Deep Learning-Based Medical Data Association Rules Method Analysis of Characteristic Factors of Nursing Safety Incidents in ENT Surgery

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Abstract

Otolaryngology is a fairly prevalent condition, and complications including infection and significant bleeding frequently happen during surgery, which pose a serious risk to the patients' mortality. Exploring the distinctive characteristics of postoperative nursing safety events in patients who have undergone otolaryngology surgery and comprehending the distinctive features of postoperative nursing safety events in otolaryngology surgery patients are of utmost importance. 52 incidences of postoperative safety nursing incidents were identified by this study's preoperative safety protection for 385 inpatients. According to this study, the main factors influencing postoperative care are confected lesions (95.0% C1: 9.365–21.038), the treatment period (95.0% CI: 7.147–20.275), during hospitalisation (95.0% CI: 8.918–24.237), antibiotic use (95.0% CI: 8.163-21.739), and hypertension (95.0% CI: 7.926-22.385). Using the association rule method to analyse and control the major risk.

Keywords: ENT Surgery; Otolaryngology surgery; Hypertension; Risk factor; Treatment; Deep Learning

Introduction

The present data mining technology has advanced significantly since the earliest discussions about knowledge discovery and data mining originally took place. Data analysis technology is the on-going development of data processing and analysis tools that can swiftly unearth important information. Data mining software and technologies are widely employed in all spheres of life and have had substantial positive economic and social effects on the medical and healthcare industries. The application in healthcare is still in its early stages, though. In comparison to other businesses, the healthcare sector needs data mining technology to handle data, and after utilising this technology, this sector can undertake supplemental exams, experience summaries, and data analysis. Medical data mining therefore has a greater practical value [1].

A greater number of medical institutions and personnel will acknowledge the advancement potential in medical research and the extensive use of data mining technologies in medicine. How to extract valuable information from the data is currently the most pressing issue in the processing of medical data due to the particularity, timeliness, complexity, instability, and incompleteness of the data. The diagnosis and treatment of illnesses, medical and health management departments' scientific decision-making processes, the spread of diseases, the prevention and treatment of infectious diseases, and physical examinations can all benefit from the findings of this research. Common clinical strategies to judiciously use medications for clinicians and lessen the physical and psychological strain of patients can be discovered through research on the application of clinical and medical pharmaceuticals [2].

It will greatly improve the hospital and the ability of medical staff to diagnose and treat, lower the rate of misdiagnosis, and lessen the physical, mental, and financial pressure on patients if the means and means of data processing can be used to uncover hidden, in-depth, and diagnostically valuable data and rules from the massive data. The amount of data required by numerous fields has significantly expanded as a result of the rising popularity of computer science and technology.

Therefore, data mining technologies must be used to study how to extract relevant information from a big amount of data. This novel approach was utilised to hold extensive conversations on clinical disease monitoring, pharmacological treatment effect assessment, and disease prevention and treatment during the drafting of association law [3].

A common definition of nursing safety is the absence of any mental, structural, or functional impairment, handicap, defect, or fatality over the entire course of medical treatment. Aside from having a significant detrimental impact on the quality of nurses' job, the complexity, breadth, and instability of the work of nurses will also have an adverse effect on the hospital's society and economy. Nursing staff members have been building up their experience in recent years as they try to increase nursing safety, prevent medical safety incidents from happening, and allow patients to obtain adequate, timely, and safe nursing care as well as preserve and recover their bodies [4].

Otolaryngology is a fairly prevalent condition, and complications including infection and significant bleeding frequently happen during surgery, which pose a serious risk to the patients' mortality. The safety of providing nursing care to surgery patients is impacted by a number of major factors. This therapy increases the patient's physical suffering as well as their financial burden. The earliest feasible nursing interventions can prevent and decrease postoperative problems. In this study, 385 otorhinolaryngology surgical patients during the months of October 2019 and December 2021 were chosen as the survey participants. The single factor analysis and logistic variance regression methods were used to calculate the statistics of risk factors. The goal is to offer a specific reference for the nursing safety of patients having ENT surgery in actual clinical settings [5].

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Materials and Methods

A total of 385 otolaryngology patients in a hospital, ages 17 to 73, were chosen between October 2019 and December 2021. (). There were 195 women and 190 men among these patients. Every patient had ENT surgery and was not included. 264 individuals also had high blood pressure. 52 individuals who had had otolaryngology surgery received postoperative treatment. In this study, risk factors including gender, age, pathogen type, infection site, length of surgery, length of hospital stay, use of antibiotics, and hypertension were gathered. To assess comorbidities and recurrence, all subjects were monitored for a full year [6].

For this investigation, Weka mining software was chosen. A java-based open-source tool for data mining and knowledge discovery, Weka is officially known as Waikato Intelligent Analysis Environment. Weka is considered to be the most well-known open source data mining software and is one of the most comprehensive data mining solutions currently accessible. It has an uniform user interface and incorporates numerous machine learning algorithms that are capable of performing data mining tasks, such as pre-processing data, association rule mining, classification, clustering, etc. It also offers rich visualisation capabilities. Weka can be used to perform routine data mining jobs, but because its source code is available, it can also be utilised to further the field of data mining [7].

Discussion

Otolaryngology is a fairly prevalent condition, and complications including infection and significant bleeding frequently happen during surgery, which pose a serious risk to the patients' mortality. The safety of providing nursing care to surgery patients is impacted by a number of major factors. This therapy increases the patient's physical suffering as well as their financial burden. Data mining (DM), commonly referred to as KDD, is a recent development in information processing technology. The goal of data mining (DM) is to extract models or implicit information from huge data sets stored in databases, data warehouses, or other databases. DM is built on database technology, which naturally combines neural networks, parallel computing, artificial intelligence, and statistics. Data mining is a process that uses a range of analytical techniques to detect patterns and connections in vast amounts of data. It then uses these findings to generate predictions and assist decision-makers in discovering potential links between data that may have been overlooked. As a result, it is now a useful strategy for addressing the current data explosion and information gap [8].

From vast data, DM can extract prospective, new, useful, understandable, and easy-to-store knowledge processes and procedures. In order to depict the trend of historical development, adapt to future development directions, get excellent query performance, and give support for decision-making news, DM transforms huge data into meaningful information while dealing with it. Data mining is the process of extracting prospective, previously unknown but hidden information from a data warehouse and transforming it into rules, patterns, and other forms. Model-based data collecting techniques include categorization model, regression model, and time series model. The clustering model, association model, and sequential model make up the model [9].

The method first describes a predetermined set of concepts or data before modelling the database unit, which is assumed to be a predetermined category and is referred to as a "class." The units are referred to as "class sets" and are "sampled" for said "training" selection.

The continuity of the regression model was simulating using multiple regression statistics. Many issues can be resolved by linear regression, and nonlinear issues can be linearized in order to be resolved. The time series model will forecast the data based on its historical time series trend. The linear regression model and this are extremely similar. The time domain features, in particular the impact on the time domain, must be considered in timing analysis. Based on this, it is necessary to properly account for the influence of time and perform a dynamic analysis of a set of values in accordance with the available information in order to accurately forecast the future values.

The cluster mode involves segmenting a population into several groups in order to keep populations within the same group as near together as feasible while reducing the number of populations between other groups. Cluster mode, which is dissected and merged in accordance with particular cluster parameters, is the combination of a group of entities or a group of abstract objects into numerous categories of comparable things. This approach can be used to acquire the category parameters after the goal has been met [10].

Conclusion

Chronic otitis media, chronic tonsillitis, chronic sinusitis, nasal polyps, deviated nasal septum, acute and chronic laryngeal obstruction, ear, nose, sinus, and throat and neck cancers are the three main categories of ENT illnesses. Some ENT conditions necessitate surgery, and nursing safety hazards including bleeding, infection, etc. are frequent and can significantly decrease patient life. A survey was conducted on 164 patients who had undergone ENT surgery, and the results revealed that 14.02% of the patients reported issues with nurse safety. In total, 59 of 385 patients in this study experienced nursing safety mishaps following surgery; the incidence rate of 15.3% was consistent with the circumstances described above.

Following-surgery nursing safety incidents not only made the patient's condition worse but also put the patient and their families under unnecessary financial strain. In order to treat and predict the course of the disease, it is crucial to analyse the safety risk of postoperative nursing of stroke patients. The impact of nursing safety following otolaryngology surgery was examined using multivariate logistic regression, and a preliminary discussion of the public analysis of 5 j was held.

Conflict of Interest

None

References

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