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How to train plastic surgeons of the future☆

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Summary   *Introduction:* Plastic surgery is a competitive and over-subscribed career choice despite minimal medical school exposure. We quantify factors influencing career interest in plastic surgery, speciality appeal and workforce planning. These findings optimise and refine evidence-based plastic surgery training and postgraduate selection criteria.
Methods: Medical students from two national plastic surgery courses complete a post-course questionnaire. Data categories included past experience and career interest in plastic surgery, sources of exposure, motivational factors, and sub-speciality interest. Data were recorded on modified Likert scales, with linear regression and t-test analyses performed.
Results: 175 students completed the questionnaire (81% response). Duration of medical student exposure to plastic surgery was significantly associated with career interest (Linear coefficient 0.12, 95% CI 0.08—0.17, P < 0.0001; r^2 = 0.15). 75 h experience is a significant cut-off to categorise students. Mean (95% CI) career interest is 31 percentage points higher in students with >75 h experience (89.2%, 83.2—95.2) compared to students with ≤75 h experience (58.1%, 52.9—63.3) (P < 0.0001). Influential sources included: (1) Operating Room (2) Consultant/Attending interaction (3) Resident interaction. Motivational factors towards a career in plastic surgery included operative satisfaction (91%), improving patient quality of life (89%), and reconstructive surgery (88%). Sub-speciality interests included: (1) Hand and Upper Limb (28%); (2) Cleft Lip and Palate (26%); (3) Burns (15%).
Conclusion: This study identified influential and motivational factors upon a career in plastic surgery. Medical student exposure can be tailored to maximise positive educational exposure to optimise evidence-based plastic surgery training and workforce planning.

Misconceptions about plastic surgery perpetuate in the United Kingdom and United States.[1–6] Public, medical professionals, and medical students inaccurately perceive plastic surgery as a primarily aesthetic rather than reconstructive speciality.[2,3] Furthermore, most primary care practitioners are unaware of plastic surgeons' involvement in hand surgery and lower limb trauma.[3] Given the scarcity of plastic surgery exposure at medical school, estimated to be present in less than 17% of medical schools,[7,8] misconceptions persist. Attempts to supplement medical student education exist through national courses,[2,13] training simulators,[12] elective opportunities to visit plastic surgical units,[10] membership initiatives of national societies,[9] and educational books aimed at medical students.[11] In the UK, a one day course for medical students significantly improves students' knowledge, surgical skills, and career interest in plastic surgery.[2] In the US, medical schools with dedicated plastic surgery training programs have higher success rates of entry to plastic surgery residency programs.[14,15]

Medical students are metaphorically analogous to pluripotent stem cells, capable of differentiation towards any speciality according to environmental exposure.[16] Consultant/Attending plastic surgeons significantly impact student career decisions, both positively and negatively.[17] Current trends towards earlier specialisation necessitates fast assimilation with ones chosen speciality, with many students maximising speciality exposure during medical school to strengthen integrated residency applications.[18] Despite this, plastic surgery remains a highly competitive speciality to complete formal training.

Clinical demand for reconstructive plastic surgeons is likely to rise,[18,22] therefore increasing the impetus for encouraging the best medical students to consider a plastic surgical career In a congested medical school curriculum, it is imperative to maximise educationally effective, career-positive and speciality relevant content for effective and stimulating evidence-based training. To achieve this, a complete understanding of why medical students choose a career in plastic surgery is required.

The study aims to analyse career ambition of medical students interested in plastic surgery. The primary outcome is to quantify reasons for choosing a plastic surgical career. Secondary outcomes include identifying the most influential factors behind this career interest and determine the projected subspecialty of medical students interested in a career in plastic surgery in order to inform workforce planning.

Methods

Questionnaires were distributed to all medical students at two national courses for medical students - the BAPRAS Undergraduate Course. The course was free of charge and open to all medical students from all years and location. Six categories of data collection were explored and quantified:

- **Category 1:** Sociodemographic data
- **Category 2:** Past experience in plastic surgery (Hours)
- **Category 3:** Career interest in plastic surgery
- **Category 4:** Preferred means of plastic surgery teaching
- **Category 5:** Sources of exposure to plastic surgery and their influence on career choice
- **Category 6:** Motivational factors for a career in plastic surgery.

In an attempt to inform workforce planning, students at one course were asked about subspecialty interest. Career interest was recorded using a modified Likert scale and converted to a score out of 100, from no interest (zero) to full interest (100). For Categories 5 and 6, students ranked a list of sources of exposure with their level of motivational influence. Categories quantified included (1) No influence (2) Mild influence (3) Moderate influence (4) Major influence. Space was provided for students to record any exposures or motivational factors not found on the pre-set list.

Statistical analysis

Data were collated and analysed using GraphPad Prism (GraphPad Software Inc, CA, USA) and Stata (StataCorp LP, TX, USA). Linear regression analyses quantified the association between duration of exposure and career interest. Linear regression output are presented as r^2 and linear coefficient, with 95% confidence interval (CI). Repeat analyses were performed after categorising according to gender, and also after removal of outliers. Proportions were calculated and plotted for influence.

Results

175 medical students from two national courses completed the questionnaire (81% response). Mean responder age was 23 years (range 18–45), with similar gender distribution, and diverse geographical locations (Table 1).

We found strong evidence of an association between hours of experience and career interest in plastic surgery (Linear coefficient 0.12, 95% CI 0.08–0.17, $P < 0.0001$; $r^2 = 0.15$) (Figure 1). This positive relationship between career interest and exposure is retained regardless of gender, as replicated in sub-analyses of female (Linear coefficient 0.14, 95% CI 0.06–0.21, $P = 0.001$; $r^2 = 0.13$) or male students (Linear coefficient 0.11, 95% CI 0.05–0.16, $P < 0.001$; $r^2 = 0.19$). One outlier was removed for this analysis, though the positive association retained significance even when including this outlier. Results were similar after performing a sensitivity analysis using hours of experience per medical school year instead of total hours of experience.