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Predictive Data Mining in Clinical Medicine: Current Issues and Guidelines

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Abstract

The following study is based on the predictive data mining in clinical medicine where all data have been selected by focusing on the following topic. At the first the brief introduction of data mining, predictive data mining and its usage on the clinical medicines have been shared. Then the required materials and methods have been furnished up next. After that, the usages of predictive data mining in clinical medicines have been elaborated. The usages have been depicted within several parts of, such the use of predictive data mining in the clinical medicines. Also, the uses of different models of predictive data mining have been illustrated within an extensive manner. Later on, the benefits of predictive data mining for the healthcare sector and its profit making and advantages for using predictive data mining for a medical practitioner have been represented by gathering valid insights. Furthermore, the challenges and issues related to healthcare sectors and clinical medicines have ben flaunted in the following study and the strategies to mitigate the problems by using predictive data mining has been depicted within sheer elaboration.

Keywords

clinical medicines, healthcare sector, predictive data mining.

INTRODUCTION

In the era of technology implementation and its expanding services across the world, data mining is an important factor which has been used from the beginning of technology implementation. Data mining is the method of sorting through a large scale of data sets to investigate the paradigms and bonds that can be able to solve issues related to the clinical medicine data analysis. Thus, the data mining techniques and the instruments to activate the enterprise to assume future trends and make more informed decisions which can help a business to be benefited in an extensive manner. Apart from this, there are two major types of data mining and the types are as follows-predictive data mining and descriptive data mining [1] The data mining which is known as predictive data mining, has been used majorly in various kinds of fields. In the field of clinical medicine, predictive data mining has been majorly used by maintaining all the norms of data mining. Predictive data mining has been used for the purpose of implementing business intelligence or other data to predict or assume the trends within the existing marketplace [2]. This type of data mining can help a business and the business leaders to make firm decisions and add several ethical norms to the efforts of the analytical team of clinical medicine.

The major goal of predictive data mining in clinical medicine is to derive the models that can implement the information or details which are related to a patient to assume the results of interest and to thereby support clinical decision making in an effective manner. In clinical medicine, the use of predictive data mining helps the doctors to create proven diagnoses and conclusive results which are related to the background of a patient [3]. In other words, when it still takes a well trained clinician to arrive at the final decision making, artificial intelligence software can process and expand vast arrays of data in a matter of seconds.

MATERIALS AND METHODS

In order to fulfil the needs of the data which has been gathered to evaluate this study, there are some crucial types of materials and methods that have been chosen and implemented to execute the subject matter. As the topic is based on the use of predictive data mining in clinical medicine, there are several types of data which have been collected for the study and are also associated with the subject matter directly. The study has been evaluated by focusing on the depth of the subject matter to collect raw data of predictive data mining from authentic and reliable sources.

The study has been served by providing proper research design and research design which has been chosen for this study is cross-sectional research design. Reason for choosing cross sectional research design is to compare several various variables at the same time. Furthermore, the data which have been collected for this study are secondary data by trait and the data have been collected by following qualitative research method. Also, for this study, the inductive research approach has been selected and implemented to bring betterment in the execution process of the research work. Later on in the following study, secondary data are associated with the concept of predictive data mining and serve the processes which are related to clinical medicine. Additionally, the data for this study are collected from recent sources and authentic peer reviewed journals which have been published after the year of 2019. Therefore, the study has been evaluated with proper insights and appropriate types of materials and methods which can fit into the study.

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RESULTS

Certainly, predictive data mining is becoming an extensive and crucial tool for the researchers and the clinical practitioners in the medical field and medicines. By understanding the core problem which is underlying within implementation of the process and the application of agreed and standardized processes are needed for the deployment and dissemination of the outcomes. The visibility of extension of upgraded computational procedures and instruments for analyzing the data and predictive modelling needs medical information by assessing which medical practitioners systematically cope up with the clinical predictions issues [4]. Generally predictive data mining has been used in the clinical medicine largely to make proper decisions as per the requirements of the patient and the process of diagnosis as well. Main goal of predictive data mining in clinical medicines is to justify the information and details which are apparently related with a patient. In clinical medicine, predictive data mining method has been implemented to the making of decisions models for processes. The processes are as follows- prognosis, diagnosis and planning for treatment [5]. The decision making models which have been used in clinical medicines are commonly used to give prompt reaction in adverse situations.

Predictive data mining might give to the improvement of clinically impactful predictive models which are interrelated with each other in a comprehensive manner. Also, predictive data mining has been used generally in the process of application of a number of various techniques from different disciplines with the objective to explore innovative paradigms from the collected data. An engineer uses predictive data mining which relies on its association of the decision making models and the models are crucial to the field of clinical medicine which have been regarded with the different standards in a certain manner. There are three major usages of predictive data mining in the clinical medicine and the usages are as follows- assume the similarity that particular treatment plan would be impactful for a patient [6]. Also, with the help of predictive data mining, the chronic situations can be traced within a patient and also, it allows the practitioner to identify the rigorous signs before the conditions go out of the hand. Predictive data mining also fixes whether a patient is at risk for improving certain infections or situations of a patient.

Furthermore, predictive data mining is an immensely impactful process which allows a medical or clinical practitioner to better anticipate the requirements and gives the permit to identify the crucial paradigms, trends and data. This helps providers to undertake actionable information to develop entire clinical results, construct actionable population initiatives related to health and enhance entire patient involvement and retention of patients in a certain manner [7]. Also, predictive data mining helps to support operational decision making in a successive manner. Healthcare sectors or clinical medicines can implement predictive data mining to derive the information that can help to gain organizational objectives and develop the potentiality of decision making in an effective manner. There are some generic benefits of using predictive data mining within a clinical medicinal organization. Predictive data mining helps to provide opportunities to an organization to develop the internal features properly to diagnose a patient in a successful manner. As it helps in the process of decision making, it can provide a proper type of budgeting plan for an organization.

By using predictive data mining models, a patient's lifetime value can be changed to provide a better segmentation in a certain clinical medicine. The predictive data mining helps to increase the resources to grow the market share at a fast pace within a certain type of clinical organization. A compelling implementation for predictive data mining models is continuously anticipating the requirements for the medical services for a patient. In case a team is making a plan to conduct a promotion campaign to serve the cardiac service line, before making an investment, the team leader needs to find a cardiac specific model in a certain manner [8]. When the team leader would be able to find the model, that individual needed to find an impactful cardiac health campaign which would help to enhance patients demand apart from capability of the service line in that clinical medicine organization.

Predictive data mining is an impactful step to ensure quick cure for a patient. It drives plenty of customized care, quick interventions, activates rapid operations and mitigates cost, in other words, it makes the procedure cost effective for the patients and for the organization as well [9]. There are several benefits of using predictive data mining which can be considered as the impactful model to recognise the issues of the patient and brings sheer amount of profit to the organization. By implementing predictive data mining within the clinical medicine, the valid number of audiences can be found in a certain manner to expand the business of that particular clinical medicine organization.

The valid and proper healthcare analytic instruments develop a valid type of straightforward procedure which can provide the clinical medicines a certain type of business deals with patients. Predictive data mining, simply associates the data to the required medical services to let the instruments conduct the analysis and within some moments, the organization would be able to get a sheer number of target audiences within the organization. Also, the models intend to contextualize the target audiences with behavioural clusters with different types of patients' requirements. The clusters elaborate reasons to target audiences and help to design valid information with perfect CTA to make a huge impact on patient's behaviour.

Predictive data mining is a crucial tool for a researcher who is associated with clinical medicine and a clinical medicines practitioner in a certain manner. Certainly, predictive data mining can be able to mitigate issues and challenges which are related to the clinical medicines and the challenges can be raised for a patient and for a practitioner as well. The biggest challenges which are related to clinical

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medicines are as follows- the high cost health care services. It is an obvious factor that for the upgrade technology implementation, the costs are increasing on a daily basis based on the rate of the new technology which can help the healthcare sector and services with the upgrade technology implementation in a certain manner [10]. Also, another issue can be raised within the healthcare sector in a certain manner. The slower recruitment of patients can happen than needed in a certain healthcare organization to make the services more hectic for the patients and for the practitioner within the organization.

By looking at the vigorous issues over the past few decades of clinical medicines and healthcare sectors, the industry and political leaders, the clinical practitioners have faced several types of challenges that can make a huge impact on the quality of care and can increase the rate of cost in a certain manner. For example, in the immediate time of the Covid pandemic, it has been highlighted that the issues which have been faced by the hospitals have decayed the patient's retention and care of the patients in a certain manner. Also, in the times of post Covid, the patients got extremely frightened by the strike of global pandemic and for this following reason, the patients refused to go for a check-up [11]. This particular trivia affects the entire workflow of a healthcare sector and increases the issues related to the healthcare organization.

As an illustration of the pandemic, in the aftermath of this vital global pandemic, the clinical medicine and healthcare sector's issues become more thorny and difficult to get mitigated in a certain manner. The practitioners and professionals within clinical medicines who have been drawn to the administration of healthcare face several issues in solving the issues which might be accepted as the core problem within the clinical sector from the past few decades [12]. As the prior problems of the healthcare industry, the higher cost of healthcare services becomes a greatest problem which can affect the entire patient's retention of an organization in a certain manner. Certainly, the most pressing problems in clinical medicines is the high cost of medical services which can decay the entire employee retention in a certain manner and can decrease the demand of that particular organization of clinical medicines for the patients.

There are half of the adults who stated that it is actually immensely difficult to afford the healthcare services which have the high rated Medicare plans to make the patients curable within a certain time span. Additionally, the high courts of clinical medicine changes patients' behaviours towards the medical services and affects the poverty stricken patients who would not afford the plans which are actually needed for the patients for long term cure. It is an immensely obvious factor that the patient who would not be able to afford the medical services which are highly costly to be afforded, they would not recommend the plans to others because of the rated plans and services within that particular organization [13]. These particular issues related to the healthcare sectors and services can leads an complicated challenge which can affects the mental health of the patient and can affect the stability of the healthcare services in a certain pace.

In the clinical medicines and eat care sector, the concerns of health equity can create a huge difficulty within a particular organization for a long period. The healthcare sector or the clinical medicines industry consists of long noted disparities in health care results among various populations. These following disparities are not solely bonded to the revenues, benefits and costs of care within a certain organization. The aspects know the social determinants of health within the healthcare sectors and the clinical medicines in a certain manner [15]. Social determinants can be laid with the code of ethics, race, caste, ethnicity and access to jobs in a successive manner. In addition, the healthcare plans have always been served to the higher castes patients who are actually paying for the luxurious services within a particular organization of the healthcare sector.

Also, there are other challenges which are related to the clinical medicines and healthcare services are the promise and pitfalls of technology implementation within the healthcare sector. The present clinical medicines and healthcare issues have greater challenges but in cases not regulated properly, it can lead to several issues within that particular organization or within the healthcare industry for a long period. The clinical medicines and healthcare services increasingly depend on the data which are related with the patients from all aspects of the healthcare sector. Even before the time of global pandemic, healthcare and clinical service providers have been activating around several amounts of data on patients for each year which were actually helpful to get in the best care of the particular healthcare sector [16]. These which have been used over a patients involves not only the infarct which have been compiled within an electronic health record hurt also executives data like addressee, demographic details of the patients, insurance policy regarding healthcare, claims, payments records and appointments scheduling as well.

By using the predictive data within clinical medicine and healthcare, the following issues related to the healthcare sector and clinical medicines can be mitigated in a certain manner with a proper execution plan. As predictive data mining helps to create a sheer amount of decisions which are actually related with several aspects of a healthcare sector then certainly it has a huge role related to the cost effective process for a medical plan. The predictive data mining helps to create segmentation within making decisions for the medical practitioners and healthcare leaders who are actually related with the process of decision making in the particular healthcare sector in a successive manner. By creating a sheer amount of plans to undertake proper decisions and make appropriate plans to serve the patients in a proper way, the issues related to high budgeting can be reduced at a certain pace which can make a proper amount of profit for the healthcare service providers for a long time span [17]. For

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future services, the particular can be able to rely on the services which can give the patients proper health care treatments and by getting affordable healthcare services, the patients can be able to recommend the service to other patients which actually need the services.

The predictive data mining helps to create segmentation which are related to the capacity of affording a plan of patients to get sheer amount of medical care within an organization. Also, by segmenting the plans, it becomes immensely easy for the patients to fetch the affordable plans of the clinical medicines at a certain pace. Predictive data mining does the process of segmentation by using the models which belong to the process of data mining in a certain manner. Also, by using the predictive data mining, the equity within the healthcare services can be increased to give an appropriate and proper type of healthcare services which are actually needed by every patient who is in need. Later on, another factor of implementing the predictive data mining in the clinical healthcare is to upgrade the technological implementing and creates proper types of technological balance within the organization which can help the healthcare service provider within the clinical medicines who are actually seeking for the profit making within the organization.

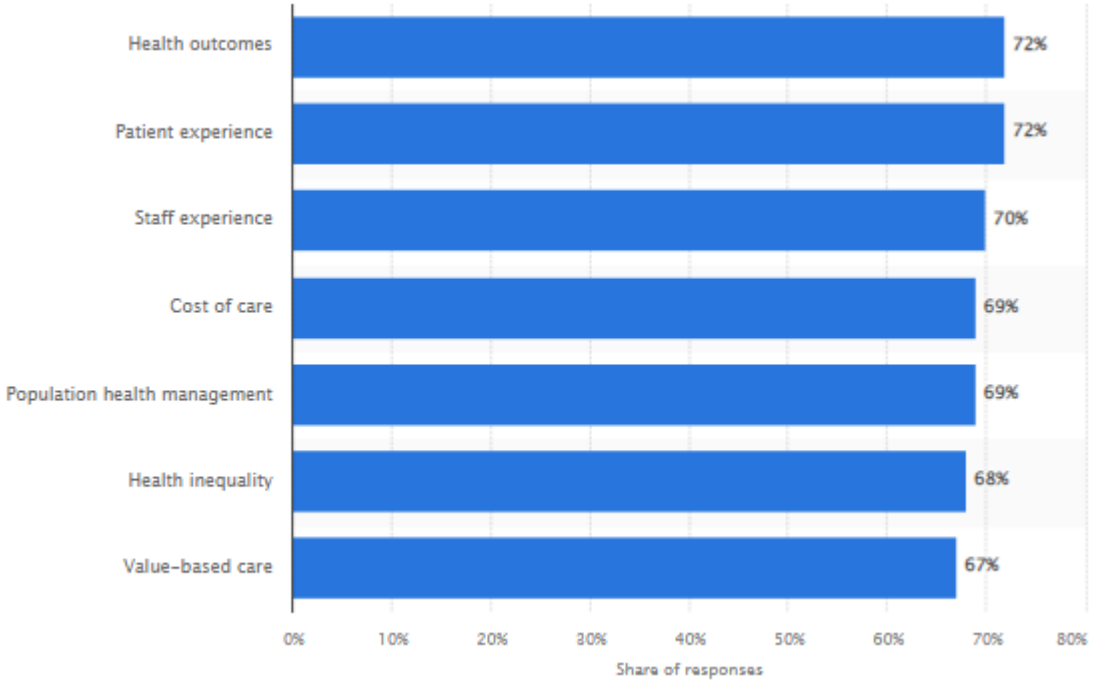

Figure 1: Usages of predictive data mining in the healthcare sector in the year of 2022

The total use of predictive data mining is increasing across the world by the year of 2022, in the healthcare sector and in the clinical medicines as well. In the month of February 2022, 72% of the healthcare leaders have shown the urge to use the predictive data mining which are actually related with the entire profit making of the healthcare service sector [18]. Additionally, 72% thought that the experiences of the patients would be developed by using predictive data mining in the healthcare organization or in the healthcare sectors to be able to increase the patient's retention in a successive manner. Therefore, depending on the traits and behavioural nature of the patients, the healthcare leaders are increasing the usage of predictive data mining at a maximum rate within the healthcare sector for a long term period.

DISCUSSION

The following study is based on the use of predictive data mining in the clinical medicines and its current usages, problems and limitations and subject matter has been served by using proper data which are related to the use of predictive data mining and its impact from all aspects. At first the concept of predictive data mining has been distinguished for the clinical medicines and in a certain article it can be seen that predictive data mining is different from the actual data mining in the healthcare industry. In the beginning of the study, the study has been served with the help of predictive data mining and its different kinds of models which actually has the huge impact over making decisions and selects the proper types of healthcare plans for the patients in a certain manner. The following predictive data mining models can be used in the process of decision making which can give the health sector and the clinical medicines a certain type of decision making process which can be used within a particular healthcare sector or a healthcare organization.

There are several kinds of usages depicted for using predictive data mining within the healthcare sector in a successive manner. Also, in the crucial process of clinical medicines such as, prognosis and diagnosis have been conducted within the help of predictive data mining with a successive manner of a healthcare industry. Furthermore, with the help of clinical data analysis, the information related to a patient can be justified for the sake of safety of other patients and the organization as well. The patient's details

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and demographic information can be verified in a certain manner which can give a quick acceleration to the process of clinical medicines for a certain time span. Also, there are several kinds of problems and challenges which have been raised within the clinical medicines and healthcare sector which can be faced by the patients and by that specific healthcare organization as well. Issues which are related to high cost healthcare plans, equal treatments of all patients and equals behavioural changes towards the healthcare organization of the clinical medicines. Lastly, the results have been shown over the usages of predictive data mining to mitigate the issues which are related with the clinical data mining.

CONCLUSION

The following study is based on the implementation of predictive data mining on the clinical medicines and the recent issues and problems related to clinical medicines which have been made from the past few decades of the existing healthcare services. In the introductory part of the following study, the brief introduction over the topic has been represented over the following topic. At the introductory part of the study, the subject matter has been explained with a sheer elaboration and all sorts of insights have been collected by depending on the depth of this subject matter. The insights have been collected from the authentic sources related to clinical medicine and predictive data mining.

Furthermore, after the execution of introduction to the subject matter, the crucial types of materials and methods have been selected and implemented for the execution of the topic. For this following research, the cross sectional research design, inductive research approach and qualitative research method have been followed to evaluate the collected data of this study. Also, the data which have been shortlisted to execute the study in a successive manner are secondary data by trait and all of the insights have been selected from peer reviewed journals and recent articles which are based on the following subject matter.

In the next part, the clear elaboration of predictive data mining and its use in clinical medicines has been represented to showcase benefits of clinical data mining within an extended manner. All types of models, usages of predictive data mining, recent issues related with the clinical medicines and plans for mitigating the issues by implementing predictive data mining have been discussed with elaboration. Lastly, the study has been colluded with sheer discussion over the subject matter.

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