





Exploring Food Handler Perceptions and Attitudes Towards Hand Hygiene Before And During Production

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Introduction

Food handler hand hygiene and personal hygiene practices are often implicated in food outbreak investigations^{1,2}. Consequently, an appreciation of practical factors hindering and supporting hand hygiene as a fundamental food safety behaviour in food manufacturing and processing environments may be prudent to ensure continued consumer safety^{2,3}.

In prior research conducted in food service environments, work time pressures, availability of hand hygiene resources and management commitment to name a few^{4,5} are often implicated. However, as operational formalities in food manufacturing facilities are unique, an exploration of food handler hand hygiene perceptions and attitudes may prove invaluable to direct and develop bespoke interventions to enhance hand hygiene behaviours.

As such, the Global Food Safety Initiative's⁶ food safety culture framework provides a logical approach to analysing food handler attitudes towards hand hygiene. The guidance ensures that multiple aspects are taken into account in exploring not only knowledge, perceptions and attitudes but also in considering prevailing cultures thought to be influencing the same².

Purpose

The aim of this research was to explore food handler hand hygiene perceptions of, and attitudes towards, barriers and enablers (before and during production) to support bespoke intervention development in line with business needs.

Methods

Recruitment: Employees identified as food handlers working at three food manufacturing and processing sites participating in a larger hand hygiene study were invited to participate in a survey; 62 of which took part (response rate 77%).

Data Collection: A survey was created using a mixture of Likert scale (5 points; 1=Disagree to 5=Agree) and open-ended qualitative questions to capture food handler perceptions and attitudes towards food safety and hand hygiene awareness at their usual place of work.

Ethical Approval: Approval was obtained from the School of Sports and Health Sciences Ethics Panel at Cardiff Metropolitan University (Ref. PGR-3284).

Food handlers (*n*=62) from three food manufacturing and processing sites, were surveyed in December 2020.

Males accounted for the largest proportion of responses (77%) and the average age represented in the survey was 30-44 years (Table 1). Length of tenure ranged from 12 months to 15 years+.

Factors perceived as likely to

frequency included:

or too cold) (49%)

affect handwashing duration or

Water temperatures (too hot

Sore hands/skin as a result of

frequent handwashing (51%)

50% believed their hand hygiene

behaviours set a good example.

61% believed their hand hygiene

practices were excellent.

Table 1: Survey Participant Profile (n=62)

Gender	%	Length of Tenure (<i>Mean</i>)	Age (Average)	Site 1 %	Site 2 %	Site 3 %
Male*	77	48 months	30-44	39	18	13
Female	23	14 months	30-44	5	10	8

Food Handler Hand Hygiene Perceptions

male participants declined to indicate their usual place of work

Factors perceived as **unlikely** to affect handwashing duration or frequency included:

- Being late for work (80%)
- Working under pressure inside production (79%)
- Availability/accessibility of handwashing equipment (79%)
- The presence of others during handwashing procedures (63%)
- Management presence during production (50%)

Additional responses (qualitative; n=22)

indicating perceived handwashing barri-

ers included 68% of responders sug-

gesting there were none...



"I always wash my hands when I need it" Food operative 1, Site 3
"It is no trouble at all" Food operative 2, Site 1

...however, 8% noted hindering factors
included the working distance from hand
sink locations, paper towel availability (to
dry) and water temperature.

"...too far to go to the sink" Food
operative 1, Site 2
"Cold water" Food operative 2,
Site 1

Food Handler Hand Hygiene Attitudes

Results

Overall, general attitudes towards hand hygiene appeared positive, however, specific statements received less favourable responses with only 52% of food handlers certain that an adequate handwashing attempt should be executed for 20 seconds⁷ or more (Table 2). Nevertheless, when asked if additional hand hygiene training would be beneficial, only 5% of food handlers agreed.

Table 2: General and specific hand hygiene statement agreement (n=62)

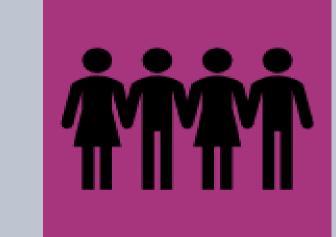
General Hand Hygiene Statements	Agree %
Hand hygiene is critical for food safety	86
Sanitiser must be applied to hands before entering production	95
Unwashed hands potentially spread contamination to food	95
Specific Hand Hygiene Statements	Agree %
20 seconds or more is an adequate handwashing duration	52
Hands must be washed, dried and sanitised before gloves are applied	63
Additional hand hygiene training (particularly inside production) would be beneficial	5

During the survey, participants were requested to provide examples of when hands should be washed and/or gloves changed (Table 3) as a reflection of hand hygiene knowledge. Participants (n=33) provided 48 qualitative examples including:

Table 3: Participant examples (*n*=48) of when handwashing/glove change required

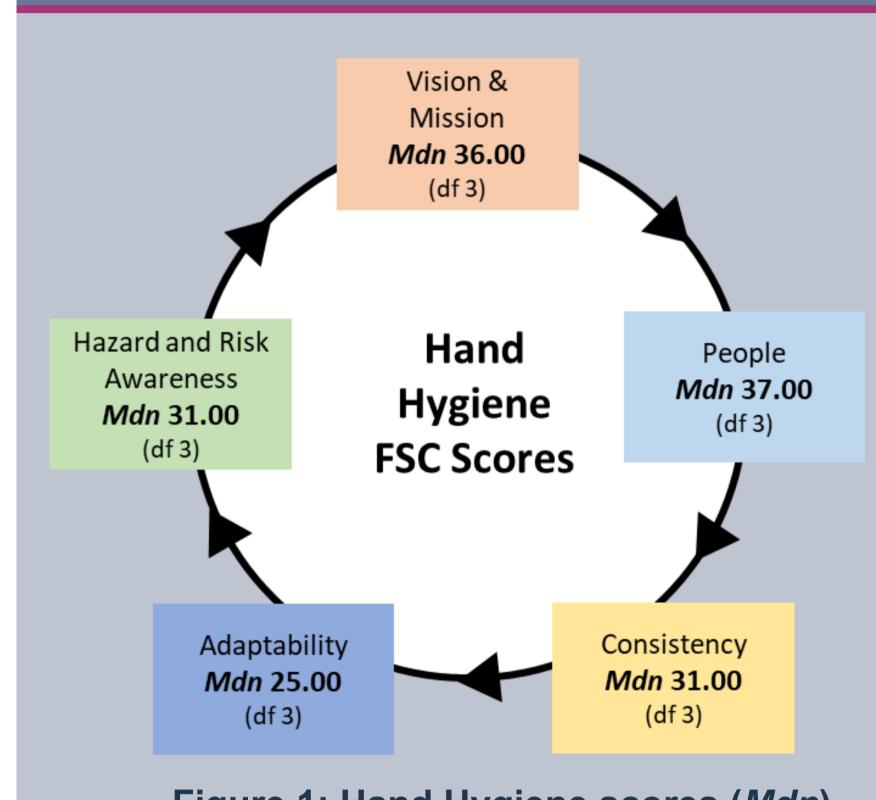
Mentioned

When should hands be washed and/or gloves changed?	(<i>n</i>)
Changing product	27
Production entry/exit (including after break)	4
When changing gloves (if damaged, torn, stretched, ripped etc.)	4
Touching the floor or picking items up from the floor	4
After handling equipment or machinery	3
When hands are dirty	2
Handling waste (or drains)	2
When required	2



Notably, changing product was the most frequently mentioned example (*n*=27) overall. This suggests that food handlers were more aware that hand hygiene was necessary during production than prior to production entry.

Hand Hygiene And Food Safety Culture



responses (*n*=44) were re -configured according to dimension with a maximum potential (positive) score of 45.00 for each; save for 'Hazard and Risk Awareness' with fewer statements and thus a total maximum score of 40.00.

Following the GFSI FSC

Framework⁶, survey

Figure 1: Hand Hygiene scores (*Mdn*) according to food safety culture dimension

An independent samples median (*Mdn*) test (Figure 1), suggests that 'People' responses (e.g. relating to knowledge/training) were more equally scored at *Mdn* 37.00, however, 'Adaptability' (e.g. relating to decision-making knowledge) was less consistent at *Mdn* 25.00.

By Site, responses varied (Table 4) with participants who chose not to reveal their place of work rating hand hygiene related 'People' aspects (Mdn 41.90) more favourably than 'Consistency' (Mdn 22.40).

Table 4: Median hand hygiene dimension scores by place of work (Site)

Hand Hygiene FSC Dimension	Site 1 (<i>n</i> =27) <i>Mdn</i>	Site 2 (<i>n</i> =17) <i>Mdn</i>	Site 3 (<i>n</i> =13) <i>Mdn</i>	Did not indicate workplace (n=5) Mdn
Vision & Mission	29.44	30.44	37.38	30.90
People	31.67	31.09	27.69	41.90
Consistency	32.11	31.32	33.96	22.40
Adaptability	26.69	37.53	31.62	36.70
Hazard & Risk Awareness	28.91	26.71	41.62	35.50
Combined	27.48	31.47	37.46	37.80

- Site 3 responded more favourably to 'Hazard & Risk Awareness' hand hygiene aspects (Mdn 41.62) suggesting that due to product risk category (e.g. high), training is potentially more effective and thus knowledge and awareness greater.
- Overall, Site 1 indicated the largest range of responses (*Mdn* 27.48), nevertheless, response scores for all Sites appear to range between "somewhat disagree" (Likert 2) to "somewhat agree" (Likert 4).
- A Kruskal-Wallis test determined no significant difference (p>0.05) between dimension responses by site.

Significance of study

- Attitudes and perceptions towards hand hygiene (as a food safety behaviour) appeared generally positive, with some variation in relation to food safety culture dimensions across Sites.
- Notably, Site 3 (with the highest product risk category) indicated more positive attitudes and perceptions of 'Hazard and Risk Awareness' aspects, while Site 2 indicated more favourable hand hygiene responses associated with the 'Adaptability' dimension (but not with 'Hazard and Risk Awareness').
- Contrary to prior research^{4,5}, for food manufacturing environments, attention to factors such as water temperature control and enhanced skin care support may be necessary to encourage individuals to adopt hand hygiene practices. Similarly, while confidence relating to hand hygiene execution (i.e. the intention) appeared high, self-belief (e.g. being a role-model) was mixed. Thus, more attention to 'People' aspects (as well as 'Vision and Mission') may be important when developing hand hygiene interventions bespoke to each Site.
- Surveys alone represent only one aspect of hand hygiene behaviours and a comparison of reported attitudes with behavioural observations is necessary to further explore and establish how prevailing food safety cultures at food manufacturing and processing sites influence hand hygiene behaviour in practice.

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