Investigation and Research on Food Safety Knowledge, Attitude and Behavior of University Students in Kunming Based on Big Data Analysis

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Abstract. This article uses questionnaire surveys, combined with computer big data analysis, to study the food safety knowledge, attitudes and behaviors of college students in Kunming. The results show that the awareness rate of safety knowledge of the respondents is low, and their attitude and behavior need to be improved. It is necessary for colleges and universities to carry out food safety publicity and education in various ways, to help college students establish a positive and correct attitude towards food safety, and to guide college students to develop good food safety behavior habits.

Keywords: College Student, Food Safety, Knowledge-Attitude-Behavior, Big Data Analysis

1. Introduction
In recent years, with the growing contradiction of food safety in China, food-borne diseases caused by poisoning incidents occur from time to time, which will inevitably bring impact and challenges to the dietary safety of college students with a huge body. As a special consumer group, college students will become the leader of the future food consumption trend. Their knowledge of food safety, attitudes and specific behavior habits will not only affect their physical and mental health, but also affect the surrounding and wider population[1]. Therefore, it is of great significance to do a good job in publicity and education of food safety knowledge among college students, to strengthen their food safety awareness, and to guide the formation of good habits for college students to safeguard campus food safety, and to carry out the responsibility of cultural education in Colleges and universities. Based on this, this study investigates and analyses the current situation of food safety KAP among college students in Kunming, in order to provide a basis for the normal and diversified food safety education activities in Colleges and universities.
2. Objects and methods

2.1. Objects

Objects / Participants: College students in Kunming from February to May 2019.

2.2. Methods

On the basis of literature research and expert consultation, self-designed questionnaires were conducted through the online platform of “Questionnaire Star”[2,3]. The questionnaire is composed of basic information, food safety knowledge, attitude, behavior and other components. The knowledge and attitude parts are scored in percentage system. A one-week pre-survey of a small sample before the formal investigation, and timely correction of the problems found, to ensure that the topic is clearly expressed and the options are unambiguous. At the end of the survey, the data of the first questionnaire filled in by the same IP address were retained according to the time. SPSS 20.0 was used for statistical analysis. The difference was statistically significant with \( P < 0.05 \).

3. Results

3.1. Basic information

Among the 1229 respondents, 300 were boys, 929 were girls, 809 were rural students, 420 were urban students, 443 had taken food related courses and 786 had not taken food related courses.

3.2. Awareness of food safety knowledge

82.42% of college students have general ideas on the difference among organic, pollution-free and green food. The correct rates of the four questions of "toxicity of uncooked kidney beans", "antibiotics and hormone residues in meat and aquatic products", "sufficient heating before leftovers" and "reasonable use of food additives according to regulations" were all above 69.98%. However, the awareness rates of "the main carcinogens contained in barbecue", "the meaning of food shelf-life" and "the lower temperature limit for takeaway food" among college students were lower, which were only 18.88%, 49.06% and 34.91% respectively. The average score of food safety knowledge of 1229 college students was 61.66 (±14.16). 52.48% of the students had more than 60 points. Only 15.05% of the students had food safety knowledge score higher than 80 points. In addition, the students who had taken food courses scored higher than those who had not \( (P = 0.042) \), as shown in Table 1.

| Basic information | items         | Knowledge score | t    | P     | Attitude score | t      | P     |
|-------------------|---------------|-----------------|------|-------|----------------|--------|-------|
|                   | Male          | 61.17±14.73     | 0.695| 0.487 | 61.92±23.46    | 1.423  | 0.155 |
|                   | Female        | 61.82±13.98     |      |       | 64.07±20.52    |        |       |
|                   | Countryside   | 62.04±13.97     | 1.291| 0.197 | 63.42±20.90    | 1.777  | 0.076 |
|                   | City/Town     | 60.93±14.50     |      |       | 62.05±21.95    |        |       |
|                   | Yes           | 62.75±14.25     | 2.034| 0.042 | 66.69±21.80    | 3.866  | <0.00 |
|                   | No            | 61.05±14.08     |      |       | 61.77±20.80    |        |       |

3.3. Attitudes on food safety

14.97% of college students are very concerned about food safety, and the attention of those who have taken relevant courses is higher than that of those who have not taken relevant courses (max. \( \chi^2 = 12.965, P = 0.005 \)); 85.44% of college students want to know more about food safety and nutrition, and the expectation of female students is higher than that of male students (\( \chi^2 = 16.149, P = 0.001 \)). At the same time, 78.60% of college students are willing to publicize food safety knowledge to others. Girls and students who have taken relevant courses are more willing \( (P < 0.001) \). About the necessity of food safety education for college students, 91.94% of college students think it is necessary, and
48.98% of them think it is necessary. There are significant differences in gender and course selection. 88.93% of college students are willing to change their bad eating habits. There are significant differences in gender, student origin and course selection among the groups. The average score of food attitude of 1229 college students was 63.54 (±21.28). The score of attitude of college students who had taken relevant courses was higher than that of non-students $(P < 0.001)$. As shown in table 1.

### 3.4. Current status of food safety behavior

25.71% of college students had the habit of washing their hands before meals or food processing; 33.69% of college students carefully checked their ingredients and shelf life when they bought food. Girls and urban students were better than boys and rural students $(P < 0.05)$; 94.63% of college students barbecued 0-2 times a week, and less than 6% of them had 3-5 times and higher frequency. There was significant difference between men and women ($\chi^2 = 16.691, P < 0.001$); school canteen was the place that 82.51% of college students often chose to eat, while 17.49% preferred to go to small restaurants or roadside stalls. There was a significant difference in the source group $(P < 0.001)$. In dealing with the problem food, 43.21% of the college students negotiated with the operator for compensation, 21.64% of the college students complained to the relevant departments, and 35.15% chose to consider themselves unlucky and not to prosecute, differences in gender and source group were statistically significant.

### 3.5. Others

In terms of access to food safety knowledge, 64.28% of college students said that through the Internet, television, newspapers and periodicals, 21.64% of them were classroom learning, propaganda and education, and the rest of the ways accounted for less than 10%. 23.19% of the college students were unsatisfied with the food safety in the school canteen.

### 4. Conclusion

Through the survey and research on the food safety knowledge, attitude and behavior of college students in Kunming based on big data analysis, it is not difficult to find that the food safety knowledge score of the respondents is generally low, especially in the specific cognitive deficiencies, suggesting that it is necessary for universities to carry out comprehensive and in-depth knowledge education. The total score of knowledge of those who have taken food-related courses is higher than those who have not $(P < 0.05)$, which shows that centralized and systematic classroom learning and education is still an effective way to improve food safety knowledge of college students. However, the respondents showed a low awareness rate in the responses to food knowledge which college students were very keen on, such as "barbecue" and "takeaway", and there was no significant difference in the course selection group. It is speculated that the possible reason is that the classroom learning and education focused on the traditional nutrition and health knowledge under the limited class hours. Therefore, the extension and expansion of safety knowledge cannot be well combined with the education object itself.

As for attitude, if each item is ranked better among the progressive options, the total score of the five attitude questions is 50, while the actual score of the survey is 63.54 (±21.28), which means that the respondents show a more positive attitude on the whole. More than 80% of college students want to know more about food safety and nutrition, suggesting that most of them are worried about their knowledge reserves and expect more knowledge input, which is consistent with the survey results of 91.94% of college students who think it necessary to carry out food safety education. Therefore, colleges and universities should base themselves on the object of education, optimize the content of education, and give full play to the advantages of new media, and carry out various and complementary propaganda activities in and out of class, online and offline. The results of the survey on food safety concerns and the willingness to publicize food safety knowledge to the people around us show that those who have taken relevant courses have better attitudes than those who have not $(P < 0.05)$. It shows that college students who have received classroom learning education are more
sensitive to food safety issues and are willing to share their knowledge with others as communicators and expect to achieve the unity of knowledge and practice. In addition, although there was no significant gender difference in the total score of attitudes ($P > 0.05$), female students showed more prominent attitudes on many issues. The reason may be that women's traditional social roles are different from men's, and they often take on more responsibilities of family members' daily diet, so they are more concerned about their knowledge, habits and the impact on the surrounding population.

Less than 30.00% of the students wash their hands before meals or food processing, indicating that the cultivation of good hygienic habits of college students needs further guidance. Girls and urban students perform better in checking the information of pre-ordered food. The reason may be that girls have delicate minds, while urban students may be affected positively by family and growth environment. 17.49% of college students said they would often go to small restaurants or roadside stalls. The reasons may be related to the rich food, good taste and low food safety satisfaction of school canteens (76.81%). It suggests that colleges and universities should further strengthen the food safety guarantee of school canteens, enrich food types, and improve the dining environment and food flavour. In the case of infringement of inferior food, 64.85% of the respondents chose to defend their rights through legal means, which is a significant improvement compared with the weak supervision and awareness of safeguarding rights of college students in previous studies\cite{5,6}. And the awakening of this awareness has far-reaching significance for China to speed up the construction of a strict and efficient food safety governance system with social co-governance.

**Acknowledgements**

Fund Project: Scientific Research Fund Project of Yunnan Provincial Department of Education (2018JS318).

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