Exploring the Role of Dietitians in the Delivery of Food Safety Information

Victoria J. Gould,[1*] Ellen W. Evans,[2] Elizabeth C. Redmond,[2] Ingela M. Marklinder,[3] Jennifer J. Quinlan[4] and Sanja Ilic[5]

[1*]Dept. of Healthcare and Food, Cardiff School of Sport and Health Science, Cardiff Metropolitan University, Western Ave., Llandaff, Cardiff, Wales CF5 2YB

[2]ZERO2FIVE Food Industry Centre, Cardiff Metropolitan University, Western Ave., Llandaff, Cardiff, Wales CF5 2YB

[3]Dept. of Food Studies, Nutrition and Dietetics, Uppsala University, P.O. 560, SE-752 22, Uppsala, Sweden

[4]Dept. of Nutrition Sciences, Drexel University, 3141 Chestnut St., Philadelphia, PA 19104, USA

[5]Dept. of Food Science and Technology, The Ohio State University, Columbus, OH 43210, USA

SUMMARY

Individuals with compromised immunity are at increased risk of foodborne disease. Such individuals need to be made aware of risk-reducing food safety practices that can reduce the risk of foodborne disease in this population. Dietitians are regulated by law to assess, diagnose and treat dietary/nutritional problems, working directly, with individuals, and indirectly, through training/education of other health professionals. Identification of individuals who are at risk of foodborne illness is key to effective provision of any amount of food safety information to vulnerable patients. Food safety advice that dietitians provide to appropriate individuals could form part of their dietetic management, and research has found that the public has identified dietitians as health professionals they trust to provide food safety advice. However, gaps in food safety knowledge of registered dietitians are apparent, despite inclusion of food safety training in the undergraduate dietetic curriculum. The aim of this paper is to explore the potential role dietitians play in delivery of food safety information and consider this from an international perspective, as well as to determine potential opportunities to enable dietitians to deliver clinically applicable food safety information to consumers in order to help reduce their risk of foodborne disease.

OVERVIEW

Importance of domestic food safety for consumers at increased risk of foodborne disease

Foodborne diseases are a public health concern worldwide. According to a World Health Organization report on the global burden of foodborne disease, foodborne hazards cause an estimated 600 million cases of foodborne illness and 420,000 deaths annually *(48)*. Consumers most 'at risk' for foodborne disease and subsequent death are older adults, pregnant women, immune-compromised individuals, and children younger than age five *(48)*. This is due in part to increased susceptibility to infection from deceased numbers of organisms *(30)*, that could be caused by disease or by medications that compromised the immune system *(23)*. Risk of infection from listeriosis, especially, is higher in those with compromised immunity *(38)*. Malnutrition, prevalent in many different population groups, has also been shown to be a factor that increases the risk of diarrheal diseases *(29)*. Ensuring the microbiological safety of food is therefore particularly important to at-risk populations and other susceptible consumers, as consequences can be severe *(30)*. Internationally, there is a responsibility upon institution foodservice operations, such as those in hospitals and long-term care facilities that serve food to at-risk populations, to implement either mandatory or voluntary food safety programs *(32)* such as Hazard Analysis Critical Control Point (HACCP) *(46)*.

Although food safety control measures are in place throughout the food supply chain, the final responsibility is that of the consumer in the domestic setting. Consequently, there is a need to minimize the risk of vulnerable consumers from consuming potentially unsafe food products in the domestic environment. Through all food handling steps, including shopping, transportation to the home, domestic storage, preparation, cooking and consumption in the home, consumers must implement risk-reducing food safety practices if they are to ensure food safety *(43)*. The domestic kitchen is a multi-factorial contributor to foodborne disease *(44)*. Cross-contamination, insufficient heat treatment of foods, inadequate refrigerated storage, inadequate hand decontamination practices, and improper cleaning of food contact surfaces are internationally recognized factors most commonly associated with foodborne disease *(20, 41)*. Consequently, there is a need for consumers to follow personal and domestic hygiene practices as well as practices related to separation of raw foods from ready-to-eat (RTE) produce, heat treatment, refrigeration temperatures, adherence to use-by dates and selection of safe food and drink *(47)*. To ensure this, consumers, including vulnerable individuals and their caregivers, need to be provided with tailored, appropriate food safety information and informed of food safety risks so that they can implement risk-reducing food safety practices *(37)*. Furthermore, for identified

vulnerable consumers, information specific to higher-risk foods to be avoided and lower-risk alternatives should be provided *(31)*.

The provision of food safety information for consumers

A need for targeted food safety information for particularly vulnerable consumers has been identified *(33)*, and provision of targeted food safety advice to these groups may reduce the impact of subsequent infections *(24)*. For example, appropriate food safety education for cancer patients may prevent further cases of foodborne infections *(39)*. However, a review of food-related patient information resources available in the UK *(17)* has established that many resources fail to highlight the importance of food safety for patients during chemotherapy treatment; substantial information gaps exist in food-related information sources, particularly in relation to listeriosis prevention practices. Overall, existing information has been determined to be inconsistent, with significant variations between resources *(17)*. There is a need for food safety education specifically intended for vulnerable patient groups, and consideration is required as to how and when this might be best placed. If vulnerable consumers could receive adequate food safety information from adequately trained, credible healthcare professionals such as dietitians, this could emphasize the importance of food safety.

Trusted sources of food safety information

Trust is an important factor to individuals receiving information on the basis of which they may change their attitudes or behaviors *(45)* and information provided by a credible source may be more likely to influence the public *(19)*. The professional's level of knowledge in itself does not lead to trust; trusted sources are instead seen to be characterized by positive attributes such as accountability *(21)*. A large European study found that the effectiveness of food safety information largely depended on the source and its perceived reliability *(34)*; trust in the information provider is an important factor for consumers in evaluating sources of food safety information *(34, 45)*.

In Europe and the U.S., consumers see healthcare professionals such as doctors and dietitians as the most trusted sources of food safety information *(42, 45)*. Several qualitative studies have found that consumers prefer healthcare providers such as dietitians as their information source for food safety information *(3, 26)*. Indeed, verbal communication from healthcare professionals, including dietitians, is a preferred method of food safety advice delivery by transplant patients *(13)* and such have been professionals mentioned frequently as credible sources of food safety advice to at-risk consumers such as those living with HIV *(26)*, individuals living with cancer *(36)* and people receiving chemotherapy treatment *(17)*.

What is a dietitian?

The title 'dietitian' is protected, meaning that dietitians are the only qualified healthcare professionals who are regulated by law to assess, diagnose and treat dietary and nutritional problems and are governed by an ethical code of conduct, and performance standards *(5, 8)*. In 2004, the International Confederation of Dietetic Associations (ICDA), in consultation with member associations representing dietetics around the world *(27)*, such as the Health and Care Professions Council (HCPC) in the UK and the Academy of Nutrition and Dietetics in the U.S., agreed upon an international definition for a dietitian: *"The dietitian applies the science of nutrition to the feeding and education of groups of people and individuals in health and disease. The scope of dietetic practice is such that dietitians may work in a variety of settings and have a variety of work functions" (4)*. Regulations for the title of dietitian mean that the dietetic practitioner accepts the obligation to promote high standards of professional practice and to protect the public and the profession by upholding them. This includes engaging with continuing professional educational requirements to maintain registration *(2, 19)*.

All registered dietitians (RDs) in the U.S. are also by default nutritionists, but it is important to note that not all nutritionists are RDs; additional training is required for this title *(9)*. In the UK and some other European countries, it is possible to train as either a nutritionist or a dietitian, but again, to obtain the title of dietitian a student must have been trained in an accredited program and shown competency in certain areas of clinical practice before qualifying, by completion of either clinical placements or an internship *(25)*. Internationally, it is accepted that dietitians will have received a minimum level of a bachelor's degree and a period of supervised professional practice of at least 500 hours that meet the international competency standards for dietitians *(27)*.

In the UK, the profession is regulated by the HCPC, which works with the UK professional body, the British Dietetic Association (BDA) to promote the profession, represent its members, develop curriculum frameworks, and deliver post-registration education, training and continuing professional development *(25)*. Membership to the BDA is open to anyone working in the areas of nutrition and dietetics, diet or food, including trained dietitians, researchers, educators and students *(6)*. Similarly, in the U.S., The American Dietetic Association (ADA) works together with the credentialing agency, the Commission on Dietetic Registration (CDR), to maintain appropriate curriculum frameworks, education and training *(14)*. In Sweden, the Dietisternas Riksförbund (the Swedish Association of Clinical Dietitians) works to protect the professional interests of members and ensures high standard of dietetic training and research *(16)*. It is difficult to quantify accurately the number of registered dietitians globally, but it is a growing profession. The ICDA states that

it represents over 200,000 Dietitians-Nutritionists worldwide *(28)*; there are currently 9,556 RDs in the UK *(25)*, in Sweden, there are 1,611 RDs *(16)*, and in the U.S., the ADA has 67,000 members, most of whom are RDs *(2)*.

What do dietitians do?

Dietitians are trained to become skilled at advising individuals to make diet-related behavior changes to improve their health and prevent disease. The ADA states that as members of a profession, dietitians are committed to helping the public achieve a healthy lifestyle, focusing on five critical health areas facing all Americans: Obesity and overweight, with special emphasis on children; healthy aging; having a safe, sustainable and nutritious food supply; nutrigenetics and nutrigenomics, integrative medicine, including supplements and alternative medicine *(2)*. Dietitians use the science of nutrition to devise eating plans for patients to treat medical conditions and promote good health by helping to facilitate positive changes in food choices *(25)*.

An important part of the dietetics curriculum recognized by both the BDA and the ACEND is that all graduates learn appropriate communication and behavior change skills, with the BDA stating that all trainee dietitians should graduate with critical, integrated and applied knowledge of communication and educational methods *(4)*. Such a curriculum ensures that dietitians not only are principal nutrition information providers but also have the skills needed to influence behavior change in patients and to educate and train groups of individuals, be these patient groups or other health professionals. Dietitians are reportedly trained to assess individuals with differing social and environmental influences and provide appropriate nutritional intervention. Diverse strategies are required for providing effective food safety information, because of the differing needs of groups of clients, each with its own social and environmental influences and food preparation practices *(11)*. In the complex area of behavior change, which can be influenced by a multitude of internal and external factors, dietitians have an important role in encouraging patients to change diet-related behavior *(13)*, which involves using effective communication skills and a variety of supportive approaches in order to empower people to improve their health.

Food safety in the dietetic curriculum

Given that food needs to be safe as well as nutritious to maximize food-related health and wellbeing, food safety is a necessary part of the curriculum designed for the training of RDs. The Accreditation Council for Education in Nutrition and Dietetics (ACEND) in the U.S. states that upon completion of a dietetic training program, graduates should be able to *"Describe safety principles related to food, personnel and consumers" (1)*. This specifically relates to food safety in foodservice, with the result that most of the food safety training for dietitians in the U.S., and in international programs that use the U.S. curriculum, has been focused on development of HACCP plans and managerial control of food safety in foodservice operations. In the UK, the Curriculum Framework for the pre-registration education and training of dietitians is set by the BDA to ensure that university nutrition and dietetics programs satisfy the HCPC Standards of Proficiency for Dietitians *(4)*. This framework states that graduate dietitians *"must have applied knowledge of food safety legislation and practice to manage and evaluate the service of safe food as well as a broad knowledge of structure and function of common microbes which cause infection and disease" (4)*; this has less emphasis on foodservice application, and prominence is given to legislation and microbiology instead. The way food safety is presented as part of dietetic training is essential; indeed, Medeiros and Buffer consider that associating food safety with medical nutrition therapy would encourage younger dietitians to address the topic with their patients *(35)*. The provision of food safety education alongside dietetic therapy, for example, rather than as lectures in microbiology, might provide more context for learning and fit with the holistic, patient-centered therapy that is being promoted as best care.

The inclusion of food safety in dietetic curriculum frameworks indicates awareness by international regulatory bodies that dietitians need to be able to provide correct food safety information. Too little research has been undertaken to determine how and when food safety education is provided during a dietitian's training, whether it is sufficient, and whether this training then enables dietitians to identify vulnerable individuals and confidently provide accurate food safety information and advice. Exploration of dietetic food safety training delivery is needed to determine whether clinically applicable skills are taught, as opposed to provision of scientific knowledge. Although clear curriculum requirements for the training of dietitians have been set by the relevant bodies, there is a need for an international comparison of dietetic-curriculum requirements; furthermore, little is currently known as to how institutions internationally choose to interpret and deliver such requirements. This is likely to mean that food safety training and education of dietitians may be variable, even when delivered by use of the same curriculum.

Professional development and continuing education of dietitians

Both the BDA and ADA recognize that the role of the dietitian is continually changing and recommend that the education and training of practitioners should prepare individuals for diversity of practice and ensure they can adapt to change in order to fill new and extended roles *(4)*. Given the ever-changing nature of the field, continuing education and professional development opportunities are essential for RDs. As all RDs have a commitment to

their ongoing education and may wish to increase their confidence by improving their knowledge, it may be necessary to consider updating their food safety training via continuing professional development/education courses. It is unclear if food safety-related professional development continuing education offerings are currently available to RDs. Specifically tailored courses could be effective in enabling RDs to identify at-risk patients and deliver targeted and relevant food safety information. The ADA states that dietitians should have a commitment to ongoing continuing education regarding food and water safety *(22)*, and both the ADA and the BDA require dietitians to continue their professional educations in order to maintain registration *(7)*. As indicated in *Fig. 1*, although there are opportunities for food safety education of dietetic students, training and education of RDs in practice is also important and must not be overlooked.

Opportunities for dietitians to provide food safety information

Because a key part of a dietitian's training and role is assessment of nutritional status of a patient, it follows that the role of the dietitian should include the provision of food safety advice to vulnerable patients *(1, 4)*. This would help ensure that a patient's dietary needs are being more widely considered, fitting with the movement toward a more patient-centered approach to healthcare and information provision *(12, 15)*. This approach encourages health professionals to work in a more holistic way, identifying individual patient needs, of which food safety education/behavior change may be one. Working as part of a wider multi-disciplinary team, dietitians also have the opportunity to indirectly inform consumers regarding food safety by training other health professionals and/or through development of resources. Although the dietitian is in a position to be able to provide effective food safety information and advice to appropriate patient groups, much more research is needed to establish their level of knowledge, attitudes toward safety, and how they identify vulnerable consumers and provide information. As illustrated in *Fig. 1*, there is a need to consider the potential routes by which dietitians may facilitate delivery of food safety information or use cascade training to communicate information about food safety risks and risk-reducing food safety practices so as to decrease the risk of foodborne illness among vulnerable patient populations.

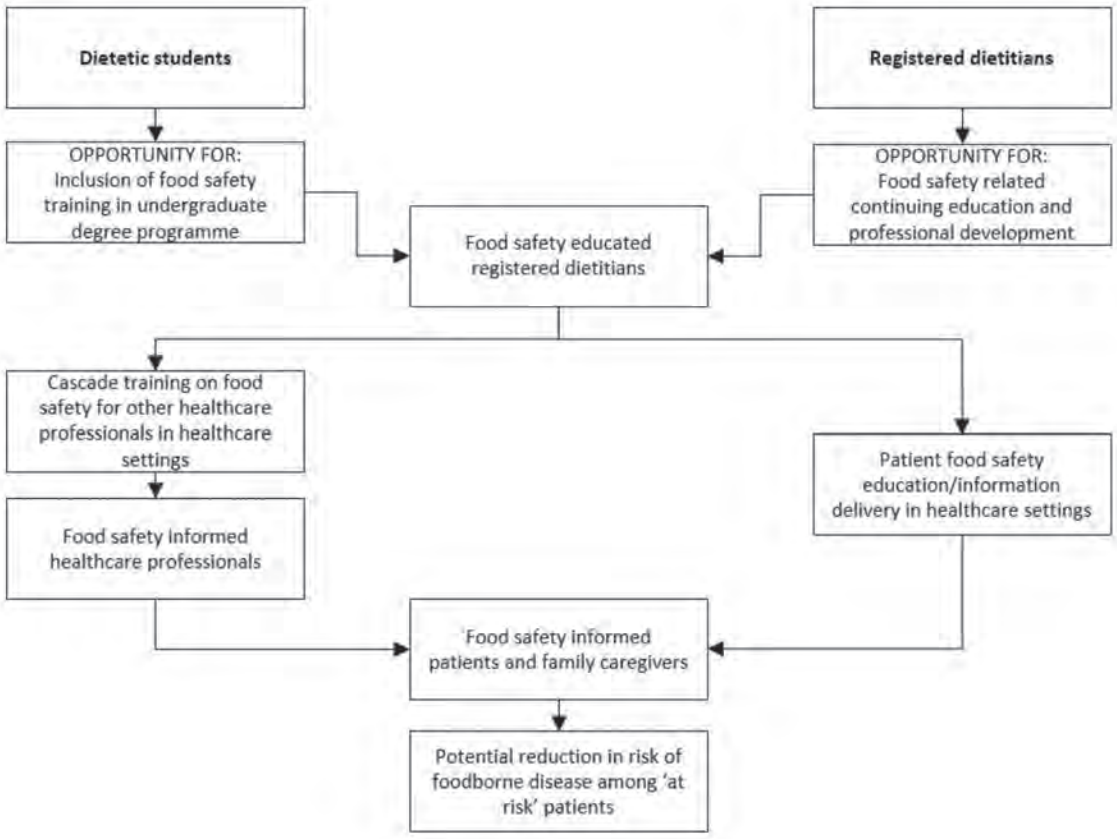

FIGURE 1. Opportunities to increase food safety awareness of dietitians and potential routes for delivering food safety information to at-risk consumers.

It is clear that dietitians are in a prime position to reach some of the most vulnerable consumers, either directly or indirectly, to have an impact on their risk reducing food practices during food handling, storage and consumption in and outside of the home. Despite this, a lack of adequate food safety knowledge among nutrition students and gaps in RDs knowledge *(35, 40)* have been identified, and RDs are only occasionally providing food safety advice to vulnerable consumers *(10, 12)*; dietitians are more likely to provide food safety advice when immune-compromised patients also have a medical condition that increases their risk of foodborne infections *(10)*. As only little evidence is currently available about RDs' beliefs and attitudes toward their role in providing education about safe food handling, it is not clear whether dietitians believe it is their role to provide food safety advice *(10)*. Further exploration of the potential barriers that may prevent RDs from providing food safety information and advice, and how confidence can be improved in this area, is required.

A symposium on teaching food safety to dietitians at the 2018 IAFP European Symposium on Food Safety identified a need for collaborative research on developing efficient methods for working with dietitians to facilitate the delivery of food safety information; the symposium resulted in an international network of like-minded academics who aspire to integrate effective food safety education into the dietetics curriculum and ensure appropriate professional development and continuing education courses to empower dietitians to inform and motivate patients so that they can implement food safety practices and reduce the risk of foodborne illness *(18)*.

CONCLUSIONS

Dietitians are well placed to be an important resource for food safety information and advice, whether directly or indirectly, for vulnerable populations. The delivery of clinically applicable food safety advice by adequately trained dietitians may increase awareness among vulnerable populations about their susceptibility to foodborne disease and enable them to implement risk-reducing food safety practices. Available research is scanty, but it indicates that (i) there are gaps in RDs' knowledge of food safety which necessitate further exploration, (ii) there is a lack of consensus about the interpretation of the dietetic curriculum requirements in institutions that deliver accredited dietetic training, (iii) there is a need to better understand trainee dietitians' food safety knowledge, training experiences and attitudes toward the delivery of food safety information; and (iv) there is a need to explore the availability of food safety-related continuing education courses for RDs. As a group of dietitians, microbiologists and food safety educators, we have identified an opportunity to work as an international network of dietetic food safety educators to strengthen this research area and explore the need to interpret the dietetic curriculum in a way that shifts the emphasis from dietitians having knowledge of food microbiology and food safety legislation to dietitians having clinically applicable skills to identify and deliver appropriate food safety advice and information to at-risk patients so as to increase their awareness of food safety risks and enable development of risk-reducing food safety practices.

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