

Construction and Research of University Medical Laboratory Safety Education Management System

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ABSTRACT

University laboratories play a vital role in experimental teaching and scientific research. As the basis of laboratory safety management, laboratory safety education is an important means to eliminate hidden dangers and improve the level of laboratory safety management. Combining the characteristics and safety risks of medical laboratories, this study adheres to the goal of people-oriented and life-first safety management. Construct and innovate the medical laboratory safety education management system from five aspects: building laboratory safety responsibility system, improving laboratory safety management system construction, improving laboratory safety management and protection system, strengthening laboratory safety education and publicity system construction and implementing laboratory safety inspection and rectification system, and improve the effectiveness of laboratory safety education, improve the comprehensive quality and safety awareness of laboratory personnel, form a good safety atmosphere for medical laboratories, ensuring the safe and stable operation of medical laboratories, and help the "double first-class" construction of universities and the construction of healthy China.

KEYWORDS

Laboratory safety; Safety education; Safety management; Management system; Medical laboratory.

1. INTRODUCTION

University laboratory is an important part of university educational equipment, a basic guarantee for teaching, scientific research and personnel training, and a major practice base for innovation and entrepreneurship education [1-3]. Medical laboratory involves a large number of high-risk experimental equipment and experimental projects, and has always been the focus of laboratory safety management in schools. With the continuous development and construction of medical laboratories in universities, the construction of medical laboratory safety education management system has become more and more important [4,5]. This paper discusses the construction and research of the university medical laboratory safety education management system, aiming to improve the laboratory safety management level, ensure the personal safety and property safety of teachers and students, improve the laboratory construction planning of local comprehensive universities, comprehensively improve the level and connotation of medical laboratory safety management, and help the university "double first-class" construction and healthy China construction.

2. CURRENT SITUATION OF MEDICAL LABORATORY SAFETY EDUCATION MANAGEMENT

At present, the vast majority of teaching and research laboratories in colleges and universities have established safety management systems, but many of them are mere forms, and the implementation is not in place^[6,7]. There are the following problems in the safety education management of university medical laboratory. First of all, the safety responsibility of some laboratories is not clear, the level of safety management is not high, and the lack of professional safety management personnel. Secondly, the safety management system of some laboratories is not sound, and the lack of scientific and standardized safety management system leads to increased laboratory safety risks. In addition, the safety protection measures of some laboratories are not in place, and there are security risks, such as expired fire facilities and imperfect ventilation systems. Finally, the safety education publicity of some laboratories is not enough, the laboratory safety education model is single, the education method is backward, the training program and means are lack, the choice is small, the safety awareness of students is not strong, the lack of self-protection ability.

3. CONSTRUCTION OF MEDICAL LABORATORY SAFETY EDUCATION MANAGEMENT SYSTEM

Aiming at the problems existing in medical laboratory safety education, combined with the characteristics of medical laboratory safety management, To construct and innovate the medical laboratory safety education management system from five aspects: building laboratory safety responsibility system, improving laboratory safety management system, improving laboratory safety management and protection system, strengthening laboratory safety education and publicity system construction and implementing laboratory safety inspection and rectification system.

3.1. Establish the laboratory safety responsibility system and clarify the responsibilities of laboratory safety management

Laboratory safety management involves multiple links, multiple departments, to build a sound laboratory safety management system, first of all, scientific top-level design, to build a strong organizational system: The laboratory safety responsibility of the department is carefully divided, and a three-level laboratory safety responsibility system of the department, experiment center and laboratory is established. The dean and secretary of the department are responsible for the safety work of the department, and they are the first responsible persons for the safety work of the department. The director of the laboratory safety work of the experiment center is the laboratory director of the scientific research center and the teaching center. The person in charge of each laboratory and the experimenter is the person directly responsible for the safety work of the laboratory. The department signed a "Laboratory safety Management Responsibility letter" with the relevant responsible person, requiring each laboratory to put forward potential safety hazards, relevant safety management responsibilities to people, and pasted at the door of the laboratory, strictly "who is in charge, who is responsible".

3.2. Improve the construction of laboratory safety management system and improve the system guarantee for laboratory safety management

Combined with the actual situation of medical laboratories in local universities, improve the laboratory safety management system: first, the laboratory safety risk assessment system. It is necessary to conduct risk assessment on the teaching and research activities carried out by the laboratory, strictly manage all kinds of dangerous sources such as dangerous chemicals, pathogenic microorganisms, radiation sources, etc., and establish strict and comprehensive management systems

in the procurement, transportation, storage, use, disposal and other processes of dangerous sources. The safety access of experimental personnel and the experimental process shall be strictly controlled. The second is to establish a laboratory safety work rights and responsibilities management system. Formulate a coordinated management system with clear responsibilities and clear tasks to ensure that from the top level to the management level and then to the grass-roots level, safety management responsibilities are progressively and interlinked. Third, the establishment of laboratory safety routine management system. According to its own reality and subject characteristics, the establishment of macro-micro adaptation, scientific integrity, operational conventional management system. Fourth, the establishment of laboratory safety emergency system. Formulate standardized and feasible special emergency plan and department emergency plan on laboratory safety, and do a good job in the publicity, education, training and exercise of emergency knowledge and emergency handling.

3.3. Improve the laboratory safety management and protection system to provide material guarantee for laboratory safety management

Combined with the actual work of medical laboratory, the laboratory safety management information system is established, equipped with safety protection equipment and facilities, and linked with the information system to create a safe and high-quality experimental environment for teachers and students. First, strengthen the construction of laboratory infrastructure. Laboratory firewall, security door, safety exit, etc., must meet the national security standards; The laying of laboratory water, electricity and gas pipelines and the placement of ventilation system instruments and equipment must meet the specified requirements. The second is to strengthen the protection of laboratory fire facilities, reasonable allocation of corresponding fire equipment and anti-theft, fire alarm systems in the laboratory and regular inspection and replacement. The third is to strengthen laboratory professional protection. To strengthen the supervision and management of the procurement, use, storage and disposal of toxic and harmful chemicals in view of laboratory chemical safety; For biosafety, biological waste waste is transferred to specialized medical waste treatment institutions, and biological experimental equipment and consumables are centrally autoclaved. In view of radiation safety, while providing protective equipment and safe working conditions, training and management of staff should be strengthened, and waste source waste should be collected and destroyed in a timely manner. Fourth, we will strengthen information technology protection. The laboratory access system is cooperated with the access control management system to achieve information and intensive management and improve the laboratory monitoring and management system.

3.4. Strengthen the construction of laboratory safety education and publicity system to facilitate the normalization and long-term management of laboratory safety education

Combined with the actual work of medical laboratory, strengthen laboratory safety education and publicity, and facilitate the normal and long-term laboratory safety education. First, to carry out the "Laboratory safety Culture Month" series of education activities, during the laboratory safety culture month, organize teachers and students to watch safety warning films; Make a safety banner and hang it in a prominent position in the laboratory building; Production of safety publicity exhibition board, in the hall of medical buildings, including laboratory accident case analysis of universities, experimental operation "safety song"; Organize students to conduct a short laboratory safety video creation competition, which mainly focuses on experiment preparation and basic safety, including the role of safety information boards, strict adherence to equipment operation procedures, confirmation of emergency exits and fire exits, placement and hygiene of articles, prohibition of eating and drinking in the laboratory, prohibition of wearing in the laboratory, etc. Finally, organize work review. The winning works will be rewarded and promoted through wechat public account, video account, Douyin, B station and other online platforms, and other works will be spiritually encouraged; Second, organize teachers and students to participate in laboratory safety training, provide on-site scene drills, and

conduct systematic training on laboratory safety-related laws and regulations, laboratory safety knowledge, types and causes of emergencies, emergency measures, etc., demonstrate the hazards caused by safety accidents, reduce laboratory risks, and form a regular mechanism for laboratory safety training. After the training, It is necessary to objectively evaluate the training effect and record the training feedback, so as to enrich the safety knowledge of teachers and students and improve their safety awareness, so that the safety awareness is gradually deeply rooted in the people's mind, and ensure the publicity effect of laboratory safety.

3.5. Implement the laboratory safety inspection and rectification system, attach importance to effectiveness, and supervise the implementation of accountability work

Safety inspection is an important means to ensure the safety of the laboratory, and the implementation of the regular laboratory safety inspection needs to be implemented. First, the establishment of the "whole process, all elements, full coverage" laboratory safety inspection and investigation system, focusing on the investigation and rectification of flammable, explosive, highly toxic, and easily manufactured chemical safety and biosafety hazards, timely rectification of the problems found, and in written form to inform the laboratory of all kinds of safety hazards, and require rectification within a time limit until the rectification is qualified. The second is to incorporate the implementation of laboratory safety work into the work assessment content, establish a reward and punishment mechanism and accountability mechanism, commend and reward those who excel in performance, and criticize and punish those who lag in performance; The relevant units and individuals involved in safety accidents shall be seriously investigated for their responsibilities and given corresponding punishments. The relevant departments of the school shall be held accountable for those units and individuals who cannot do laboratory safety work properly, such as system implementation, safety inspection, hidden danger rectification and other problems, and put forward rectification suggestions.

4. IMPLEMENTATION RESULTS

In accordance with the requirements of "Party and government responsibility, one post and two responsibilities, joint management, dereliction of duty and accountability", the college adheres to the work idea of "highlighting the key points, consolidating the responsibility, paying equal attention to inspection and reform, and emphasizing on effectiveness", and has achieved some results after implementing the above program in the medical laboratory safety management.

4.1. Clear responsibility for laboratory safety management

Through the signing of the "Laboratory Safety Management Responsibility Letter" with the department and relevant responsible persons, each laboratory has raised potential safety risks, and the relevant safety management responsibilities have been clearly implemented. This initiative has effectively promoted the laboratory safety management and clarified the principle of "who is in charge, who is responsible".

4.2. Laboratory safety management system has been improved

By improving the construction of laboratory safety management system, including laboratory safety risk assessment system, laboratory safety work rights and responsibilities management system, laboratory safety routine management system and laboratory safety emergency response system, institutional guarantee is provided for laboratory safety management. The establishment and implementation of these systems have effectively improved the level of laboratory safety management.

4.3. Laboratory safety management and protection system has been continuously improved

By strengthening the construction of laboratory infrastructure, strengthening the protection of laboratory fire protection facilities, strengthening the professional protection of the laboratory and strengthening the protection of information technology and other measures, the laboratory safety management information system has been established, equipped with safety protection equipment and facilities, and linked with the information system, creating a safe and high-quality experimental environment for teachers and students.

4.4. Strengthening of laboratory safety education and publicity system

Through carrying out a series of propaganda and education activities such as "Laboratory Safety Culture Month", organizing teachers and students to participate in laboratory safety training and demonstrating the hazards caused by safety accidents, etc., laboratory safety education and publicity have been strengthened, and it is easy to carry out normal and long-term laboratory safety education. These measures improve the safety awareness and safety knowledge level of teachers and students, making the safety awareness gradually deeply rooted in people's hearts.

4.5. Implementation of laboratory safety inspection and rectification system

Through the establishment of the "whole process, all elements, and full coverage" laboratory safety inspection and investigation system, the focus is on the investigation and rectification of flammable, explosive, highly toxic, and easily fabricated chemical safety and biosafety hazards, and the timely discovery and rectification of safety hazards. At the same time, the implementation of laboratory safety work is included in the work assessment content, and a reward and punishment mechanism and an accountability mechanism are established to commend and reward those who excel in performance, and criticize and punish those who lag in performance. These measures have effectively implemented the laboratory safety management work and improved the level of laboratory safety management.

5. CONCLUDING REMARKS

Safety is the basic guarantee for the continuous development of education and the growth of students. Without security, nothing can be said^[8,9]. With the transformation of higher education from quantity expansion to quality improvement, from scale development to connotation construction. In this process, laboratory as an important part of the university, its safety management work is also facing higher and higher requirements. As a special kind of university laboratory, medical laboratory involves a large number of biological, chemical and other dangerous goods, and its safety management is particularly important. However, the construction and research of university medical laboratory safety education management system is a long-term and arduous task, and the research and exploration of medical laboratory safety education management system should be continuously strengthened in the later stage, and the laboratory safety education management system and content should be constantly improved to improve the pertinence and effectiveness of laboratory safety education. At the same time, we should strengthen the integration and sharing of resources, promote the integration of laboratory safety education and safety management, combine safety education with scientific and technological innovation, and promote the continuous development of safety education and management of medical laboratories in colleges and universities. This will not only make the safety management of medical laboratories in the university scientific and standardized, but also help the construction of "double first-class" universities and the construction of healthy China. It can also provide reference for other colleges and universities offering medical education in China.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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