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Research on Safety and Management Countermeasures of Experimental Teaching Based on Traditional Chinese Medicine

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Abstract

Undergraduate experimental teaching of Chinese pharmacy is an important part of the training of senior Chinese pharmacy professionals. The Chinese pharmacy laboratory has relatively many types of flammable, explosive and toxic chemicals. Experimental managers, teachers and professional students have more opportunities to contact such toxic substances and are not concentrated in management, which makes potential accidents easy in experimental teaching. Based on the under-standardization of the experimental teaching management mechanism, the existing experimental teaching mode is not high in students' initiative and participation, and these flammable, explosive and toxic reagents are contacted and used during the experiment. Drugs, storage and post-processing of these drugs have potential safety hazards. To this end, the school has carried out effective research on the safety management of experimental teaching of Chinese pharmacy in order to strengthen the standard construction of laboratory infrastructure and improve the system construction of experimental safety management.

Keywords

Traditional Chinese medicine; Experimental teaching; Safety management.

1. INTRODUCTION

The Chinese pharmacy is a major with many disciplines and strong applications. Experimental teaching plays an important role in talent cultivation [1]. Safety management is the top priority of laboratory management. Management and teaching staff can eliminate safety hazards in time, avoid safety accidents, and cultivate students' safety awareness [2]. The Chinese medicine chemistry laboratory has a commonality with the basic chemistry laboratory and has its own characteristics. Due to the use of volatile, low boiling point, irritating and other flammable and explosive toxic chemical reagents, coupled with the student's operation has a certain randomness, resulting in a certain safety hazard in the Chinese medicine chemistry laboratory[3]. Improper management and control in management or teaching or research may result in damage to facilities and equipment, and even death or injury [4]. Based on this, this paper takes the safety of traditional Chinese medicine chemistry experiment teaching as the main line, and explores the ideas and strategies for promoting the discipline of Chinese pharmacy and building high-level laboratories.

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2. THE CHARACTERISTICS OF TRADITIONAL CHINESE MEDICINE CHEMISTRY EXPERIMENT TEACHING

2.1. Complex Nature of the Reagent

Verification and design experiments generally use petroleum ether, ethanol, methanol, ether, chloroform, dichloromethane, ethyl acetate, sulfuric acid, sodium hydroxide and other chemical reagents, which are flammable, explosive, toxic, corrosive and so on. It can cause injury or pollution to people, equipment, environment, etc [5].

2.2. Longer Experiment Time

Design or comprehensive experiments often require a certain degree of continuity, sometimes extraction and separation studies take more than 8 hours each time. Since the electric heating sleeve, the rotary evaporator, the vacuum pump, and the circulating water cooling device need to be continuously used, it is inevitable that there is a hidden circuit in the experimental process, so that the circuit is short-circuited, and even an electric shock occurs[6].

2.3. More Types of Garbage

Many wastes or wastes are produced in the chemical experiment of traditional Chinese medicine, such as chemical waste liquid, mostly organic reagents, and the composition is complex and the quantity is relatively large [7]. The volatile solvent is easy to produce chemical waste gas during the experiment; in addition, the extracted dregs and reagents are still available. Different garbage such as bottles and disposable supplies.

2.4. Personnel Participate in Concentration

During the experiment, due to the large number of participants and the number of participants, chemical reagents, glass instruments, and experimental equipment are used intensively. Chemical reagents are often placed in disorder, and chemical waste is disposed of at will, resulting in increased flammable and explosive concentrations and toxic corrosion. Exposure of reagents poses a safety hazard to the experimenter, equipment and the environment.

3. THE SAFETY RISK OF THE CHINESE MEDICINE CHEMISTRY EXPERIMENT TEACHING

3.1. Safety Education Is Not in Place

The state attaches great importance to the development of the Chinese medicine industry, continuously strengthens the strategic planning and top-level design of the reform and development of Chinese medicine, and lists the development of Chinese medicine as a national strategy, and has successively issued a series of policy measures [8]. Colleges and universities have increased the intensity of Chinese medicine education and scientific research, and attached importance to the cultivation of students' comprehensive abilities, especially the improvement of experimental skills. Therefore, it is required to improve the proportion of design and comprehensive tests in the experimental courses, but the laboratory safety education has not been timely provided. Progressive, experimental teaching and safety management also lacked perfect mechanisms, resulting in weak safety awareness among some students.

3.2. Imperfect Drug Management Is Not Perfect

There are many kinds of drugs used in traditional Chinese medicine chemistry laboratories. Different reagents and drugs (referred to as test drugs) have different properties, and toxic and harmful, flammable and explosive people account for a relatively high proportion. If it is directly

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exposed to the external environment, it is easy to cause harm to the experimenter, the experimental environment, and the like. In the course of experimental operation, especially the design experimental process is immature and variable, which has more influencing factors, which improves the high risk of the laboratory and the uncontrollable accident. Teachers pay too much attention to the completion of teaching tasks in teaching, ignoring the safety supervision of chemicals.

3.3. Experimental Operation Is Not Standardized

Experimental students have insufficient predictions about the problems that may occur during the operation. Most students do not consider how to deal with possible safety accidents and how to respond correctly and effectively when safety accidents occur. Many students know very little about the characteristics and storage requirements of special chemical reagents. They do not isolate and store flammable and explosive reagents at low temperatures, which undoubtedly increases the safety hazards of the laboratory [9]. Although most students value the correct operation of the instrument, they ignore the safety hazards that should be noted when using the instrument for a long time. Some students appeared in the experiment to deal with the behavior of reagents and drugs at random. If the reagent waste liquid was not collected according to the regulations, it was directly poured into the water tank; the medicine was mixed with ordinary garbage, which caused environmental pollution and personnel harm.

3.4. Self-Protection Awareness Is Weak

In the traditional Chinese medicine chemistry experiment, the most contact is the different chemical reagents. Most chemical reagents are volatile, and some reagents have certain toxicity. If excessive inhalation, it will endanger health, increase concentration and even cause explosion risk. Based on this, the laboratory needs to install a ventilation system and a fume hood. Students sometimes do not perform reagent configuration and experimental operations in the fume hood, causing the laboratory air to be filled with chemical reagents, which can cause damage to the experimenter and others. Ventilation systems and fume hoods should be regularly checked for proper operation to ensure that the ventilation system and fume hood are working effectively.

4. THE SAFETY OF CHINESE MEDICINE EXPERIMENTAL TEACHING

4.1. Strengthen Safety Education

Carry out comprehensive and multi-level safety training, and encourage experimental personnel to participate in training in standard operation, maintenance and safety management, and conduct regular safety assessment and review of experimental personnel. The security department regularly conducts laboratory safety knowledge lectures for teachers and students, and arranges teachers and students to participate in a safety fire drill every academic year. The first lesson of each experimental class is required to introduce the laboratory with the teacher and to carry out safety education for the students of traditional Chinese medicine. Safety education panels are placed on the walls of the corridors and labs to create a laboratory safety culture. Laboratory management personnel perform their duties and duties, strengthen the supervision of the experimental process, and eliminate potential safety hazards in the bud.

4.2. Improving the Level of Reagent Management

There are many kinds of reagents in the Chinese medicine chemistry laboratory, and scientific classification is carried out according to their different characteristics. Store common chemical reagents in the reagent cabinet with adsorption function to reduce the pollution and damage of volatile reagents to people and the environment. Inflammable and explosive low-boiling reagents are stored in explosion-proof refrigerators to minimize their potential hazards at room

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temperature. It is forbidden to store the solution of the organic reagent configuration in the laboratory refrigerator to avoid the explosion of the refrigerator caused by the volatilization of the organic reagent. During the experiment, if temperature and pressure control or the use of flammable and explosive gases are involved, strict control and supervision should be carried out to avoid unpredictable accidents.

4.3. Improving the Experimental System Specification

According to the characteristics of each laboratory, the traditional Chinese medicine chemistry laboratory safety is established on the basis of the regulations such as "Laboratory Safety Management Measures", "Laboratory Safety Management Rules" and "Laboratory Equipment and Equipment Management Measures". Management systems, including laboratory waste sorting methods, safety tester manuals, hazardous chemicals management systems and emergency treatment programs, are prerequisites for ensuring the safe use of laboratories and improving laboratory safety management. Check the water, electricity, windows, reagents, instruments, etc. of the laboratory before going to work every day to make relevant records.

4.4. Increasing the Construction of Safety Facilities

In order to ensure the safety of the experiment, the Chinese medicine chemistry laboratory was transformed. The test bench is made of epoxy resin board which is resistant to acid and alkali, high temperature, flame retardant and easy to repair. In combination with the characteristics of the subject, an eye wash device and a shower device are installed in the corridor to facilitate the timely treatment of organic reagents splashed into the eyes or on the skin. The circuit is modified to use large-capacity wires to ensure safe use of electric ceramic stoves, hair dryers, and electric ovens. The sewers are made of acid-resistant and corrosion-resistant PVC pipes; fire extinguishers, fume hoods, smoke alarms, etc. are installed in the laboratory. In order to prevent accidental injury, the laboratory is equipped with a first aid kit, which is equipped with disinfectant alcohol, safflower oil, weak acid and weak base reagent, band-aid, gauze and so on.

Laboratory safety is one of the management objectives of building a safe campus in colleges and universities, and it is also one of the supporting conditions for the certification of Chinese medicine. Take measures of "human defense", "physical defense" and "technical defense" to improve the safety awareness of teachers and students, standardize the safety management of laboratories, and effectively protect personal safety and property safety. Laboratory safety construction is not only a process of continuous improvement and continuous improvement, but also an arduous and long-term work, which requires the joint efforts of management personnel and teachers and students.

5. CONCLUSION

In summary, the traditional Chinese medicine experiment is the key link for cultivating innovative talents in Chinese pharmacy. The Chinese pharmacy laboratory is an important battlefield for cultivating the practical ability of Chinese pharmacy professionals. It is necessary to clarify the positive role of laboratories in teaching and face the current laboratory. The existing problems, the development of scientific and effective management methods, to improve the efficiency of laboratory management, the courage to innovate and try. Continuously improve the management level of university laboratories, expand ideas and visions, and introduce effective management methods. These will provide a better experimental environment for Chinese pharmacy professionals, and also for the cultivation of high-level Chinese pharmacy innovative talents.

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