

Practical classes more effective than theory classes in teaching food safety risks to children

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A team of researchers from a variety of Italian universities investigated methods of effectively communicating food safety risks to children. The researchers conducted a study in primary schools to evaluate children's understanding of microorganisms, following either a practical or theoretical teaching approach. After the study, all the children were found to have an improved understanding of microorganisms and their functions. Furthermore, it was found that children who were given the opportunity to actively participate in practical classes were more likely to have a stronger understanding of the context in which microorganisms are found, and their impact on people and the environment.

Children are a major at-risk group for contracting microbial foodborne illnesses; roughly half of the reported cases of foodborne illnesses occur in children, with the majority occurring in children under 15 years of age. While children have limited participation in food preparation procedures in the kitchen, which may influence food safety risks, behaviours such as hand washing and good personal hygiene can be introduced to them. Early food-safety interventions in primary schools could result in children gaining more information about food safety topics and consequently engaging in suitable protective behaviour. Children are also capable of communicating the information they learn at school to their families. Therefore, they also have the potential to improve adult knowledge and behaviour.

The study was conducted in 12 Italian public schools (six city based, six rural), with children aged between nine and eleven years old. Children were divided randomly into two groups with different types of interventions: either a practical or theoretical teaching approach. The practical group participated in three experiments designed to demonstrate microorganisms in their environments. Children observed bacterial growth from three different sources; air, saliva and hands (washed and unwashed). These children also received theoretical instructions on how to reduce the risk of foodborne illness, e.g. prevention of cross-contamination and safe food-handling procedures. The theoretical group did not participate in any experiments. The impact of the interventions on children's knowledge of microorganisms was evaluated using a combined approach of drawings (e.g. each child was asked to draw their representation of the relationship between microorganisms and humans) and interviews (a sample of children participated in semi-structured interviews). This combined approach was conducted before (i.e. pre) and after (i.e. post) intervention.

Analysis of the 492 drawings showed that their main features completely changed after the lessons. In both groups only 1% of children depicted microorganisms in humanised or cartoon form post-intervention, compared to 26.9% pre- intervention. However, post-intervention, children in the practical group more frequently represented the microorganisms in a specific context, e.g. the human body. In addition, a total of 30.8% of the practical group were able to define a link in their drawings between the action of a microorganism and its effects on people and the environment, compared to 17.1% of children in the theoretical group.

The answers from 141 interviews supported the finding that children in the practical group were better able to identify the environments in which microorganisms are typically found. Children from the practical group were more likely to mention the human body, the air and spoiled food as likely environments for microorganisms. Furthermore, topics such as the spread of microorganisms and measures to prevent contamination (e.g. covering your mouth when sneezing and food refrigeration) were more likely to be mentioned in the post-intervention interviews from children in the practical group.

The authors conclude that teachings on food safety can be effective in improving children's knowledge, particularly when a practical approach is applied. The practical approach resulted in a heightened awareness of the broader contexts surrounding microorganisms – their typical environments and contamination prevention measures, which would be important from a food safety perspective to encourage good hygiene practices in children. However, further tests are required to assess the changes in behavioural habits over a longer period. The authors also advocate further use of the combined approach of drawing and interviews as a useful strategy to evaluate learning of scientific concepts in children.

For further information, see: [Faccio E, Costa N, Losasso C, et al. \(2013\). What programs work to promote health for children? Exploring beliefs on microorganisms and on food safety control behaviour in primary schools. Food Control 33: 320-329.](#)