

Effectiveness of Catering Owners' Knowledge in Early Warning of Food Poisoning Outbreaks in Medan City

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ABSTRACT

Food poisoning outbreaks are a serious problem that can have a significant impact on public health. Food poisoning occurs when food consumed is contaminated with bacteria, viruses, parasites, or hazardous chemicals. Medan City experiences fluctuating food poisoning incidents, so continuous monitoring is needed to identify and address the causes. The purpose of this study was to determine early warning by using a module to prevent food poisoning outbreaks. This study was conducted quantitatively using an experimental design with the one group pretest-posttest design (before and after) approach. The location of the study was carried out at the Medan City Health Office and a population of 20 respondents, while the sample, namely the total population, was the sample. The data obtained were analyzed univariately, bivariately. The results showed that knowledge in catering owners with $n = 20$, paired sample T-test there was a significant difference between the level of knowledge of respondents about food poisoning before and after the intervention using the module p value = 0.0001 (<0.05). The module that has been developed and validated by language experts with results of 94.3, material experts with 97.3 and media experts with 91.3 can effectively prevent poisoning. It is recommended to the local Health Service and Health Center to be able to use the module as an early warning model for food poisoning outbreaks, especially for catering business owners, so that they can increase knowledge, especially in carrying out prevention.

Keywords: Knowledge, Early Warning, Outbreak, Food Poisoning.

INTRODUCTION

According to data collected by (Mehlhorn, 2015), Food poisoning is a very common and dangerous disease worldwide, with one in ten people dying from eating contaminated food or foodborne illnesses, causing 420,000 deaths each year. In the United States, an estimated 48 million cases of food poisoning occur each year. Foodborne diseases, also known as foodborne diseases by the World Health Organization (WHO), are infectious diseases or poisonings caused by bacteria or substances that enter the body through the food consumed.

According to the World Health Organization (WHO, 2020), The number of food poisoning cases continues to increase and is often associated with food contamination, which is a concern for people around the world. Since there are no reliable statistical data on this disease, the magnitude of its incidence cannot be estimated. However, the high incidence of diarrhea among infants and children provides insight into this situation. Approximately 1,500 million infants suffer from diarrhea each year, and more than 3 million children die as a direct result.

Ministry of Health of the Republic of Indonesia (2018) has declared an Extraordinary Event (KLB) of food poisoning and is ranked 2nd from the KLB reports submitted to the Public Health Emergency Operation Center (PHEOC), number 2 after diphtheria. The data recorded at the Ministry of Health is 163 in 2017 and 122 in 2018, and 133 in 2019. In 2019, 5958 cases were recorded with a Case Fatality Rate (CFR) of 0.4%. The trend of extraordinary food poisoning incidents based on provinces shows

that in the last three years (2017-2019) from the data above, it can be seen that cases in Indonesia in the 3 years have fluctuated, although there has been a decrease from 2017 to 2019, this does not guarantee that the incidents in Indonesia have decreased, so there must be continuous data so that the trend of extraordinary incidents can continue to be monitored.

Recorded in the Directorate General of Disease Prevention and Control (Dirjen P2P) according to the Indonesian Ministry of Health (2020), the number of food poisoning incidents in 2016 was 106 incidents with 4161 cases and a Case Fatality Rate (CFR) of 0.48%. Data on extraordinary food poisoning incidents from 2011 to 2016 were respectively (177, 312, and 233, 306, 164 and 48) incidents. The highest death rate occurred in 2016 with a CFR value of 0.95%. The data above shows that the number of incidents is still high each year. This illustrates that the handling of food poisoning outbreaks is still not optimal.

Based on the epidemiology of food poisoning in Indonesia according to (Mustika, 2019) every year in Indonesia there are always cases of food poisoning with a fairly high incidence rate. The Indonesian Food and Drug Administration in 2017 recorded that the number of people exposed to food poisoning was 5293 people. The cases of food poisoning outbreaks (cases) reported in 2017 were 2041 people sick, 3 people died with an attack rate (AR) of 38.56% and a case fatality rate (CFR) of 0.15%. This shows that extraordinary events (KLB) of food poisoning are still a public health problem that needs to be prioritized for handling.

Place/location of food poisoning outbreak according to (Mustika, 2019) said that the most food poisoning incidents in Indonesia occurred in homes, namely 25 incidents (47.17%), followed by incidents in educational institutions as many as 15 incidents (28.30%) with the most occurring in elementary schools (9 incidents) and junior high schools (MTs 6 incidents). Food poisoning outbreaks in homes generally occur during family events or religious celebrations such as weddings, circumcisions, aqiqah, tahlilan and others. The food served at these events is usually managed by the household itself. Food poisoning outbreaks in elementary schools are generally caused by snack foods contaminated by food bacteria.

Data reported in the North Sumatra Provincial Health Service Profile (2020) explained that of the 33 districts/cities consisting of 25 districts and 8 cities, where every year the number of extraordinary incidents of food poisoning is still found in the province of North Sumatra where in 33 districts/cities there have been fluctuations in the last 5 years with the highest death rate occurring in 2017 where 2 people died and in 2021 there was 1 person who died due to the food poisoning outbreak. Medan City itself as the research locus of the food poisoning outbreak figures in 2017 amounted to 132 cases, in 2018 there were 45 cases, in 2019 there was an increase of 127 cases and in 2021 there were 54 cases. The data above shows that the outbreak cases in Medan City have fluctuated over the past five years, so there must be ongoing early warning so that the outbreak cases can continue to be monitored and it is easy to carry out early warning as early as possible.

Feeding Asian Cities 2000 stated that there have been many studies conducted to see the characteristics of food in several cities in Asia, Africa and Latin America. This study has documented the importance of food safety from a social and economic perspective. The overall food trade in various cities, especially in Asia, can reach several million dollars. While the negative side of the existence of food is the low level of food hygiene and can disrupt the environment (Winiati et al., 2018)

According to research (Palupi., 2024) The government needs to improve food supervision and management by paying attention to hygiene and sanitation according to established food safety standards and increasing public knowledge and about how to properly manage food to improve food safety. According to research conducted by (Mutebi et al., 2022) In Uganda, there was an outbreak of food poisoning of 211 cases. From the results of interviews using a structured questionnaire about their potential exposure history, history of receiving and eating aid food, eating other foods, drinking unsafe water, and avoiding social gatherings. Several other researchers such as (Putri et al., 2021) shows that all catering services still do not meet physical eligibility in the application of hygiene and sanitation of catering services and the application of hygiene and sanitation of catering services in this catering service is expected to be a reference for obtaining a certificate of hygiene and information for the Health Service to verify the application of hygiene and sanitation of catering services.

The impact of food poisoning on the body includes symptoms of food poisoning and events after symptoms of food poisoning. The basic symptoms of food poisoning are vomiting, abdominal pain, diarrhea, and so on. There is no definite time limit for the symptoms of food poisoning to be felt by someone. Symptoms may appear within an hour after consuming contaminated food, but sometimes they can appear after several days or weeks. Common symptoms of food poisoning include abdominal pain, nausea, vomiting, diarrhea, fever, headache and so on (Nurmalasari et al., 2021)

Some groups are at greater risk of infection and complications from food poisoning. The first is the group of pregnant women who have a higher risk, this is because their bodies experience metabolic changes during pregnancy. Then the second group is elderly individuals who have a greater risk of contracting food poisoning because their immune systems cannot respond quickly to the presence of pathogenic microorganisms (Mustika, 2019).

Food safety is carried out through 3 pillars, namely the implementation of food safety by the government, business actors and the community. In this case, the regional government plays an important role as the vanguard in realizing food safety because it has been given a role, authority and responsibility in accordance with Law No. 23 of 2014 concerning regional government and Law No. 18 of 2012 concerning food (Limbardon et al., 2022)

This food poisoning outbreak must have a good early warning system, considering that food poisoning must be intervened immediately so that cases of morbidity and mortality data can continue to be monitored. Currently, the national early warning system uses the Early Warning Response (SKDR) module system with messages for the Province and Regency, but the SKDR module is still carried out between health workers and does not involve the community in the message system. So based on (Rasmaniar, 2020) stated that it is necessary to involve the community, individuals and organizations that are required to make reports of KLB alerts, including people who know of sufferers or suspected sufferers with potential for KLB. Currently, the reporting system used in Medan City is using the SKDR online reporting system to health workers which is sent via SMS/WhatsApp.

Based on interviews with the field of public health officers and the head of the surveillance work team in the field of Disease Prevention and Control Services (P2P) at the Medan City Health Office, the problem currently found is when food poisoning samples are not found by the inspector, this can have serious consequences for public health. However, in cases where food poisoning samples have been cleaned, health officers need to conduct further investigations to determine the cause of food poisoning and ensure that appropriate preventive measures are taken to prevent similar problems from occurring in the future. Another problem is that coordination between programs that must be carried out at the Medan City Health Office is very important to maintain public health and the absence of a business license for catering owners where the cause of food poisoning is from the catering owner so that they do not comply with food safety standards that have been set by health authorities, such as maintaining cleanliness and ensuring that the raw materials used are safe. Likewise, public awareness of the importance of early warning in avoiding food poisoning outbreaks is still low.

The reality and facts should be the concern of all parties, both health workers, catering owners, and the community as well as the health system itself. This shows that what has been carried out so far needs to be re-evaluated and requires new breakthroughs that are more innovative and adapt to the current situation to overcome the root of the health problem. So that the problem of traders' understanding of early warning of food poisoning outbreaks with their health needs to be improved. In addition to the reasons why the development of an early warning model is important because other reasons are that the current system is not specific in its implementation. Therefore, it is necessary to find a new form of innovation, namely a health education module that can help catering owners manage the risk of food contamination.

From the background and identification of the problems above, the researcher feels the need to conduct research as an effort to be aware of early warning of food poisoning outbreaks and as a form of effort to improve and maintain public health and safety and help improve the quality of public health in Indonesia.

METHODS

At this stage, the researcher used a quantitative type with this research design using an experimental design and the one group pretest-posttest design (before and after) approach. The place and time of this research were carried out in Medan City in April 2024, with the research location being the Medan Area Health Center. while the Population and Sample were catering owners located in the Medan Area Health Center area of Medan City and samples of catering owners located around the Medan City Health Center area who met the inclusion criteria were willing to be respondents and cooperative respondents. The intervention carried out was early warning of food poisoning outbreaks by involving catering owners in reporting the risk factors they experienced and carrying out follow-up actions including actions to catering owners in the form of providing information and education to traders using modules. Sampling used total sampling. Total sampling is a sampling technique where the number of samples is the same as the population (Sugiyono, 2019). The reason for taking total sampling is because according to Sugiyono the population is less than 100, the entire population is used as a research sample. So the sample in this study amounted to 20 people. Data collection was carried out by inviting catering owners to conduct socialization of the use of the module. While the operational definition in the study is the knowledge variable with the research instrument being a questionnaire that has been tested for validity and reliability. The results of the validity test obtained 15 questions about knowledge, the results were valid while the reliability results were reliable. Data analysis was carried out using univariate descriptive analysis to obtain an overview of early warning before and after using the intervention and Bivariate analysis to see the causal relationship between two or more research variables. Statistical analysis using the t test.

RESULTS

The frequency distribution of respondents' answers based on the pre-test and post-test questionnaire statement items regarding the level of knowledge can be seen in full in Figure 1.

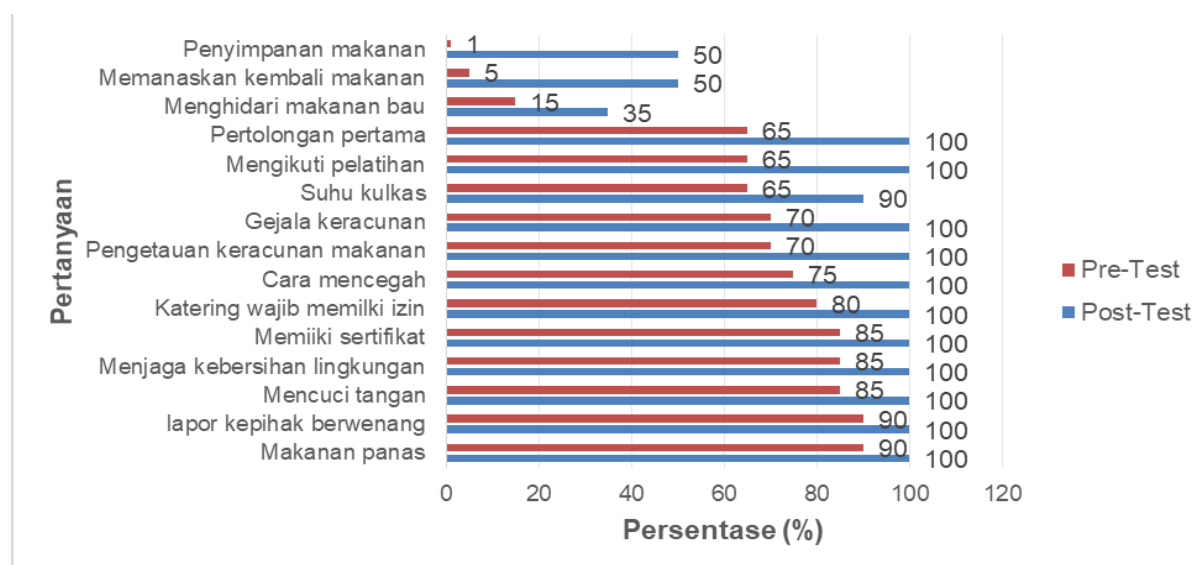


Figure 1. Level of knowledge regarding food poisoning with pre-test and post-test answers among catering owners at the Medan Area Health Center, Medan City.

Based on Figure 1. it can be seen that after the post-test there was an increase in the assessment score for each item of the respondent's knowledge level statement about the food poisoning outbreak. This figure shows that there was an increase in the respondent's knowledge level after being given the module socialization activity. The difference in the respondent's knowledge level before and after the socialization activity was analyzed using a paired t-test, the results of the analysis can be seen in Table 1.

Table 1. Knowledge Analysis of catering owners (n=20, paired sample T-test) at the Medan Area Health Center, Medan City

Variable Knowledge	Mean	SD	SE	p-value
Pre-Test	9.65	967	216	0,001
Post-Test	13.25	1.226	274	0,001

Based on the results of the analysis of table 1. it can be seen that there is a significant difference between the level of knowledge of respondents about food poisoning before and after the module intervention p value = 0.001 (<0.05). Furthermore, intervention activities were carried out on how to use the module that had been created, before the implementation test was carried out by each user. This implementation was carried out within a period of 2 weeks. In addition, through this implementation stage, feedback was also obtained from users which was useful as input for further improvements if necessary.

DISCUSSION

The results of the study show that food hygiene and sanitation supervision involves various activities, namely conducting periodic inspections of production facilities, equipment, raw materials and production processes, testing food products to ensure their safety and quality. (Salsabela, 2022) and provide training to personnel on good sanitation hygiene practices and record all monitoring activities and test results. By implementing good food sanitation hygiene principles, we can ensure the safety and quality of the food we consume (Retnani, 2022)

The Early Warning Model for Food Poisoning Outbreaks is a tool for preventing food poisoning outbreaks. The results of qualitative research indicate that the root of the problem of policy implementation in Medan City is the absence of a comprehensive and integrated model to improve health information to improve prevention performance. Through quantitative research results, it is also known that from the knowledge factor of catering owners, the factors that influence the behavior of catering owners in preventing food poisoning are the lack of information and education from health workers regarding early warning for food poisoning. Therefore, it is necessary to develop a "Model" in the form of a module for efforts to prevent food poisoning.

The module is designed and adjusted to the Instructions by the Ministry of Health of the Republic of Indonesia, by combining the role of catering. The module that has been built is then validated by material, media, and language experts with the aim of obtaining recognition or approval from experts regarding the suitability of the module to the needs so that the module is feasible and suitable for use. The assessment aspects carried out include system quality, information quality, service quality, content quality, display quality, material aspects, usability, integration, language feasibility, graphic feasibility, presentation feasibility, and contextual feasibility.

Based on the results of the validation test by experts, the module was declared to have passed the assessment because it had a percentage above 80% so that it was included in the "Very Eligible (SL)" criteria and could then be tested. Module trials by experts are very important in ensuring that the module developed for the prevention of food poisoning outbreaks functions well and is effective in achieving its objectives. Experts can ensure that all features in the module function according to the planned specifications. Expert trials allow developers to receive valuable feedback to refine the module before it is widely launched.

The social capital approach allows communities to learn from each other's experiences and adapt strategies that have proven effective elsewhere. Modules that support the exchange of knowledge and experience between communities can help spread best practices and innovations in food poisoning prevention. Previous studies have shown that collective learning and local adaptation are essential in addressing complex public health challenges (Salsabela, 2022)

The effectiveness of catering owners' knowledge in early warning of Extraordinary Events (KLB) of food poisoning in Medan City is a crucial factor in efforts to prevent public health incidents. According to the Health Belief Model theory, good knowledge of health risks, the benefits of preventive measures, and preparedness in facing potential hazards can improve preventive behavior in individuals. In the context of catering, owners who have a good understanding of food safety,

sanitation, and proper handling of food ingredients are more likely to implement preventive measures to avoid food contamination that can cause poisoning. A study conducted by (Salsabela, 2022) shows that increasing education and training for food business actors can significantly reduce the incidence of food poisoning.

In Medan City, which has a rapidly growing culinary industry, the risk of food poisoning outbreaks is a serious challenge, many catering owners do not yet have food safety certification and do not understand the basic principles of HACCP (Hazard Analysis and Critical Control Points), which play an important role in preventing the risk of food contamination. This lack of knowledge has the potential to increase the risk of food poisoning outbreaks, especially in catering that serves large numbers, such as weddings and celebrations. Therefore, a government policy that requires food safety training and certification for catering owners is very necessary to ensure the safety of food served to the public.

In addition, behavioral approaches such as the Planned Behavior theory emphasize that a person's intention to act in accordance with food safety standards is greatly influenced by knowledge, social norms, and behavioral control. If catering owners are given socialization and incentives to implement strict food hygiene and safety standards, then the likelihood of them complying with these rules will increase. Research conducted by (Palupi, 2022) found that regular training and supervision from the health department can increase early warning of potential food poisoning outbreaks in various regions of Indonesia. Thus, systematic education, strict certification, and effective supervision can increase the effectiveness of catering owners' knowledge in preventing food poisoning outbreaks in Medan City.

The results of the effectiveness test of the early warning module for food poisoning outbreaks were assessed through effectiveness indicators including system quality, information quality, service quality, user intention, user satisfaction, and net profit. Based on the analysis carried out, it is known that the results of the effectiveness test are in the very effective category because they have a percentage score interval ranging from 81 to 100%. Effectiveness testing is very important in assessing the feasibility of a module. Effectiveness testing helps ensure that the module functions as designed. This includes testing on language, writing, image quality, and colors that are easier to read. Effectiveness testing assesses the extent to which the module contributes to the main objective, the use of the module on catering behavior in preventing and handling poisoning.

CONCLUSIONS

The effectiveness of catering owners' knowledge in early warning of Extraordinary Events (KLB) of food poisoning in Medan City is highly dependent on their level of understanding of the principles of food safety, sanitation, and procedures for preventing contamination risks. The Health Belief Model and Theory of Planned Behavior theories emphasize that awareness of risk and social norms can influence the implementation of preventive measures in food management. Previous studies have also shown that food safety training and certification can increase preparedness in dealing with potential food poisoning incidents. Therefore, ongoing education, policies that support certification for catering owners, and strict supervision from related agencies are needed to ensure optimal implementation of food safety standards. These steps are expected to reduce the number of food poisoning incidents and improve the quality of catering services in Medan City.

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