

INTRODUCTION

- Deliberate self-harm (DSH) injuries are increasing
- Self-inflicted burns (SIB) are under-researched, with previous work focused on larger self-immolation injuries
- Subjective increase in self-inflicted cold burns observed by burns service without data to substantiate this

Deliberate self-harm (DSH) injuries are common, with an estimated 14 million episodes annually or 60 per 100,000¹, with an estimated lifetime prevalence of 13.7% in children and adolescents². In the UK, prevalence appears to be increasing over time, nearly tripling from 2000 to 2014³. The greatest prevalence has been observed in young female patients aged 16-24, nearly a fifth of which (19.7%) reported engaging in DSH³.

Self-inflicted burn (SIB) injuries, however, are less well-researched, with previous UK work focusing mainly on larger self-immolation injuries^{4,5}. These papers demonstrated a tendency of SIB to be of large TBSA, caused by flame and more common in male patients with a documented mental health background.

An emerging phenomenon, however, is the increasing description of self-inflicted cold burns, predominantly through the sustained application of aerosol sprays⁶. Repeated self-injury in this manner has been observed to be more common amongst younger, female, Caucasian patients⁷.

OBJECTIVES

- To characterise patient demographics, self-inflicted burn injury patterns and factors influencing recurrence
- Substantiate subjective observation of increasing presentation of self-inflicted cold injuries in recent years

METHODS

Retrospective review of online referrals to the regional burn units at Wythenshawe Hospital and Royal Manchester Children's Hospital (Manchester University Hospitals NHS Foundation Trust) was performed to characterise self-inflicted burn (SIB) injuries.

Referrals were retrieved from the MDSAS referral platform (17/5/2017 – 9/1/2026 inclusive) and screened using select keywords to identify SIB, with manual review and reverse patient searching to maximise capture. Demographic data and injury details (type, location and TBSA) were collected and analysed securely.

Additional data were obtained from the regional IBID database, capturing burns tagged as self-inflicted or suicidal intent, with clinical follow up, management and outcomes recorded.

HIGHLIGHTS

497 injuries for **227** patients, **30.4%** re-referred
Females 73.6% of patients, **83.7%** of referrals
25 referred >5 times, **7** referred > 10, **30** max
Aerosol cold burns 33% of all injuries, **OR 3.21** repeated self-injury
49 admissions, **138** clinic, **2034** LOS, **761** in ICU
191 theatre trips, **583.8** hours operating

RESULTS

Demographics

- 497 SIB referrals for 227 unique patients, 2.4%** (497/20364) of all referrals from May 2017 – January 2026
- Patients & referrals predominantly female:** 167 F (416 referrals; 2.54 per patient), 60 M (87 referrals; 1.22 per patient)
- Female patients younger:** F 31 median, IQR 18.5 vs. M 38.5 median, IQR 28.25 (p = 0.007)
- Female patients more likely to be re-injure and be referred:** OR 3.18, 60/167 F; 35.9% vs. M 9/60 M; 15% (p < 0.001)
- MH background strongest predictor of repeated referral** (71 patients, 273 referrals, OR 5.21, p < 0.001)
- 25 patients referred >5 times, 7 patients referred >10 times,**
- Most referrals for one patient – **30 unique referrals**

Burn Type

- Cold burns most common** (172, 34.6%), followed by contact (104; 20.9%), flame (100; 20.1%)
- Cold burns more common in females** (OR 5.8; 34.7% F vs. 8.3% M, p < 0.001), **scalds trend to male predominance** (28.3% M vs 16.2% F, p = 0.056)
- Cold and chemical burns more likely to repeat self injury** (OR = 3.21, p < 0.001, OR = 4.35, p < 0.03 respectively)

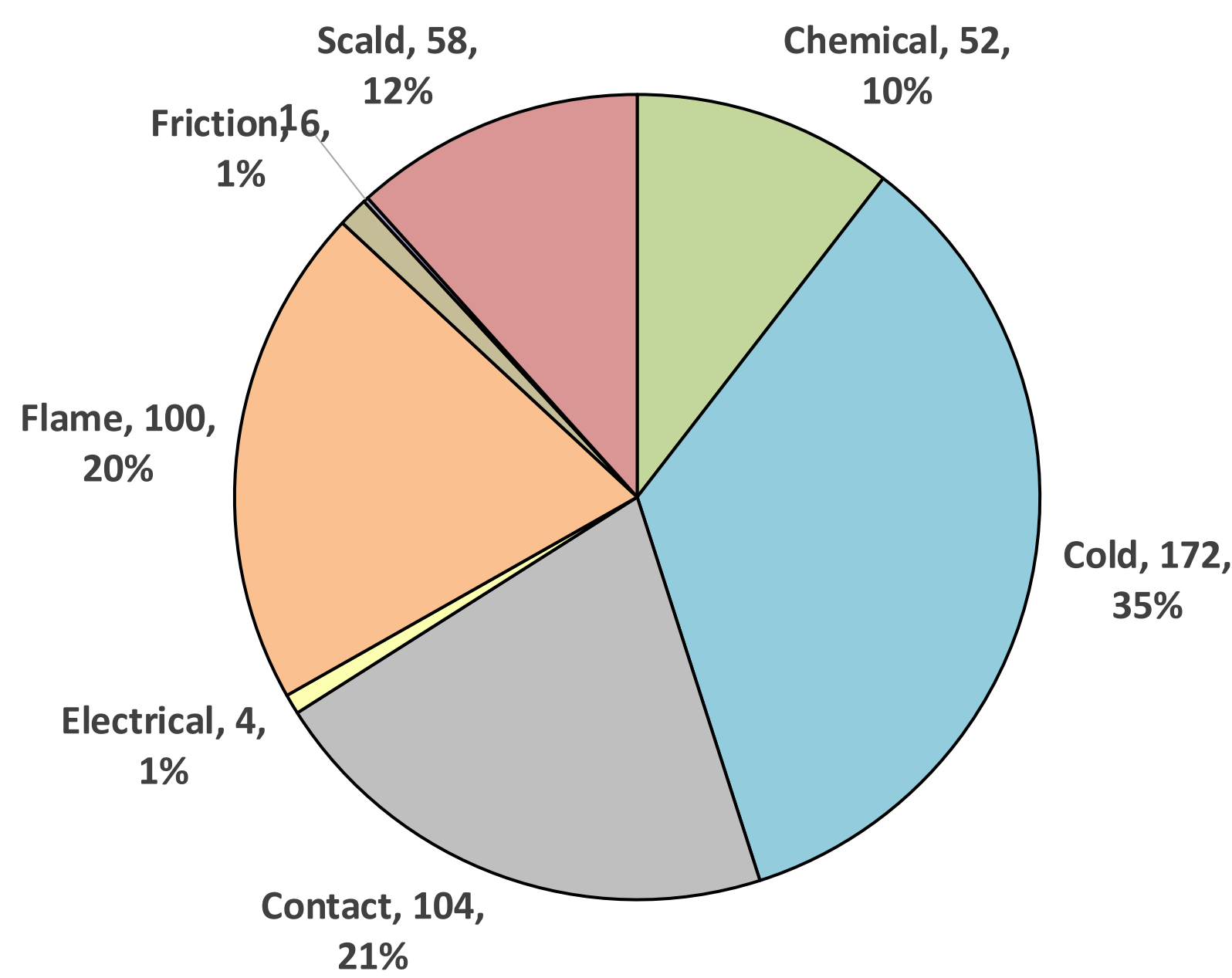


Figure 1 – SIB Referrals by Type (MDSAS Referrals 2017 – 2025)

Burn Implement

- Aerosol sprays most common implement of choice for self-harm** (164), followed by lighters (68), caustic soda (41), hot water (40)
- Females more likely to use aerosols** (54/167, 32.8% F vs. 5/60, 8.3% M, OR 5.26, p < 0.001), **males more likely to scald** (22/167, 13.2% F, 15/60, 25% M, OR 0.46, p = 0.042)
- MH patients more likely to use aerosols and cigarettes** (35.2% vs. 21.8%, OR 1.95, p = 0.036, 14.1% vs. 5.1% OR – 3.03, p = 0.032 respectively)
- Caustic soda, aerosols and cigarettes significantly associated with increased re-referral** (Caustic soda 6/8, 75% OR 7.43, p = 0.011, Aerosol 30/59, 50.8%, OR 3.42, p < 0.001, cigarette 10/18, 55.6%, OR 3.18 p = 0.029.

TBSA and site

- Upper limb (non-hand) injuries predominated** (n = 341), followed by hand (n = 126) and lower limb (n = 104)
- Flame burns were most severe** (mean TBSA 12.7%, median 1%, maximum 97%) compared to other mechanisms (Contact: mean 0.9%, median 0.3%, max 3%; Scald: mean 1.4%, median 1%, max 10%; Cold: mean 0.7%, median 0.4%, max 4%; Chemical: mean 0.8%, median 0.8%, max 3%).

Outcome

- 187 patients reviewed** by the burns service (82.3% of patients)
- 49 patients admitted** (21.6% of patients referred), totaling 2034 inpatient bed days, 761 at ICU level
- 35 patients managed surgically** (15.4% of patients), 191 operative episodes, 583.8 hours of operating time

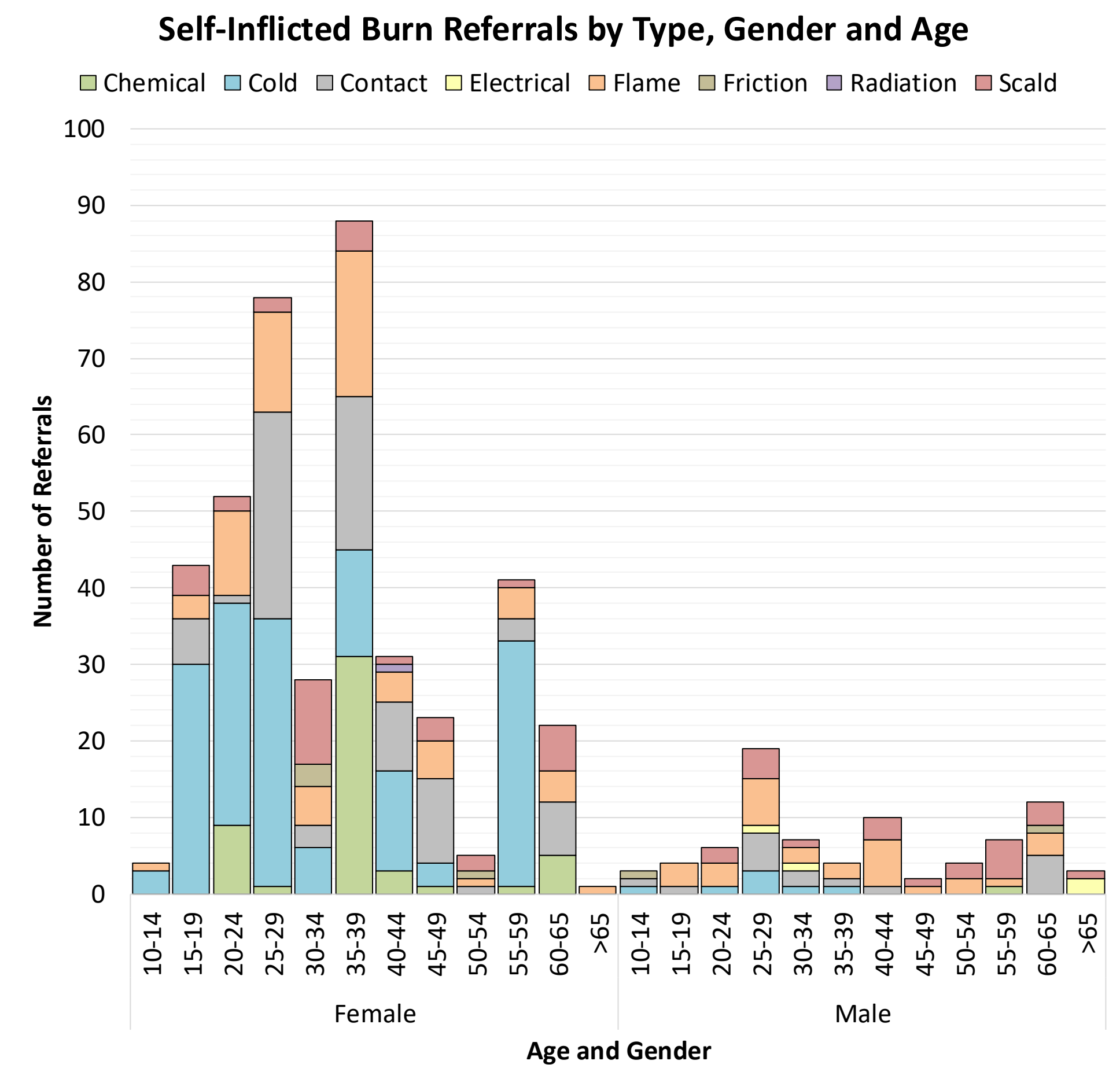


Figure 2 – SIB Referrals by Type, Gender and Age Range (MDSAS Referrals 2017-2025)

DISCUSSION & CONCLUSION

SIB represent a heterogeneous patient group, with a disproportionate impact on the burns service owing in part to their unique tendency towards repeated self-injury.

Two major groups emerged from the analysis. First, a small cohort of younger female patients sustaining repeated, low-severity injuries—predominantly from aerosol cold burns—which represented most referrals and outpatient workload. The second, predominantly male, sustaining severe single self-immolation injuries, accounted for most inpatient, ICU and operative resource utilisation.

The most common implements used amongst patients are readily accessible in the forms of aerosol spray cans, household chemicals and lighters/cigarettes. Increased recognition of the risks these seemingly innocuous articles pose is needed amongst healthcare professionals and mental health workers, perhaps through future public health campaigns. Notably, our data suggest that aerosol cold burns are far more pervasive than suggested in previous reports, forming a third of all injuries and repeated presentations.

Future work should focus on further characterising these groups and their motivations to identify patterns of behaviour earlier on and provide support for this vulnerable group of patients.

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