6FS010 PROJECT

Evaluating Barbershop Hygiene Practices in Telford and Wrekin: Implications for Public Health

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This independent project investigation was undertaken during level 6 of study and the total time allocated was 600 hours.

DECLARATION

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Signed: C James

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Abstract

This study evaluates barbershop hygiene in Telford and Wrekin, prompted by a local and national rise in tinea capitis infections. The lack of a statutory obligation to inspect barbershops means that practices in the UK remain largely unknown. Utilising a mixed-methods approach that incorporates inspection findings and adenosine triphosphate (ATP) testing to evaluate the efficacy of disinfection methods. Results highlighted significant deficiencies, with 62.1% failing to meet ATP cleanliness standards set by this study following the barber's usual disinfection method, falling to 4.5% after a demonstrated two-stage cleaning process, with a mean reduction of 82.3% relative light units (RLU) ($p=0.0025$). Less than half (43.6%) had a satisfactory handwashing policy, and gown hygiene was also inadequate (91.4% reusing gowns). Despite the majority of barbers having a satisfactory infectious disease policy for both employees and customers, 97% did not follow a two-stage clipper cleaning method, risking pathogen transmission as equipment would not be disinfected effectively after use. Proposed policy and informal measures include mandatory registration, with inspections to assess compliance and voluntary referrals by medical professionals, though implementation presents challenges due to funding limitations and regulatory reluctance.

Introduction

Barbershops are a key community setting for infection transmission given their close-contact nature, yet UK hygiene practices remain largely unexplored. Pathogens such as *Staphylococcus aureus* and *Trichophyton tonsurans,* the causative agent of tinea capitis (ringworm), thrive in these environments, particularly with popular 'fade' haircuts that increase skin-equipment contact (Fuller, Child & Higgins 2003; Enemuor, Atabo & Oguntibeju, 2012; Müller *et al*., 2020; Alharbi & Alhashim, 2021; Bascón et al., 2023). Recent British press reports highlight a rise in tinea capitis cases linked to barbershops (BBC, 2025), a trend mirrored in Telford and Wrekin, prompting this local authority study. The Hair and Barber Council chief executive attributes the increase to the rise of unscrupulous and 'illegal' barbers, often suspected of being fronts for money laundering by authorities (BBC, 2025). Others note an increase in low-cost, unqualified high street barbershops, prompting calls for more stringent regulatory oversight (BBC, 2024).

This research investigates barbershop hygiene practices in Telford and Wrekin, evaluating the compliance of practices with health and safety legislation, such as the *Control of Substances Hazardous to Health (COSHH) 2002*, and assessing disinfection efficacy using adenosine triphosphate (ATP) testing. By identifying infection risks and offering practical recommendations, this study aims to strengthen infection control measures, ensuring safer experiences for barbers and their customers.

Aim

To evaluate the hygiene practices of barbershops in Telford and Wrekin, identifying public health risks and providing recommendations for improved compliance and health outcomes.

Objectives

- Conduct inspections of barbershops in Telford and Wrekin to assess hygiene and safety practices
- Assess the effectiveness of the equipment disinfection/cleaning techniques used in barbershops, using Adenosine Triphosphate (ATP) testing as an indicator
- Provide guidance and demonstrate improvements in disinfection/cleaning techniques through reduced relative light unit (RLU) readings
- Identify potential public health risks and provide recommendations for improved compliance with health & safety legislation and health outcomes

Literature Review

Microbiological Hazards, Health Risks and Cultural Trends

Barbershops are ideal environments for pathogenic bacteria, fungi and viruses (Alharbi & Alhashim, 2021) due to the nature of the services provided (Stout et al., 2011). *Staphylococcus aureus*, a common bacterial pathogen in barbershops (Enemuor, Atabo & Oguntibeju, 2012), can colonise the skin and hair as commensal flora (Jape et al., 2003; Agi et al., 2023). *S. aureus* infections can appear as skin and soft tissue infections such as impetigo, folliculitis, furuncles, and carbuncles (Tong et al., 2015).

Whilst the bacteria colonises at least 30% of the population harmlessly (Kluytmans, van Belkum & Verbrugh, 1997; Cole *et al*., 2001; von Eiff *et al*., 2001), the emergence of Methicillin-Resistant *S. aureus* (MRSA) strain, has increased morbidity and mortality due to resistance to antimicrobials (Plano *et al*., 2011; Hassoun, Linden & Friedman, 2017). A study by Ruddy, Cummins & Drabu (2001), following a positive MRSA screening from a patient's hairline in a London hospital concluded that the hospital hairdresser was the infection source. An investigation

into the hairdresser's processes revealed that she did not decontaminate her equipment adequately after use. This was confirmed when EMRSA15, an epidemic strain found in the UK (O'Neill *et al*., 2001), was isolated from the gown and phage typed. Analysis of the patients visited by the hairdresser showed that 16.3% were colonised with MRSA during her visits. Although the MRSA prevalence acquired in nosocomial settings has been well researched, the rise of community-acquired MRSA (CA-MRSA) is poorly understood, and more research is required to understand the role of barbershops and hairdressing salons (Moore & Miller, 2007; Saïd-Salim, Mathema & Kreiswirth, 2015).

Tinea capitis, or ringworm of the scalp, is a contagious disease caused by dermatophyte fungi such as *Trichophyton tonsurans*, primarily affecting children aged 6 months to 12 years (Elewski, 2000; Hay, 2016), with boys more commonly affected (Mirmirani & Tucker, 2013). The infection can present as mild scaling, often caused by anthropophilic species such as *T. tonsurans* predominate in the United Kingdom, to severe inflammation with pustular legions leading to hair loss, often caused by zoophilic species such as *Microsporum canis*, a strain more prevalent in Mediterranean countries (Hay, 2000; Powell *et al*., 2022). A Spanish study by Bascón *et al*. (2023) investigating an emerging outbreak of tinea capitis affecting young males found that all cases had recently had a 'fade' haircut by their barber (Figure 1). The investigation concluded the infection occurred almost exclusively in the occipital and temporal areas, where the hair is most closely shaved and therefore has the greatest contact between the equipment and skin. A study in Germany by Müller *et al.* (2020) after 18 young male patients developed the infection after visiting barbershops, also found the infection primarily presented on the shaved areas of the scalp. The hairstyle reported in the Spanish study has long been fashionable in the UK, where a study by Fuller, Child & Higgins (2003) in

London correlated the isolation of dermatophytes from barber clippers with the prevalent use of the equipment to create the hairstyle. With 63% of cases having had their hair cut with clippers, the study indicates that barbers may have contributed to the spread of infection. Children may show scaling, hair loss, and positive fungal cultures, but asymptomatic cases, without the presence of the typical circular rash makes it hard for barbers to identify the infection, highlighting the need for thorough equipment disinfection.

While rare in older adults, a U.S. study by Takwale et al. (2001) linked two tinea capitis cases in elderly women to a shared hairdresser. As is the case with children, the elderly also have low fungistatic sebum (Vannini et al., 1986), which may predispose them to tinea capitis (Takwale et al., 2001).

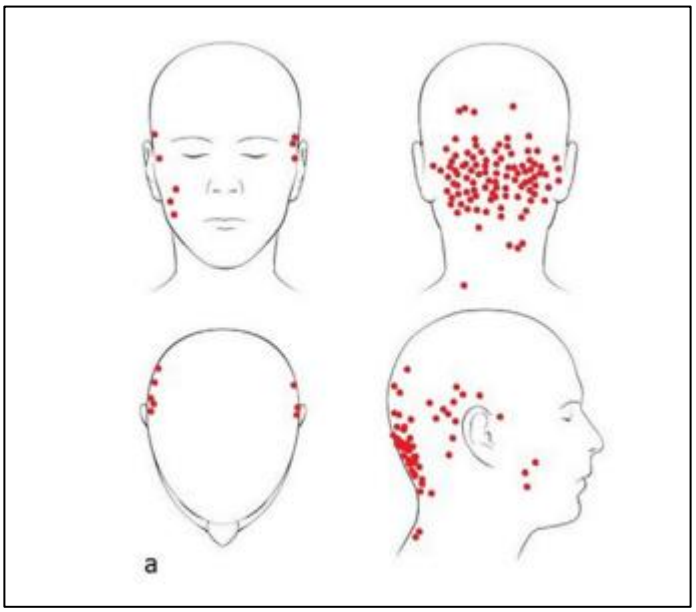

Figure 1 - Initial site of tinea capitis lesions recorded after an outbreak in Spain (Bascón et al., 2023)

Viruses such as hepatitis B (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV) remain persistent global health challenges (Coppola *et al*., 2016). As they are transmitted by blood (Alfadhli *et al*., 2024), barbering tools and skin lacerations are possible transmission routes for infection, especially high prevalence areas (Britsch, Bereswill & Heimesaat, 2024).

Legal Framework for Barbershops

The *Health and Safety at Work Act etc. 1974* provides the framework for workplace health and safety (Peate, 2023) legislation, including barbers. It holds those creating risks responsible for controlling them ‘so far as reasonably practicable (Reed *et al*., 2013; Robertson, 2015). The *Management of Health and Safety at Work Regulations 1999* extends the general duty laid out in the act by requiring employers to conduct risk assessments and identify control measures to protect anybody affected by the work activities (Gadd, Keeley & Balmforth, 2004). The employer must keep a written record if more than five people are employed (Appleby & Smail, 2012).

As well as mandating risk assessments for storing hazardous chemicals in workplaces (Morgan, Stewart & Bennett, 2020), *The Control of Substances Hazardous to Health Regulations 2002* (COSHH) also covers biological agents that can cause harm. Microbiological risk (e.g. HIV, fungal infection) must be addressed when conducting a general workplace risk assessment (Swan *et al*., 2002). Causative agents of ringworm, such as *Trichophyton* spp. are listed in the Health and Safety Executive’s (HSE) Approved List of Biological Agents requiring risk assessment. Worryingly, a study of UK hairdressers in a British city, Harris-Roberts *et al.* (2013) found that less than half (40%) understood COSHH assessments and could provide evidence that they have been carried out.

Where employees contract diseases from biological agents due to occupational exposure, it is reportable under Regulation 9 of *The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013* (RIDDOR) (HSE, 2024a). A biological agent defined in the COSHH regulations includes microorganisms that cause infection, meaning blood-borne viruses and fungal infections such as ringworm are reportable. However, employers may be discouraged from reporting

as it could result in an investigation and potential prosecution (Waclawski, 2013). Despite being a legal requirement, the reporting system suffers from chronic underreporting (Clay *et al*., 2020). Whilst the HSE does not estimate the underreporting levels of biological agents, non-fatal injury underreporting is estimated to be around 50% (HSE, 2024b).

Under *The Health and Safety (Enforcing Authority) Regulations 1998*, local authorities enforce health and safety legislation in barbershops. Many local authorities chose to enact byelaws under the *Public Health Act 1961*, mandating the cleanliness of premises, equipment and operatives (Southampton City Council, 1987; East Staffordshire Borough Council, 2024; Leeds City Council, 2024), but do not explicitly mandate equipment disinfection between customers. Other local authorities, such as Tameside Metropolitan Borough, have made byelaws under the *Local Government Miscellaneous Provisions Act 1982* that state that equipment must be sterilised once a day but cleaned between customers (Tameside Metropolitan Borough, 2024). Local acts such as *The Greater Manchester Act 1981* require barbers to register with their local authority, which triggers a health and safety inspection (Salford City Council, 2024).

These measures are not consistently implemented in England, with no national statutory registration or licensing requirement (HOC Library, 2023). The Hair Council, created by the *Hairdressers Registration Act 1964,* maintains a UK register of hairdressers and barbers, however, it is voluntary, and it is estimated that only 10% of those working in the industry are registered (Conway, 2022). Shears (2012) argues that due to the personal injury risk, mandatory registration is long overdue and that amending the 1964 act would allow for its easy implementation.

Hygienic Practices and Knowledge of Barbers

Barbers and their customers are exposed daily to pathogenic microorganisms, easily spread without appropriate infection control (Enemuor *et al.*, 2013). Though global studies have been published on hygiene practices in barbershops, there appears to be a lack of research investigating practices in the UK and European countries, despite the investigations into fungal transmission discussed previously. This gap in the literature presents a significant limitation to the current understanding of hygiene practices in UK barbershops, as regional differences in regulatory frameworks, cultural practices, and compliance levels will vary greatly.

Studies in low-middle income countries show limited knowledge of blood-borne viruses such as hepatitis B, C and HIV. Al-Rabeei *et al*. (2015) found 72.5% of Yemeni barbers were aware of hepatitis transmission via instruments, with 13% reusing razor blades. Mutocheluh and Kwarteng (2015) reported poor hepatitis awareness amongst Ghanaian barbers, though 97% recognised the HIV risk from shared blades.

Arulogun and Adesoro (2009) observed barbering practices in Nigeria, noting that whilst 84.1% were aware of HIV transmission risks, disinfection was improperly carried out in over half the inspections, with clippers not disinfected at all in 14 of the 90 observations. A study evaluating barber knowledge and practices in Saudi Arabia found that 122 (52.6%) used cologne or a flame to sterilise razor blades (Siddiqui *et al*., 2018). The previously discussed study in Germany by Müller *et al*. (2020) found that one barbershop sterilised hair utensils once per day, resulting in a discussion around the need for regular equipment disinfection and the signs of tinea capitis. Guidelines from the British Association of Dermatologists for the tinea capitis management note that fomites in barbershops are of particular concern, recommending a 2% aqueous solution of sodium hypochlorite containing 16.5% as

a suitable disinfectant (Fuller *et al.*, 2014). A study in the UK by Environmental Health Practitioners Harris-Roberts, Bowen & Sumner (2013), evaluating compliance with health and safety legislation in hair salons, found that equipment was effectively cleaned, disinfected and/or sterilised in 86.6% of cases. The vast majority of salons (99%) were found to provide hot running water, however, it does not state whether employees washed their hands between clients.

In infection control, it is a fundamental principle that cleaning must precede disinfection, as the presence of protein and other materials prevents the disinfectant from penetrating the equipment surface (Nyhsen *et al.,* 2017). A study published in the Journal of Hospital Infection by Chowdhury *et al*. (2019) found that soiled surfaces significantly reduced the disinfectants efficacy, with little to no reduction in viable bacterial load. This aligns with UK-specific guidance, including NHS England's National Standards of Healthcare Cleanliness 2025 and the HSE, which note that organic matter can readily deactivate some disinfectants, mandating debris removal before disinfection (HSE, 2025c; NHS, 2025). Industry practices reinforce this, with the National Hair & Beauty Federation recommending that tools should undergo visible cleaning and sterilisation, though they do not state that this should take place between customers (NHBF, 2024).

Adenosine Triphosphate Testing as a Hygiene Indicator

ATP is a molecule that serves as an energy carrier in cells of all living organisms, including animals, plants and microorganisms (Shama & Malik, 2013; Bakke, 2022). The ATP testing process uses the firefly luciferase reaction, where the enzyme luciferase converts luciferin and ATP into light (Shama & Malik, 2013; Ali *et al*., 2020; Mildenhall & Rankin, 2020). Light is measured using a luminometer, the device quickly displays the results as relative light units (RLU) which are

proportional to the amount of ATP in a sample (one photon is produced for one molecule of ATP consumed) (Linklater & Örmeci, 2013).

As the method detects organic debris and microbial contamination, it provides an immediate indication of surface cleanliness (Aycicek, Oguz & Karci, 2006). In similarity with my use of ATP to assess the methods used by barbers to disinfect their tools, the process is used in nosocomial settings to ensure compliance with the manual equipment cleaning such as flexible endoscopes and medical instruments (Alfa, Olson & Murray, 2015; Masia *et al*., 2021). Griffith *et al*. (2007) used the method to assess the effectiveness of modified cleaning regimes in a Welsh hospital and found that failure rates of 86-100% dropped to 0-14% as the results allowed rapid corrective action to be implemented.

ATP swabbing has an advantage over traditional culture methods, in that results are obtained quickly with complete results (Skovhus & Højris, 2018) as opposed to plating onto agar plates, which have to be incubated for 48 hours (Shama & Malik, 2013). ATP is particularly useful when carrying out inspections of personal service establishments such as barbers, as the effectiveness of adhering to appropriate cleaning procedures can be demonstrated by reduced RLU readings. However, if the identification of specific pathogens is required, environmental culture methods should be used (Alfa, Olson & Murray, 2015). As the test does not determine whether the ATP source is of microbial or organic origin (Bakke, 2022), bacterial and fungal contamination could be low (due to sufficient sterilization) whilst levels of organic matter is high due to insufficient cleaning (van Arkel, Willemsen & Kluytmans, 2021; Bakke, 2022). In contrast, a low RLU value does not necessarily mean low CFU (colony forming units) as luminometers require at least 10^2 to 10^4 CFU per sample to detect bacteria (Moore & Griffith, 2002; Gracias & McKillip,

2004; Turner *et al*., 2010). Therefore, low RLU surface readings do not necessarily indicate an absence of organisms such as MRSA (Alfa, Olson & Murray, 2015).

Methods

Overview

This study used a mixed-methods approach, integrating qualitative inspection findings and quantitative ATP testing, chosen for their ability to provide measurable cleanliness data, alongside the context of the hygiene practices found. This approach aligns with the study's aim to assess and improve infection control practices through practical interventions.

Following a local rise in ringworm cases and the absence of statutory inspections, the team responsible for health and safety and infection control at Telford and Wrekin Council initiated a project to visit all barbershops in the local authority area with a view to improving practices and decreasing the spread of infectious disease through education. At the beginning of the project, 39 barbershops were identified through internet searches and the local knowledge of the team.

Qualitative Data Gathering

A standard pro-forma was developed to record inspection findings relating to a range of hazards, covering handwashing and the facilities available to do so effectively, disinfection methods and storage of clippers and combs, gown hygiene and infectious disease policy. The qualitative data was thematically analysed to identify common hygiene deficiencies. Findings were converted into numerical values to enable analysis, necessary to quantify the level of compliance (e.g. percentage of barbers washing their hands between customers).

ATP Method

The ATP bioluminescence assay was performed using a Hygiena EnSURE V.2® luminometer and Hygiena UltraSnap™ containing the test enzyme solution (luciferin-luciferase). Clippers were swabbed pre and post-advice where practices and facilities allowed (e.g. suitable disinfectant on site), with barbers shown how to carry out an effective two-stage clean (where disinfectant was applied, debris wiped away until visibly clean, then disinfected). Clippers were swabbed for twenty seconds, following the manufacturer's advice on the pressure applied to the equipment and swab rotation. After sampling, each swab was placed into the UltraSnap™ tube and shaken for at least five seconds to mix the sample with the reagent solution, where luciferase converted luciferin and ATP to light (Shama & Malik, 2013; Ali *et al*., 2020; Mildenhall & Rankin, 2020). Swabs were then placed in the luminometer, which quickly displayed the results as RLU, proportional to the amount of ATP in the sample (Linklater & Örmeci, 2013). As ATP reduced post-advice, considerably in most cases, this approach was initially used as a visual aide in the hope that barbers would continue to adopt the two-stage cleaning process going forward.

Given the lack of ATP standards in the barbering industry, pass, caution and failure limits have been calculated in line with the luminometer manufacturer's guidance. The pass limit was calculated using the mean RLU score from the post-advice samples. The fail limit was calculated using $\mu + 3\sigma$. From a statistical perspective, this approach ensures that 99.7% of passing results will fall below the fail RLU limit. Any results exceeding this limit would be a statistical outlier, indicating potential contamination. The values between the pass and fail sit in the caution range, the use of which is typical when the equipment age is variable (Hygiena, 2014). An outlier result was excluded from the calculation (960 RLU, second highest result

269 RLU) as the equipment was heavily contaminated and required dismantling for a thorough clean.

Limits:

Pass: ≤89 RLU
Caution: 90-312 RLU
Fail: ≥313 RLU

Ethics

As a local authority environmental health-led project, the research was conducted under the legal powers granted by the *Health and Safety at Work etc. Act 1974,* thereby not requiring formal ethical approval. Data collected from the inspections has been anonymised to ensure barbershop confidentiality.

Results

ATP Results and Disinfection Method

Table 1 presents the interpreted ATP results of clippers taken pre-advice, following the barbers usual disinfection method and the results post-advice, following a two-stage clean demonstration as described in the methodology section. Prior to the intervention, 8.1% (n=3) passed ATP cleanliness standards, while 29.7% (n=11) fell within the caution range and 62.1% (n=23) failed. Following a two-stage cleaning process, the percentage of equipment passing increased significantly to 50% (n=11), while caution level results rose to 45.5% (although slightly lower in number, n=10). Most notably, the failure rate dropped from 62% to 4.5% (n=1). These results are displayed visually in Figure 2.

Table 1. Interpretative ATP results of barbering equipment		
Outcome	**Pre-advice (n=37)**	**Post two-stage clean (n=22)**
Pass	3 (8.1%)	11 (50%)
Caution	11 (29.7%)	10 (45.5%)
Fail	23 (62.1%)	1 (4.5%)

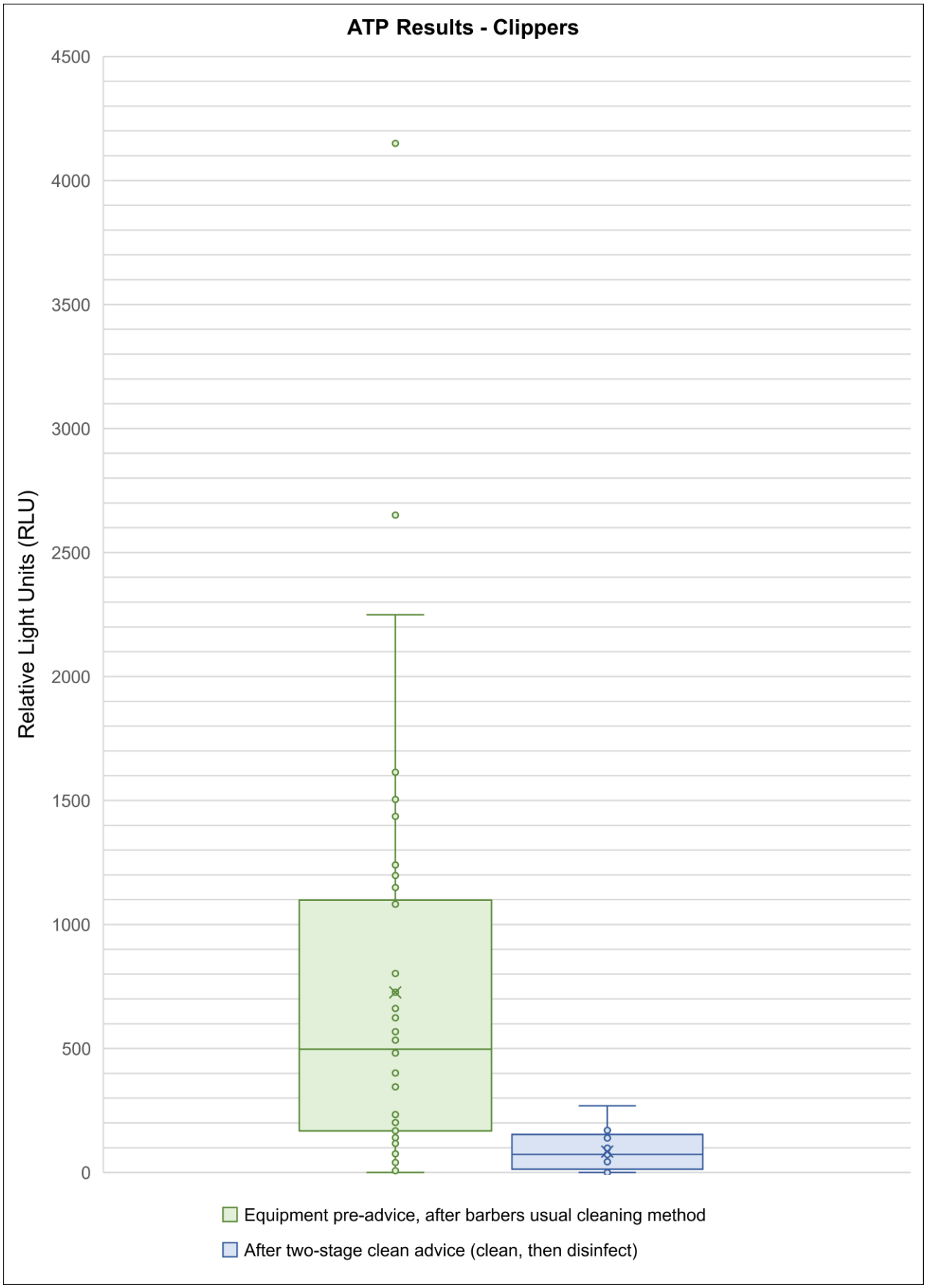

Figure 2 - ATP results pre and post-advice

Table 2 displays the method of cleaning/disinfecting that the barber usually carries out in between clients. Only one barber explained an effective two-stage cleaning method, with the majority (73%, n=27) brushing the hair off the clippers and then using a disinfectant. For those that were using an appropriate disinfectant, only two barbers (8.7%, n=2) were aware of the contact time for the product. 10.8% (n=4) were using an ineffective product (cologne) and 5.4% (n=2.7) were using a blade cleaner and/or maintenance oil but no disinfectant. One barber used a blade cleaner spray and disinfectant, but did not remove the debris and dry the equipment before applying the disinfectant and another made no attempt at cleaning or disinfection, despite being observed.

Table 2. Barbers usual method of cleaning/disinfecting between customers

n=37	**Following an effective two-stage cleaning method**	1 (2.7%)
	Brushing hair off equipment and using disinfectant	27 (73%)
	Brushing hair off equipment and using cologne	4 (10.8%)
	Brushing hair off equipment and using an anti-septic solution	1 (2.7%)
	Using blade cleaner/maintenance oil, but no disinfectant	2 (5.4%)
	Using blade cleaner and disinfectant, not physically removing debris	1 (2.7%)
	No attempt at cleaning or disinfection	1 (2.7%)
n=23	**Aware of contact time** (for those using a disinfectant)	2 (8.7%)
n=36	**Equipment stored to prevent contamination**	31 (86.1%)
n=37	**Equipment shared between barbers**	2 (5.4%)

For the results that can be paired (a pre and post-advice result from the same barbershop), there was an 82.3 % average reduction in RLU. Individual results for each barbershop are displayed in figure 3 below.

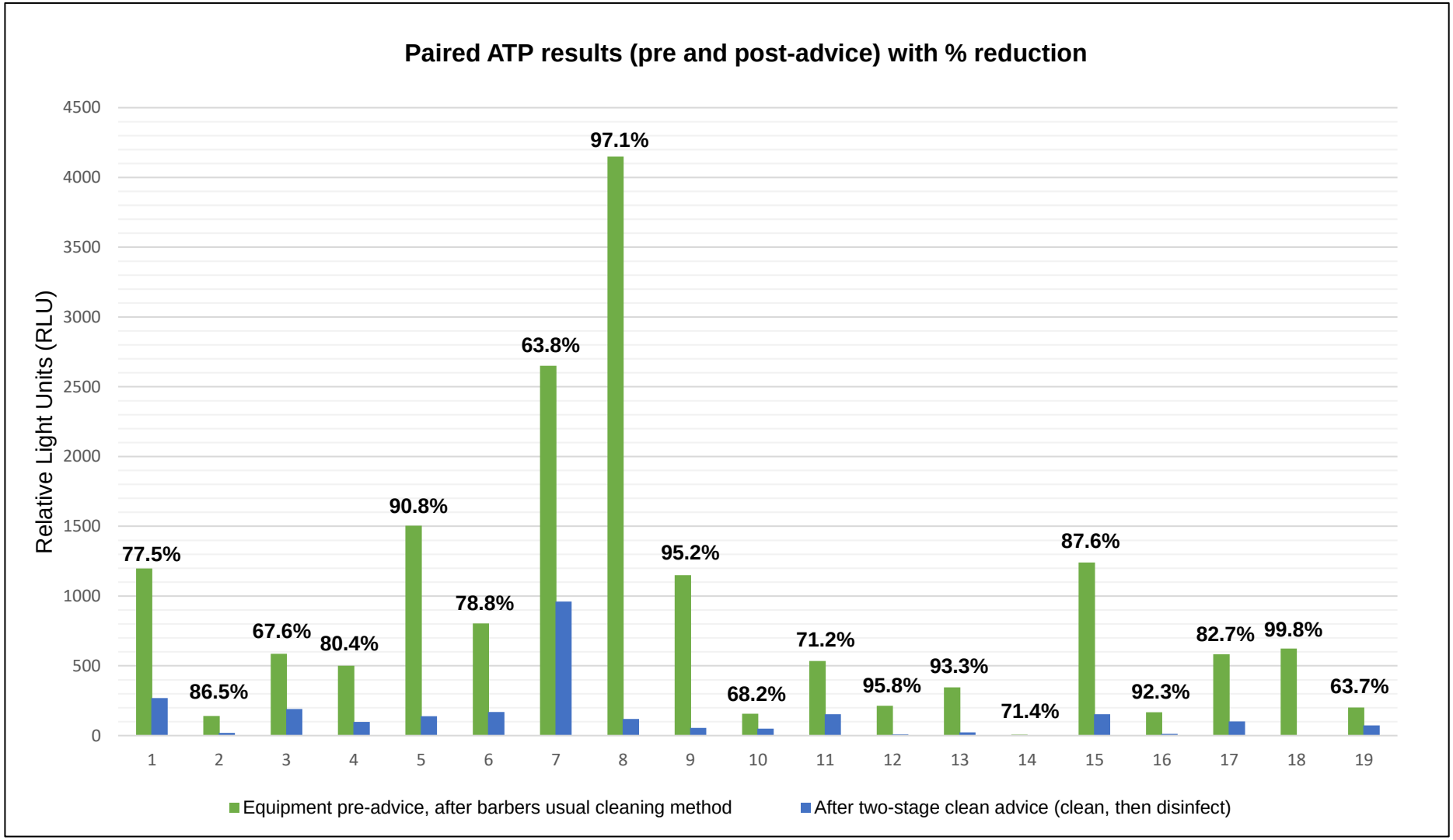

Figure 3 – Paired ATP results (pre and post-advice) with percentage reduction

For the barbershops using Barbercide® solution to disinfect non-electrical tools, the ATP results of combs swabbed after being taken out of the solution (n=20) are displayed in Figure 4 below. The mean level of ATP found is 30.9 RLU (SD=34.07). This study has not calculated a pass/caution/fail criteria for this equipment and disinfection type as we do not have the data to calculate a desirable standard, however, all but one result (136 RLU) are below the pass limit calculated for clippers that have undergone manual disinfection. Of the 16 barbers asked how often they change their Barbicide® solution, it was changed on average every 5 days (SD=4.4). The midpoint was calculated to estimate a single value for responses given as ranges, e.g. 1-7 days. 60% (n=9) of the 15 barbers asked stated that they make up the solution to the dilution stated in the manufacturer's instructions (2 ounces Barbicide® in 32 ounces water). Two further barbershops were using an antiseptic solution designed for wounds (6 and 1 RLU). Another used a Barbercide® alternative, and returned a result of 624 RLU.

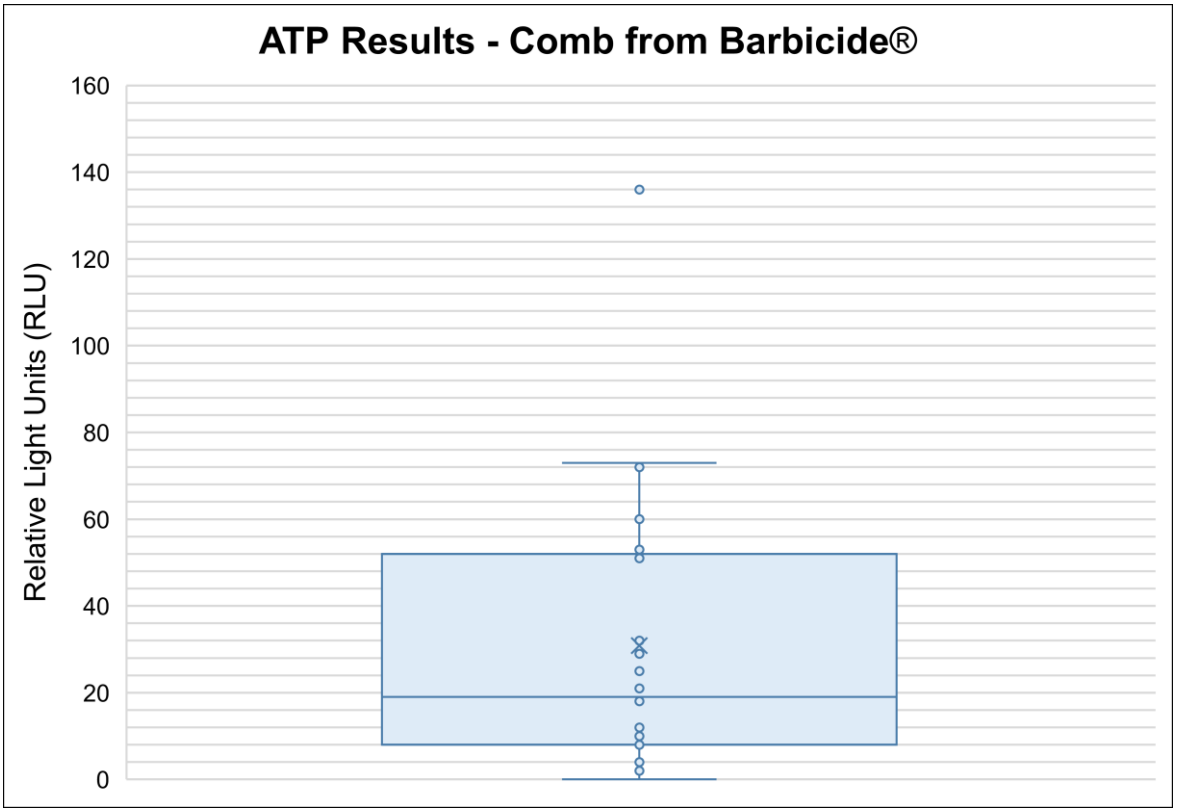

Figure 4 – ATP results of combs taken out of Barbicide®

Infection Prevention Practices

Handwashing

As shown in Table 3, 82.1% (n=32) of barbershops had hot water available for handwashing (a further 10% did not have their boiler switched on), 76.9% (n=30) had an appropriate soap and 89.7% (n=35) had a hygienic hand drying method. When asked if they wash their hands between customers, 61.5% (n=24) said that they do, however, seven did not have one or more: hot water, soap or hygienic drying facility. With this taken into account, less than half (43.6%) wash their hands effectively between customers.

Table 3. Handwashing data

	Hot water available	**Soap available**	**Hygienic hand drying facility**	**Wash hands between customers**
n=39	*32 (82.1%)	30 (76.9%)	35 (89.7%)	*24 (61.5%)
	**an additional 4 barbershops (10.3%) have hot water available but the boiler was not switched on*			**7/24 claim to wash hands between customers, but do not have one or more of the following: hot water, soap, drying facility. With this taken into account: 17 (43.6%)*

Gown Hygiene

Table 4 shows that only 8.6% (n=3) swapped out their gowns between customers. 40.7% (n=11) stated that they wash their gowns daily. 22.2% (n=6) stated they wash their gowns every two-three days. 7.4% (n=2) explained that they wash their gowns twice a week and 29.6% (n=8) stated weekly.

Table 4. Gown Hygiene					
	Washing frequency (n=27)				
Gowns swapped out between customers (n=35)	**Daily**	**Every two days**	**Every two-three days**	**Twice weekly**	**Weekly**
3 (8.6%)	11 (40.7%)	5 (18.5%)	1 (3.7%)	2 (7.4%)	8 (29.6%)

Infectious Disease Policy

When asked what their policy would be if they noticed potential infectious disease (e.g. ringworm, impetigo) on a customer's scalp, the majority of barbers (84%, n=31) had a satisfactory policy as summarised in Table 5. They would not cut the hair, or if symptoms are seen after the cut had commenced, they would stop cutting or finish to a suitable standard. Some stated they would advise their customer to visit their GP. 16% (n=6) had an unsatisfactory policy, where they would cut hair wearing gloves. Others did not have a policy and stated they did not know common infectious disease symptoms. Some stated they would not cut or stop if already started and disinfect equipment; however, they did not have a disinfectant on site.

Table 5. Customer Infectious Disease Policy		
Category	**Response examples**	**Number of Barbershops (n=37)**
Satisfactory Policy	*Check skin before cutting, would not cut if infection spotted. Stop cutting if spotted - disinfect all equipment used*	**30 (81.1%)**
	Stop cutting/wouldn't cut + disinfect all equipment used	
	Stop cutting/wouldn't cut + disinfect all equipment used + recommend visit to GP	
	Finish to a suitable standard if already started, disinfect all equipment. If not started, advise can't cut. Client database held to send warning out.	
	Would not cut and advise to go to GP	

	Would not cut, dismantle equipment + disinfect	
Unsatisfactory Policy	*No policy – did not know the signs of infectious diseases*	**7 (18.9%)**
	Stop cut/would not cut	
	Stop cutting/wouldn't cut - disinfect all equipment - no disinfectant on the premises	
	Would cut hair wearing gloves	
	No policy - never see any signs	
	Make customer aware but still cut hair - wear gloves and disinfect equipment after cut	

Similarly, when asked their policy if themselves or their employees displayed signs of infectious disease the majority of barbers (76.7%, n=23) had a satisfactory policy, stating they would not work, as summarised in Table 6. 23.3% (n=7) had an unsatisfactory policy, where they continue to work wearing gloves, or go to their GP but continue to work.

Table 6. Employee Infectious Disease Policy

Category	Response Examples	Number of Barbershops (n=30)
Satisfactory Policy	*Wouldn't work*	**23 (76.7%)**
	Wouldn't work until resolved	
	Go to GP - wouldn't work until resolved	
Unsatisfactory/Unclear Policy	*Wear gloves and continue to work*	**7 (23.3%)**
	No policy	
	Go to GP	
	Go to GP - continue to work	
	Go home	

Discussion

Overview

This study aimed to evaluate the hygiene practices of barbershops in Telford and Wrekin, assessing factors such as handwashing, gown washing, infectious disease policies and the efficacy of disinfection techniques. ATP testing was used to quantitatively assess disinfection technique, following the barber's usual method and post-advice. Additionally, the study aimed to formulate recommendations to ensure future compliance with legislation and promote improved health outcomes for barbershop customers and employees. The findings reveal variable and poor hygiene practices, with notable deficiencies in the cleaning and disinfecting of equipment, handwashing and gown hygiene. Conversely, the majority of barbers were found to have an adequate infectious disease policy for customers, themselves and other employees.

Effectiveness of Clipper Disinfection Methods

In barbershops, the effective disinfection of fomites such as clippers and clipper guards between customers is essential in preventing the spread of infectious disease, especially those that cut the hair most closely to the skin and have previously been implicated in the spread of tinea capitis (Fuller, Child & Higgins 2003; Müller *et al*., 2020; Bascón *et al*., 2023). It is therefore concerning that only one barber followed a two-stage approach to clipper disinfection, as promoted by national bodies such as the NHS and HSE (HSE, 2025c; NHS, 2025) and industry guidance (NHBF, 2024). The majority of barbers (73%, n=27), brush hair off the clippers and then apply a disinfectant; however, residual hair and other debris such as hair products often remain on the equipment, potentially diminishing the efficacy of the disinfectant as it is unable to effectively penetrate the surface (Nyhsen *et al.,* 2017; Chowdhury *et al*., 2019). This is a particular issue for 'foil shavers', which are

highest risk for infections as they cut the hair most closely to the skin. This equipment type draws hair into the equipment as it is shaved and should be dismantled for hair to be removed before disinfection. The most common product found during inspections, Clippercide®, directs barbers to first thoroughly clean clipper blades to remove organic soil and then keep the surface moist for ten minutes. However, for those that did use a disinfectant, only 8.7% (n=2) of barbers were aware of the contact time of the product, which is critical in achieving log reduction of bacteria, fungi and viruses known to thrive in barbershops (Alharbi & Alhashim, 2021). Many reported that this is difficult to adhere to in a busy environment with customers waiting for their haircut. This is particularly concerning where infectious customers are asymptomatic, i.e. in the case of tinea capitis, where cases do not always present with a typical circular-like rash that barbers can identify (Fuller, Child & Higgins, 2003).

Four barbers (10.8%) were found to be using cologne to 'disinfect' their clippers, a practice prevalent in other regions of the world, such as Saudi Arabia, where the previously discussed study found 52.6% of barbers were using cologne or a flame to 'sterilise' (Siddiqui *et al*., 2018). Some barbers in Telford and Wrekin may be familiar with this practice due to its traditional use in regions where they have ties and where cologne is perceived as a hygienic disinfection method. However, cologne lacks the antimicrobial properties required to reduce pathogens to a safe level. Although cologne with a high enough alcohol content could theoretically have some disinfectant effect, most formulations do not contain the typical 60-70% content recommended by organisations such as the World Health Organisation (WHO, 2016) and are diluted with water and fragrances.

The majority of barbers (86.1%, n=31) were found to store their equipment appropriately to prevent recontamination, however, most are not effectively

disinfecting their equipment before storing, limiting the impact of this practice. Positively, only two barbers (5.4%) stated that equipment is shared between barbers, making them individually accountable for disinfection protocols and enhancing traceability in the event of potential infectious disease cases and outbreaks.

ATP Analysis

The ATP results underscore the inadequate disinfection practices found. Pre-advice, where clippers were swabbed following the barber's usual disinfection method, only 8.1% (n=3) passed (<89 RLU), 29.7% fell in the caution zone (90-312 RLU) and 62.1% failed (>313 RLU). Post-advice, following a demonstrated two-stage cleaning process, 50% (n=11) passed and failures dropped to 5% (n=1). The failure post-advice (960 RLU) is an outlier, with all other results between 0-269 RLU. This elevated result may be attributed to residual organic matter even after the two-stage clean, as the clippers were initially heavily contaminated with hair, and is paired with the second-highest pre-advice result of 2651 RLU. The proportion of the results in the caution zone increased from 30% (n=11) to 45% (n=10) despite a lower raw count, this must be interpreted cautiously due to the decline in total samples from 37 pre-advice to 23 post-advice. The number of results falling into the caution zone may be explained by the absence of regular and thorough cleaning (73% brushing hair off the clippers as opposed to wiping to remove all debris), meaning organic matter, sebum and hair products have been allowed to build up, which can elevate ATP readings (Bakke, 2022). Dismantling equipment to enable thorough cleaning, followed by disinfection and cleaning between customers would likely further reduce ATP levels.

As expected, no barbers were found to be using traditional reusable blades to practice cutthroat shaving as this is an outdated practice. However, only 16% of

barbers using single-use razor blades (n=25) had an appropriate waste contract as required under the *Environmental Protection Act 1990* and associated duty of care regulations, resulting in notices being served in some cases.

The adoption of a two-stage cleaning protocol, aligned with NHS, HSE (HSE, 2025c; NHS, 2025) and industry guidance (NHBF, 2024) and the literature (Nyhsen *et al.,* 2017; Chowdhury *et al*., 2019) resulted in a significant reduction in ATP levels. For the 19 results that are paired, there was an average reduction of 82.3% (SD=12.02%). A paired t-test conducted on the data confirmed the statistical significance of the improvement, with a mean RLU reduction of 745 RLU (SD = 923.5), and a 95% confidence interval of -1190 to -299.9 (t=3.516, df=18, p=0.0025, two-tailed). The p-value of 0.0025 indicates a highly significant difference ($p<0.01$), suggesting that the reduction in ATP level is unlikely due to random chance. Post-advice, the manufacturer's instructions for pre-cleaning and contact time was adhered to, which should have achieved disinfection log reduction. However, as noted by Bakke (2022) and Alfa, Olson & Murray (2015), ATP cannot differentiate microbial from organic sources, and microbial culturing is required to confirm reductions.

Barbicide® Disinfection Efficacy

Only 3 out of the 15 barbers change their Barbercide® solution daily as per the manufacturer's instructions (mean = 5 days, SD = 4.4). Additionally, just over half of the barbers asked (60%, n=9) prepare the solution to the recommended dilution. Despite this, the average ATP was 30.9 RLU (SD=34.07), lower than the results post-advice for the clippers. This may be attributed to the combs being fully immersed in the solution and reduced reliance on manual disinfection.

No clear correlation was observed between the frequency of solution changes and contamination levels. For instance, two barbers who change their solution every 14 days returned levels of 53 and 72 RLU, while others who change their solution daily or every three days reported levels of 73 and 136 RLU respectively. Similarly, there does not appear to be a correlation with those using the correct dilution, with those that stated they do adhere to the dilution having higher than those who do not (73 vs. 0 RLU). It should be noted that the findings are based on a small sample size, compared with clipper data and relies on the accuracy of the answers provided.

Hygienic Practices

Handwashing

In line with the findings of Harris-Roberts *et al*. (2013), who reported that 99% of hair salons in their study of a British city had hot running water, the majority (82.1%, n=32) also did in this study, along with soap (76.9%, n=30) and a hygienic hand drying facility (89.7%, n=35). 61.5% (n=24) claim to wash their hands between customers. However, when it is considered that 29% (n=7) lack one or more of the following: hot water, soap, or drying facility, fewer than half (44%, n=17) could do so effectively.

Gown Hygiene

Gown hygiene presented additional risks: only 8.6% gave each customer a fresh gown and the majority washing them daily (40.7%, n=11). Others wash them at least twice a week (29.6%, n=8) or weekly (29.6%, n=8). Although the biggest risk identified in the literature for tinea capitis infection appears to be the use of clippers that cut the hair most closely to the scalp, reused gowns could act as fomites, akin to the MRSA-contaminated gown identified in the study by Ruddy *et al*. (2001).

Infectious Disease Policy

When asked about their policy upon identification of an infectious disease on a customer's scalp, 81.1% (n=30) of barbershops had a satisfactory policy, such as refusing haircuts and giving advice to visit a medical professional, or ceasing cutting upon identifying a potential infection, followed by disinfection. This contrasts with 18.9% (n=9) lacking awareness or the products for equipment disinfection. Whilst it is positive that the majority of barbers had an adequate policy towards infectious disease, if infection is identified after the haircut has begun and effective disinfection of equipment is not undertaken (as observed in 97% of the barbershops in this study), this could lead to pathogen transmission. In similar proportions, the majority (76.7%, n=23) had a satisfactory employee infectious disease policy (would not work until resolved, seek advice from their GP), compared with 23.3% (n=7) with unsatisfactory or clear policies (e.g. continuing to work wearing gloves, no policy). For those with unsatisfactory or unclear policies, it is evident that they have failed to address the risks posed, neglecting their obligations under the *COSHH 2002* and *Management of Health and Safety at Work Regulations 1999* to conduct assessments to control microbiological hazards.

Study Limitations

Research Origins

As the research began as a project following a rise of ringworm cases in the area, it initially adopted an educative rather than academic approach, leading to several limitations. At the beginning, there were instances were barbers were not asked all questions, owing to busy environments during inspections, resulting in smaller sample sizes for some themes. ATP initially served as a visual aide to highlight poor cleaning techniques to the barber and the sample was not always repeated following

the two-stage cleaning demonstration. This has resulted in a smaller sample size for paired data (pre and post-advice results); a larger sample size would enhance statistical reliability. The absence of socio-economic data, a consequence of the project's practical origins, has restricted the contextual analysis of the findings. Additionally, the initial non-academic design meant questions were not always asked in a uniform manner, with leading questions asked in some instances. For example, a barber may have been asked, "Do you wash your hands in between customers?" rather than "How often do you wash your hands?". This phrasing may have encouraged acquiescence bias, where participants tend to agree with the implied suggestion of the researcher (Costello and Roodenburg, 2015).

ATP Testing

Without industry-standard pass/fail thresholds for ATP testing, further studies are required to confirm their suitability. Additionally, ATP testing cannot distinguish between organic matter and microbial contamination, limiting specificity (Bakke, 2022). In the case of ringworm, the lack of fungal laboratory testing accessible to the local authority meant that specific identification of fungal pathogens could not be conducted, restricting the study's ability to assess the prevalence of dermatophyte-related conditions in barbershops.

Recommendations

To strengthen barbershop hygiene standards, as argued by Shears (2012), the obvious step would be to introduce national mandatory registration by amending the *Hairdressers Registration Act 1964*, currently a voluntary framework. As is the case locally with *The Greater Manchester Act 1981,* and in a similar way to practitioners are required to register with local authorities nationally under the *Local Government (Miscellaneous Provisions) Act 1982* to practice procedures such as tattooing, this

would prompt an inspection to ensure compliance with health and safety legislation and local byelaws. *The Byelaws (Alternative Procedure) (England) Regulations 2016* have introduced a simplified process for the creation of local laws and could dictate practices such as disinfection method, ensuring a two-stage approach, disinfection type (antibacterial, virucidal and fungicidal), handwashing, infectious disease exclusion policy and training.

These measures seek to standardise hygiene practices and reduce transmission risks; however, the government has dismissed new regulations amid rising ringworm infections (BBC, 2024). An 18% reduction in local authority budgets in real terms by 2024-25, compared to 2010-11, along with increased pressures in other service areas (e.g., adult social care) (Jeffery, 2025), renders additional statutory demands challenging. Previous directives to cut 'red tape' further stimulated reductions in environmental health teams (Plume, Page & Garelick, 2018), resulting in a 32.33% reduction in the number of posts deleted between 2009 and 2018 (Unison, 2019), thereby diminishing capacity to undertake additional inspections.

Upon enquiry, the UK Health Security Agency (UKHSA) confirmed they lack a central record of ringworm and blood-borne virus cases and outbreaks associated with barbershops, highlighting the need for improved surveillance of barber-acquired infections. *The Health Protection (Notification) Regulations 2010* require GPs and laboratories to report diseases to UKHSA. However, classifying infections such as ringworm as a notifiable disease is not proportionate, as it is less severe than higher-consequence diseases and the resource constraints previously discussed limit feasibility. Currently reliant on complaints from cases, the ability of local authorities to trace the source of infection in the community could be enhanced by voluntary reporting agreements between local pharmacies (where cases are likely to visit for treatment) and GPs, and local authorities.

Conclusion

This study revealed significant hygiene deficiencies in Telford and Wrekin barbershops, posing public health risks amid a local and national rise in ringworm cases. Barbercide® solution appears to be effective in reducing ATP, with low RLU readings of immersed combs, even when infrequently changed and to an incorrect dilution. However, the biggest risk in the literature, especially with tinea capitis infection associated with fade haircuts, is the clippers that cut the hair most closely to the skin (Fuller, Child & Higgins, 2003; Müller et al., 2020; Bascón et al., 2023). Barbershop inspections showed that 62.1% of clippers swabbed failed the ATP cleanliness threshold ($\leq$313 RLU) set by this study following their usual disinfection method, with 29.7% in the caution zone and only 8.1% passing. This reflects the inadequate cleaning and disinfection techniques found; 97% did not follow a two-stage approach. Most (73%) brushed hair off the equipment, then used disinfectant, leaving residual hair and other residues, potentially diminishing disinfectant efficacy (Nyhsen et al., 2017; Chowdhury et al., 2019). Furthermore, only 9% of those using a disinfectant adhered to the contact time stated by the manufacturer, reducing its ability to reduce pathogens to a safe level. A two-stage cleaning intervention reduced RLU reading by 82.3% ($p=0.0025$), boosting pass rates to 50%, with only one failure, an outlier of 920 RLU.

Other hygiene practices showed 43.6% of barbers wash their hands between clients, and 91.4% did not provide a fresh gown to each customer. Although the majority of barbers had a satisfactory exclusion policy for customers showing signs of infectious disease, if a haircut has already begun, findings have shown many lack the expertise and/or disinfectant to decontaminate equipment, greatly increasing transmission risks.

This study has suggested potential legislative and informal options to improve public health outcomes, such as mandatory registration with inspections to assess compliance and voluntary referral by pharmacies. However, policy changes are hindered by the lack of appetite for the regulation of the sector (BBC, 2024) and a reduction in local authority funding (Jeffery, 2025), which has led to a 52.9% reduction per head of the population in environmental health budgets (Unison, 2019).

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