*
	Solving software problems	-	*	*	*	*	-	4	14	28.5	*	*	*	*	*	*	*
	Satisfying the needs of health care settings	-	*	-	*	*	-	3	14	21.4	*	*	*	*	*	*	*
	Promoting the databank	*	*	-	*	*	-	2	14	14.2	*	*	*	*	*	*	*

Table 2: General requirements of medical coding software about support

Requirements	Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Numbers	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert	
Support	Help icon for coders	-	*	-	*	*	*	5	15	33.3	*	*	*	*	*	-
	Installation directions	-	-	-	-	-	*	1	15	6.6	-	*	*	*	*	*
	Guidance of system managers	-	-	-	-	-	*	1	15	6.6	-	*	*	*	*	*
	Back up by coders without the help of system manager	*	*	*	*	*	*	15	15	100	*	*	*	*	*	*
	Program installation with no need for other pro-grams	-	-	-	*	*	-	2	15	13.3	*	*	-	*	-	-
	Frequently asked questions archive	-	-	-	-	-	-	0	15	0	-	*	*	*	*	*
	Capability of answering ques-tions by e-mail	-	-	-	-	-	-	0		0	*	*	*	*	*	*

Table 3: General requirements of medical coding software about data recovery, parallel searching, security, and data sharing

Requirements		Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Numbers	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert	
Data recovery	-	-	*	-	*	*	-	4	1 5	26.6	*	*	*	*	*	*	
Parallel searching	-	-	*	-	*	*	-	4	1 5	26.6	*	*	*	*	*	*	
Data security	Confidentiality	*	*	-	*	*	-	5	15	33.3	*	*	*	*	*	*	*
	Integrity	-	*	-	*	*	-	4	15	26.6	*	*	*	*	*	*	*
	Authenticity	-	-	-	*	*	-	4	15	20	*	*	*	*	*	*	*
	Accessibility	-	*	-	*	*	*	5	15	33.3	*	*	*	*	*	*	*
Data sharing	-	-	*	-	*	*	-	4	1 5	26.6	*	*	*	*	*	*	

Table 4: Specific requirements of medical coding software about satisfying managerial needs and training coders

Requirements	Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Numbers	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert
Satisfying managerial needs	Identify the number of recovered patients of a specific physician	-	*	*	*	*	-	5	14	35.7	*	*	*	*	*	*
	Identify the number of a specific physician's patients who die in hospital	-	-	*	*	*	-	3	14	21.4	*	*	*	*	*	*
	Determine the cost of different diseases	-	*	-	*	*	-	4	14	26.6	*	*	*	*	*	*
	Determine the cost of different procedures	-	*	-	*	*	-	4	14	26.6	*	*	*	*	*	*
Training coders	Training courses for coding	-	-	*	*	*	*	4	15	26.6	*	*	*	*	*	*
	Existence of include and exclude notes	-	-	-	-	*	-	1	15	6.6	*	*	*	*	*	*
	Up-to-date training programs and connection to the World Wide Web	-	-	-	-	-	-	0	15	0	*	*	*	*	*	*

Table 5: Specific requirements of medical coding software about death

Requirements		Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Numbers	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert
Regis-tering and Report port-ing	Causes of death	-	-	-	-	*	*	2	15	13.3	-	*	*	–	*	*
	Date and time of death	-	*	*	*	*	*	6	15	40	*	*	*	*	*	*
	Number of deaths in less than 24 hours	-	*	*	*	*	*	6	15	40	*	*	*	*	*	*
	Number of deaths in more than 24 hours	-	*	*	*	*	*	6	15	40	*	*	*	*	*	*
	Number of deaths of new-borns (from birth to 28 days of life)	-	-	-	-	*	*	2	15	13.3	*	*	*	*	*	*
	Death due to hospital infec-tions	-	*	-	*	*	*	5	15	33.3	*	*	*	*	*	*
	Death due to poison-ing	-	-	-	*	*	*	4	15	26.6	*	*	*	*	*	*
	Death based on gender and sex	*	*	*	*	*	*	6	15	40	*	*	*	*	*	*
	Death due to accident and in-jury	-	*	-	*	*	*	5	15	44.4	*	*	*	*	*	*

Table 6: Specific requirements of medical coding software about preventing entering error and contradictory data, and code number of disease and procedure

Requirements	Category 1	Category 2	ADS9	IHIS	IMRS	Death Register	Frequency	Total Number	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert	
Prevention of entering error and contra tradict dictory data	Inconsistency between procedures with disease	-	-	-	-	*	-	1	15	6.6	*	*	*	*	*	*
	Inconsistency between age and diagnosis or procedure code	-	-	-	-	*	*	2	15	13.3	*	*	*	*	*	*
	Inconsistency between sex and diagnosis or procedure code	-	-	-	-	*	*	2	15	13.3	*	*	*	*	*	*
	Registering external causes as principal diagnosis	-	-	-	-	*	*	2	15	13.3	*	*	*	*	*	*
	Registering 3-character codes instead of 4-charac-	-	-	-	*	*	-	2	15	13.3	*	*	*	*	*	*

	ter ones																
Code numbers of diagnosis and procecedure	Limitation of the number of diagnosis codes based on UHDDS	-	-	-	*	*	-	2	15	13.3	*	*	*	*	*	*
	Limitation of the number of procedure codes based on UHDDS	-	-	-	*	*	-	2	15	13.3	*	*	*	*	*	*

Table 7: Specific requirements of medical coding software about registering researcher's information

Requirements	Category 1	Category 2	ADS9	IHIS	IMRS	Frequency	Total Number	%	Flash Code	Speed Coder	3M	Code Link	Alpha II	Code Expert
Research-ers' identifi-cation	-	-	-	-	*	1	14	7.1	There is no information about register-ing research-ers' informa-tion in any of these software products.					
Research title and time	-	-	-	-	*	1	14	7.1						
Disease and procedure codes stud-ied by re-searchers	-	-	-	-	*	1	14	7.1						
References (Name of organization introducing research-ers)	-	-	-	-	*	1	14	7.1						
Registera-tion the abstract of the re-search find-ings	-	-	-	-	*	1	14	7.1						
Number of medical records studied by researchers and their codes	-	-	-	-	*	1	14	7.1						
Reporting the number of studies and field of study	-	-	-	-	*	1	14	7.1						

General requirements of medical coding softwares in Iran

Legend: Data shahring, Data security, Parallel search, Data recovery, Supporting, Improvement, User-friendly, Flexibility
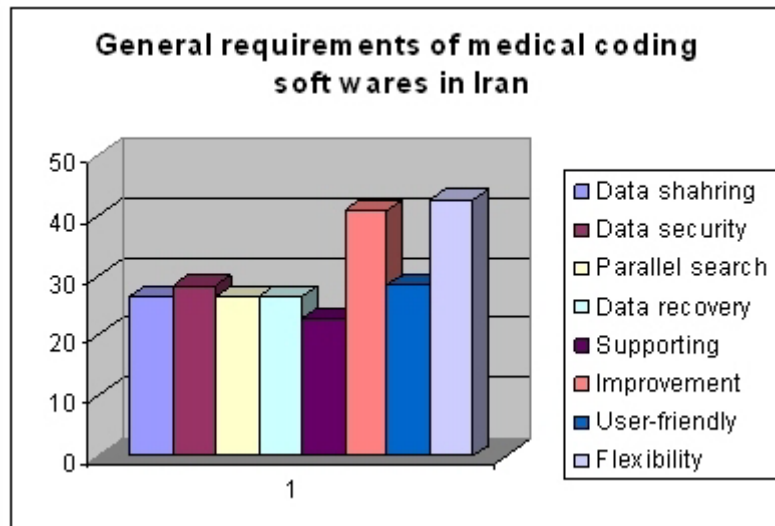
Diagram 2: Status of specific requirement of medical coding software in Iran

Special requirements of medical coding soft wares in Iran

Legend: Numeric list of disease, Alphabetic list of disease, Numeric list of procedure, Alphabetic list of procedure, affording of managerial needs, information about dealth, error and contractory data, reporting of disease, training of coders, researchers information
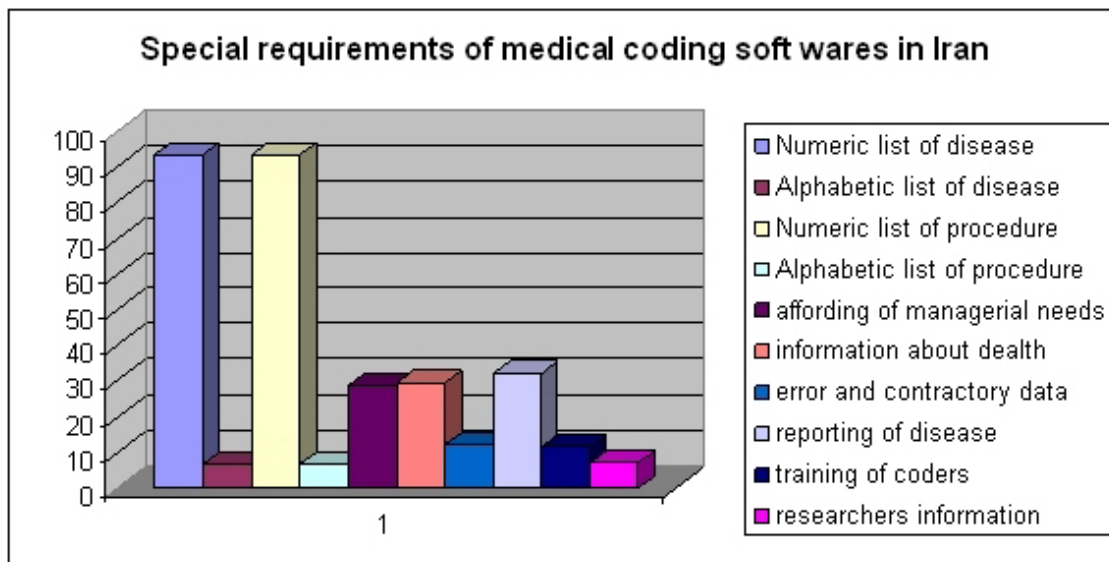
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