

## The Proportion and The Impact of Human Factor in The Causes of Laboratory Accidents

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Laboratory safety is a new topic for safety research, and during operating a risky experiment, people is always highly involved, so the issue about human factor is considerable. According to many published sources, human factor is always the main reason for industrial accidents. However, compared with the research on human factor for safety in industry, there is limited research on human factor in laboratory safety. Therefore, some particular efforts should be done to indicate how important the human factor is in laboratory safety.

In order to address this problem, this study collects the information about 90 accidents happened in different kinds of laboratories (Chemical-related, mechanical related, biological-related, and other) from 1991 to 2021. Then by using descriptive statistical analysis and ANOVA method to analyse all of the collected accident information. With the information of 90 laboratory accidents, the proportions of human factor as direct causes and indirect reasons for all accidents in different kinds of laboratory accidents are analysed respectively; and the impact of human factor in laboratory accidents that have casualties is also analysed by ANOVA approach.

The results indicate that no matter what kinds of laboratory, human factor has the highest proportion among the direct and indirect reasons of all accidents. Besides, in the accidents that have casualties, human factor also cover the largest proportion. In addition, the ANOVA result indicates that influence of human factor is significantly higher than other reasons in laboratory accidents that have casualties, and for the accidents with casualties in different kinds of laboratory, human factor has the same influence. In one word, human factor has considerable influence to laboratory safety no matter what kind of a laboratory is. In future, particular research on human error identification, human error prevention, and human error probability estimation should be deeply carried out to address human factor issue for promoting laboratory safety.

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