Observational and microbiological analysis of older adult consumers' food handling practices in a model domestic kitchen

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Introduction

The home kitchen is important in relation to food safety, as data suggests the majority of food poisoning is not associated with outbreaks and may result from unsafe practices in the home [1,2].

Due to age-associated weakened immune function[3] older adults are more susceptible to foodborne disease than the general population[4], however food poisoning among older adults in Europe has increased by 50 – 80% over the last decade[5], the reasons for which are unknown.

Knowledge and self-report data suggest older adults lack awareness of food safety and may implementing unsafe practices; however, actual behaviour data is lacking[6].

Therefore, observation of older adults food safety practices is needed to determine the potential microbiological risk.

Aim

This study aims to determine food safety behaviours implemented by older adults using observation and compare observed food handling practices with actual microbiological contamination of the food preparation environment.

Methods

Adults aged over 60 years (n = 100) prepared a set meal (chicken and ham salad, selection of sandwiches) in a model kitchen equipped with ceiling mounted digital cameras.

Surfaces were cleaned according to a validated protocol[7] pre-food preparation session, and immediately swabbed post-food preparation to determine contamination (Aerobic Plate Count (APC) *Enterobacteriaceae* and *Staphylococcus aureus*).

Figure 1: model domestic kitchen ceiling mounted digital camera views

Findings

During food preparation sessions (n = 100) a total of 639 hand cleaning attempts such as before staring food preparation, after handling raw chicken or handling raw chicken packaging, were observed. Data presented in Figure 2 indicates malpractices implemented by older adults when washing/drying hands during food preparations and Figure 3 indicates the occasions which older adults failed to implement adequate hand washing/drying practices.

87% of hand cleaning attempts did not rub hands/fingers together

84% of hand cleaning attempts failed to use soap

61% of hand cleaning attempts did not use hot water

87% of older adults failed on one or more occasions to implement hand drying after washing

Figure 2. Hand washing / drying malpractices (n = 639)

70% before starting food preparation

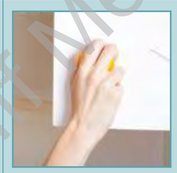
83% after handling / preparing raw chicken

93% after handling raw chicken packaging

84% before handling ready-to-eat food products

Figure 3. Occasions which older adults failed or inadequately implemented hand cleaning (n = 100)

79% tap handles



74% cupboard door handles

65% refrigerator door handle

52% chopping boards

Figure 4. Surfaces touched with inadequately cleaned hands after handling/preparing raw chicken (n = 100)

Inadequate hand washing and/or drying after handing foods such as raw chicken may result in contamination of surfaces subsequently touched. Figure 4 indicates the surfaces older adults most frequently touched with inadequately cleaned hands after handling/preparing raw chicken. Post food-preparation microbial analysis of such surfaces indicated that contamination with ACC < 6.32 $\log_{10}$ CFU, *Enterobacteriaceae* < 5.68 $\log_{10}$ CFU and *S. aureus* < 5.41 $\log_{10}$ CFU occurred as a result of older adults food handling practices.

Furthermore, during food preparation sessions (n = 100) 696 attempts to wash and dry food preparation equipment such as chopping boards and knives were observed. 82% chopping boards and 85% knives used to prepare ingredients during food preparation were inadequately washed and/or dried. Post food-preparation microbiological analysis of these surfaces resulted in contamination with ACC < 6.24 $\log_{10}$ CFU, *Enterobacteriaceae* < 4.26 $\log_{10}$ CFU *S. aureus* < 3.24 $\log_{10}$ CFU.

Conclusion

- Observational findings indicates that a considerable proportion of older adults implement unsafe food handling practices during food preparation.
- Microbial findings indicate older adults' do not implement sufficient washing/drying practices of food handling equipment and hands.
- Food handling malpractices have been compared to microbial contamination of kitchen surfaces and suggests that older adults food handling practices may impact on food safety
- Findings suggest a need for targeted risk communication and has implications for future consumer food safety education initiatives.

References

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