ORIGINAL ARTICLE

The prevalence of occupational dermatitis in the UK printing industry

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Aims: To quantify occupational ill health resulting from dermatitis in the UK printing industry and to explore links with particular processes and activities.

Methods: Approximately 2600 members of the Graphical, Paper and Media Union living in Nottinghamshire were sent a self completion questionnaire. A sample of respondents, both those who reported current skin problems and those who did not, were invited for a short dermatological examination.

Results: The overall response rate was 62%. A total of 1189 respondents were directly involved in the printing industry and categorised according to work in pre-press (25%), printing (46%), or finishing (42%) processes. A total of 490 respondents (41%) self reported having a skin complaint at some time. Prevalence was highest in males (43%) and those working in printing (49%), in particular those who cleaned rollers and cylinders or who came into contact with substances containing isocyanates on a daily basis. The most commonly affected areas reported were the fingers and webs between the fingers. Twenty six per cent of the 490 reported a current problem on the hand. Reported symptoms included itching (61%), rash (58%), and dry skin (56%). Although certain printing industry substances were thought by respondents to aggravate their condition, constant washing and friction was most often cited. Reported use of protective equipment and cleansing products was generally high, particularly by printers. Clinical examination confirmed the high self reported prevalence and also identified a substantial proportion of mild cases which were not reported. The overall prevalence of occupationally related skin complaints is estimated to be 40%.

Conclusions: A much higher prevalence of dermatitis has been identified than from routine surveillance schemes. The use of good quality records from unions with high membership facilitated access to workers across a range of company sites and printing processes. Validation of self reported symptoms through clinical examination was shown to be essential. The importance of non-chemical causes of dermatitis was highlighted. The findings point towards the need for the development of effective and acceptable risk reduction strategies, in particular to reduce water contact and friction.

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Over 2 million people each year are reported to suffer from ill health caused or aggravated by work.¹ Printing is one of the UK's largest manufacturing industries, employing around 170 000 people in more than 12 000 companies. Like many others, it presents a series of potential health hazards to its workers.² A number of printers are seriously injured or made ill each year through work, despite relevant health and safety legislation.¹

Dermatitis is a common condition which is reported to affect 15–20% of the UK population.³ Occupational dermatitis is a considerable burden to many industries. Approximately 4 million working days are estimated to be lost each year as a result of absenteeism resulting from work related skin disorders.³ During 1996, dermatological problems accounted for 23.4% of all work related health problems reported by UK occupational physicians.³ Printing is also thought to be a high risk industry for dermatitis.⁴ Results from reports from dermatologists to EPIDERM, the surveillance scheme for work related disorders, have indicated an annual incidence rate of approximately 85.8 dermatitis cases per 100 000 in printers.⁵ Potential skin irritants within the printing industry include alcohols, alkalis, developers, etching solutions, greases, waxes, and inks, and contact allergens such as potassium dichromate, dyes, formaldehyde, hydroquinone glues, and gums.

There have been many individual case reports and several small studies of the dermatological effects of chemicals in the printing industry. Nethercott and Nosal⁶ found that offset lithographic printing operations were related to potential adverse cutaneous effects, with 67% of operators having allergic contact dermatitis, 29% being caused by ultraviolet (UV)

cured ink components. Garabrant⁷ assessed the relation between dermatitis and the use of aziridine hardener (TMPTA) used in printing inks, and found the incidence highest in ink mixers. Plastic monomers, photosensitive acrylates (for example, Dycril and Nyloprint), polyurethane (Letterflex), and UV drying acrylics have all been found to be associated with dermatitis in printers.⁸ To date no studies have systematically quantified the burden and the precise type of occupational skin disease in the printing industry.

The aim of this study was to quantify occupational ill health resulting from dermatitis in the printing industry, and to explore links with particular processes and activities. The study was carried out in two stages: a self completion questionnaire survey followed by clinical examination of those who reported a current skin problem, and a sample who reported they had never had a problem. This paper focuses on stage 1 and gives only brief details of the results from stage 2, which is reported in detail elsewhere.⁹

METHODOLOGY

A self completion postal questionnaire containing questions on employment history, occupation, skin complaints, and allergy, together with covering letter and stamped addressed envelope was distributed to all currently employed 2647

Abbreviations: GPMU, Graphical, Paper and Media Union;
ICD, irritant contact dermatitis; UV, ultraviolet

Table 1 Number (%) of respondents reporting a skin complaint at any time by industrial process

Process	Number (%) of respondents reporting skin complaints	Total number involved in process
Total sample	490 (41)	1189
Pre-press	109 (37)	291
Typesetting	15 (25)	61
Photographic reproduction system	17 (30)	58
Platemaking	50 (42)	120
Stencil making	2 (33)	6
Etching and engraving	2 (29)	7
Gravure cylinder preparation	4 (57)	7
Stereo roller preparation	3 (100)	3
Proofing	11 (28)	39
Correction of litho plates	54 (50)	110
Printing	274 (49)	556
Inks with solvents	89 (48)	184
Paste inks	28 (49)	57
UV cured inks, varnishes, or lacquers	67 (45)	148
Water based inks	19 (43)	44
Plastisols	2 (100)	2
Inks, lacquers, adhesives containing isocyanates	42 (59)	71
Cleaning of litho rollers and cylinders	173 (49)	346
Cleaning letterpress and cylinders	10 (31)	32
Cleaning gravure rollers and cylinders	8 (47)	17
Cleaning flexographic rollers and cylinders	18 (47)	38
Screen cleaning	10 (48)	21
Cleaning digital printing machines	8 (44)	18
Reclamation of screens	0 (0)	1
Finishing	190 (38)	496
Laminating	2 (20)	10
Guillotining	49 (41)	121
Platen press	11 (23)	47
Handling of press room consumables	75 (46)	163

*Percentage of workers reporting daily involvement with the industrial process.

members of the Graphical, Paper and Media Union (GPMU), Central Branch, with a residential address within the Nottinghamshire county boundary. Two further mailings to non-responders were sent, giving an overall response rate from the mailing of 47%. In order to increase the final response rate companies who employed at least 10 non-responding members were targeted. Questionnaires were hand delivered to a nominated union member at each company for distribution to CPMU members and collected after completion.

RESULTS

Response

A total of 1500 (62%) questionnaires were received altogether, but only 1495 in time to be encoded and subsequently analysed. The questionnaires were initially categorised according to the collection method used, to determine whether there was a difference in the response. For example, it is known that response to postal surveys may vary between different groups defined by sex and age, with the poorest response being found in young adult males.¹⁰ Responses to all questions were similar between both groups. It was therefore felt appropriate to pool the data for analyses.

A blank questionnaire was returned by 121 respondents and a further 185 questionnaires indicated no involvement in any printing process (the GPMU has members from other industries such as paper manufacture). Both groups were excluded from any further analysis. The total number of questionnaires for further analysis was thus 1189. Eighty five per cent were men, and the majority of respondents were aged between 30 and 50 years old (59%), with 31% aged over 50, and only 10% aged under 30.

Occupational characteristics

Printing is frequently categorised according to the three main activities: pre-press preparation, printing, and finishing. Of those respondents directly involved in the printing industry ($n = 1189$), 25% participated in pre-press preparation, 47% in the printing process, and 42% in finishing. A small number of people worked in more than one of the categories listed above. Over half the men (53%) were employed in printing, with 34% and 28% involved in finishing and pre-press respectively. In contrast, the majority of women (87%, 159/183) were employed in finishing. Different types of printing techniques have evolved over time. Over half (57%, 677) of the respondents reported daily involvement with offset-litho printing and nearly a third of respondents, with web and sheet printing respectively (374 and 357 respectively).

Eighty one per cent (960) of respondents had been employed by their present company for more than three years and 59% (700) of all respondents stated that their previous employment had been in the industry. Of these 653 respondents who had had a prior printing job, over 25% (172) had spent more than 25 years in the industry. Over 200 different occupation titles were initially reported and were grouped into the three main activities—pre-press, printing, and finishing, and an “other” category which include titles such as proofreader, technician, warehouse staff, and manager.

Respondents reported daily involvement with a wide range of processes, with particularly high numbers involved in plate making, correction of litho plates, use of inks containing solvents, use of UV cured inks, cleaning of litho rollers and cylinders, and handling of press room consumables (table 1).

Table 2 Number (%*) of respondents by area affected and process

	(n)	Part affected				
		Fingers or webs	Back of hands	Palms	Wrists	Forearms
Pre-press						
Platemaking	(50)	32 (64)	23 (46)	13 (26)	7 (14)	6 (12)
Correction of litho plates	(54)	32 (59)	25 (46)	10 (19)	13 (24)	8 (15)
Typesetting	(15)	5 (33)	2 (13)	6 (40)	1 (7)	3 (20)
Photo reproduction	(17)	7 (41)	4 (24)	5 (29)	4 (24)	5 (29)
Printing						
Inks with solvents	(89)	44 (49)	36 (40)	18 (20)	22 (25)	24 (27)
UV cured inks, varnishes, or lacquers	(67)	35 (52)	23 (34)	13 (19)	13 (19)	21 (31)
Cleaning of litho rollers and cylinders	(173)	96 (55)	77 (45)	33 (19)	38 (22)	53 (31)
Paste inks	(28)	12 (43)	15 (54)	4 (14)	8 (29)	9 (32)
Water inks	(19)	9 (47)	5 (26)	5 (26)	2 (11)	6 (32)
Inks, lacquers, and adhesives containing isocyanates	(42)	25 (60)	13 (31)	11 (26)	12 (29)	12 (29)
Finishing						
Handling of press room consumables	(75)	42 (56)	31 (41)	14 (19)	16 (21)	16 (21)
Guillotining	(49)	29 (59)	22 (45)	10 (20)	4 (8)	9 (18)

*Percentages out of total reporting daily involvement with the specific process.

Prevalence of skin complaints

Of the 1189 respondents, 490 (41%; 95% confidence interval (CI) 37% to 45%) reported that they had suffered a skin complaint at some time, with this being higher in males (43%; 95% CI 40% to 46%) than in females (30%; 95% CI 23% to 37%), although the number of female respondents was relatively small. Those aged between 20 and 40 had the highest reported prevalence (199/433, 46%; 95% CI 41% to 51%). Prevalence was higher in those working in printing (49%) than in those involved in pre-press or finishing (38%) (table 1).

The prevalence of skin complaints at any time among the six industrial processes in which large numbers of workers had daily involvement, ranged from 42% to 50% (table 1). Although all workers involved in stereo roller preparation, and all using plastisols reported a skin problem, only very small numbers were involved. A similar range of prevalence of skin complaints was found in those involved in most of the other printing processes, although the prevalence was 59% for those using inks, lacquers, or adhesives containing isocyanates. The design of this particular question enabled respondents to provide multiple answers—that is, they were asked to indicate any process they were involved in on a daily basis. As a result, the prevalence figures do not reflect one process exclusively. For example, 30 (47%) workers using both UV cured inks and inks containing solvents reported skin problems.

The most commonly affected parts of the hand, face, or forearm were the fingers or webs between the fingers, with over half (261) of the 490 respondents who had suffered a skin complaint at some time reporting this, closely followed by the back of the hands (220 respondents). Palms, wrists, and forearms were reported to be affected by fewer respondents (106, 79, and 118 respondents respectively). The elbow, eyelids, and cheeks were least often reported as being affected (54, 33, and 55 respondents respectively). Those involved in printing suffered from more problems than those in pre-press or finishing. In particular, 70% of respondents with complaints of the wrist (55/79), 68% of respondents with complaints of the forearm (80/108), and 59% of respondents with complaints of the elbow (32/54) were involved in printing processes.

Respondents were also asked to shade affected areas on diagrams of the upper hand, face, and palm. Over 60% of the 490 who reported a skin complaint shaded the upper hand, with the largest percentage being among those involved in pre-press (70%, 76/109). In contrast, the highest proportion shading the diagram of the palm occurred among those

involved in finishing (47%, 89/190). The answers to this question corresponded with the written answers given as to the part of the hand, face, or forearm most commonly affected.

Table 2 shows the parts of the hand, face, and forearm affected by a skin complaint through daily involvement in specific printing processes. Across most processes, over half of those self reporting a skin problem indicated that their fingers were affected. A particularly high prevalence was reported by those using materials containing isocyanates (60%) and by those guillotining (59%). Around 40% suffered on the back of their hands, but those using paste inks were more affected (54%). More of those reporting daily involvement with UV cured inks, paste inks, and water based inks and cleaning of litho rollers and cylinders reported problems on the forearms.

Table 3 gives results for occurrence of the reported skin condition, frequency of occurrence, timing of first occurrence, and whether it cleared up during a period away from work. Just over a quarter of the 490 who reported a skin complaint (26%, 129) reported a current problem on the hand. Of these 129, nearly half were involved in finishing (49%), 43% involved in printing, and the smallest number involved in pre-press (24%). The highest proportion of people affected with a current problem on the hand were those in daily contact with solvents or handling consumables: 17% (23 respondents) and 16% (21 respondents), respectively. Those involved in platemaking (12%, 16 respondents), and correcting litho plates (11%, 15 respondents), or with daily exposure to a UV process (9%, 12 respondents) and chemicals such as isocyanates (8%, 10 respondents) also reported relatively high current problems.

Nearly a fifth (19%) of the 490 reporting suffering a skin complaint at some time had suffered a problem on the hand in the past three months (table 3). Over half (55%) of those ever suffering a hand complaint reported that the problem had occurred several times with a clearance in between. Much smaller numbers reported current or past problems on the face and forearm. Fifteen per cent reported that they had a permanent hand problem, 8% a permanent facial problem, and 6% a permanent forearm problem (table 3).

Overall, 356 respondents, nearly three quarters of the 490 who had ever had a skin complaint, reported that the problem cleared up when away from work (table 3). The occupations of principal concern were printing (57%, 204/356) and finishing (39%, 140/356). A high proportion of the 356 respondents whose problem cleared up away from work reported daily involvement in processes such as platemaking (10%), correction of litho plates (11%), solvent use (18%), UV use (14%),

Table 3 Occurrence of skin problems

	Number (%) of respondents reporting skin complaints at any time on:		
	Hand	Face	Forearm
Occurrence of skin condition			
I have it at the moment	129 (26)	48 (10)	43 (9)
Not at moment but in past 3 months	91 (19)	29 (6)	33 (7)
3–12 months ago	66 (14)	10 (2)	24 (5)
Over a year ago	68 (14)	14 (3)	24 (5)
Frequency of occurrence			
Only once	49 (10)	9 (2)	17 (3)
Several times with clearance in between	267 (55)	58 (12)	85 (17)
Permanent problem	73 (15)	37 (8)	28 (6)
Age at first occurrence			
<5 years of age	48 (10)	14 (3)	23 (5)
5–16 years of age	29 (6)	6 (1)	10 (2)
Since age 16	296 (60)	78 (16)	95 (19)
Clearance away from work (any part of hand, face, or forearm)			
Yes	356 (73)		
No	75 (15)		

*Out of total of 490 reporting a skin problem.

use of isocyanates (9%), guillotining (12%), and handling consumables (17%). By far the largest group were those involved in daily cleaning of litho rollers and cylinders (37%), despite 97% of this group reportedly using personal protection in the form of gloves, overalls (74%), and skin care products (60%). The majority of respondents with either a hand, face, or forearm problem also reported that the problem first occurred after the age of 16, and hence was not caused by childhood atopic eczema.

The most frequent symptom on the hand, face, or forearm reported by the 490 respondents who had ever had a skin complaint was itching (61%), closely followed by rough skin or rash (58%), dry skin with flaking (56%), redness (55%), and cracks or crusting (51%). Burning, prickling, or stinging affected 28% of respondents and 17% also reported pain.

Forty seven per cent of the 490 respondents with a skin complaint at any time (228) reported that contact with certain substances aggravated their condition, with 16% reporting that this did not occur and 26% being undecided. Work related substances were thought by a large proportion of those suffering to be aggravating a skin condition. Wash up solutions used on printing machines were cited by 36% of respondents as a possible cause and 44% listed other work related substances. These included 19 reports of inks and solvents, five reports of UV varnish, three reports of UV ink, four reports of developer, and a single report of methyl ethyl ketone. Washing powders, cleaning agents, and personal soaps, both at work and in the home were cited as problems. Over 50 different other work related substances were listed by respondents. These included: blanket washes, cleaning solvents, developers, hand cleansers, inks, thinners, UV inks, and coating materials, glues, oils, and metals, all of which may be found in the workplace, as well as soaps and perfumes. A small number of respondents also emphasised the problem of repeated washing, which aggravated their condition.

Six per cent of the 490 respondents reported that they had had time off work for a skin complaint, of whom 14% had taken a day and 25% up to one week. For the 29% who reported more than a week's absence, time away ranged from 1 week to 25 weeks. A move to a different job within the printing industry because of the severity of a skin complaint was reported by nine cases. Of these, six had a confirmed medical diagnosis of dermatitis, two were psoriasis cases, and one had a confirmed allergy to nickel. Visits to either a general practitioner, occupational doctor, or nurse had been made by

219 of all those reporting a skin complaint, of whom 36 had also seen a dermatologist.

The final topic in the questionnaire was allergy. This question was poorly completed by all respondents, with 47% of the 490 who suffered a skin complaint at some time and 67% of those who did not report a skin complaint omitting this question. However, of the 490 who reported a skin complaint, 29% reported that they suffered from hay fever and 20% that they suffered from asthma. This compares with 22% and 11%, respectively, of those not suffering a skin complaint.

Use of protective measures

Table 4 shows the numbers and percentages of respondents reporting use of protective equipment and cleansing products and the frequency with which hands were cleaned. In total, 67% of the 1189 respondents used gloves and nearly 60% wore overalls. However, 91% of the 550 printing process workers and 68% of the 289 pre-press preparation workers wore gloves, but only 44% of the 497 finishing workers did so. Printers reported a higher use of other protective equipment and frequency of hand washing and the use of cleansing products. In spite of this reported high use of protective measures, printing process workers generally reported the highest frequency of problems.

Of the 129 with current hand problems, almost 70% reported washing their hands more than three times per day, and protection was taken by using gloves (68%) and barrier creams (38%). In addition, nearly three quarters of all those 356 respondents whose problem cleared up away from work also took care to wash their hands more than three times per day, and over 50% used either a barrier cream or work cleanser.

Other comments from respondents

At the end of the questionnaire there was a section in which respondents could write comments on any aspect covered by the questionnaire; over 180 respondents did so. The comments covered more details about skin problems, their possible causes, other non-skin complaints, general work conditions, and the use of protective equipment.

Although the survey has shown that gloves are worn by a large proportion of the workforce, particularly those in the printing category, some respondents commented that the gloves themselves caused problems, such as latex allergy, or made hands too warm and uncomfortable. Some also commented that it was difficult to do particular tasks efficiently when using gloves.

Table 4 Use of protective measures by printing process

Protective measure	Number (%) of respondents using protective measure			
	Pre-press (n=289)	Printing (n=550)	Finishing (n=497)	Total (n=1189)
Protective equipment				
Gloves	200 (68)	506 (91)	219 (44)	792 (67)
Overalls	138 (47)	414 (74)	239 (48)	697 (59)
Footwear	81 (28)	290 (52)	103 (21)	407 (34)
Glasses	67 (23)	127 (23)	79 (16)	224 (19)
Ear plugs	65 (22)	299 (54)	227 (45)	516 (43)
Skin care	104 (35)	327 (59)	144 (29)	482 (41)
Barrier creams	94 (32)	323 (58)	174 (35)	493 (41)
Hand washing frequency				
Never	43 (15)	9 (2)	74 (15)	117 (10)
0–2 times per day	92 (31)	102 (18)	152 (30)	311 (26)
3–5 times	80 (27)	289 (52)	157 (31)	467 (39)
>5 times	65 (22)	151 (27)	75 (15)	231 (19)
Use of cleansing products				
Work cleansers	133 (45)	383 (69)	210 (42)	615 (52)
Afterwork cleansers	56 (19)	146 (26)	98 (20)	255 (21)
Nothing	77 (26)	57 (10)	86 (17)	203 (17)
Other	24 (8)	23 (4)	43 (9)	78 (7)

*Percentage of total respondents involved in each printing process.

Several respondents commented on general ventilation and temperature conditions in their workplace. These ranged from air conditioning being too cold, and adding to the potential for hands to become chapped or split, to very hot and dry conditions.

Dust and fumes were cited as causing non-skin complaints including irritation to the eyes, nose, and throat, and headaches. Two respondents mentioned musculoskeletal problems, particularly in the hands, wrists, and arms.

Interestingly, two people used this section to comment on the good provision of skin care advice and protection at their workplaces, including an emphasis on the use of barrier and after work creams, and an occupational nurse who regularly checked their skin.

Clinical examinations

All respondents who reported that they had suffered from a skin problem and that they had a current problem, the “cases”, and a random sample of “controls” who reported that they had never suffered from a skin complaint were invited to a skin clinic at Queen’s Medical Centre, Nottingham for a clinical validation of their questionnaire response. Forty five cases of self reported dermatitis and 60 control subjects were seen out of 127 and 253 invited, respectively, response rates of 35% and 24%.

All 45 cases of self reported current dermatitis were confirmed by clinical diagnosis. Occupationally related irritant contact dermatitis (ICD) was diagnosed in 20 (44%), of whom three also had psoriasis. Ten (50%) had a mild form of disease and nine (45%) a moderate problem. Only one case was diagnosed as severe. Overall 26 (58%) of the 45 cases were thought by the dermatologist to be suffering from a complaint that was occupationally related. Other skin diseases that were diagnosed but not considered to be occupationally related included polymorphic light eruption, rosacea, sebaceous eczema, and poikiloderma.

Of those who had reported they had never had a skin complaint, 21 (35%) were diagnosed with a skin problem, with occupational association thought likely in 17. All were of mild or moderate severity.

DISCUSSION

This study aimed to investigate the prevalence of dermatitis in the Nottinghamshire printing industry; reported findings

indicate that the study was largely successful. Forty one per cent of respondents reported that they had suffered a skin complaint at some time; validation through clinical examination confirmed a medical diagnosis in all cases of self reported current dermatitis, of which 44% had occupationally related ICD.

The sample of Nottinghamshire printers was selected from the GPMU Central Branch membership database. Membership of the union is thought to represent 70–80% of all printing production industry workers in the region, and includes most printing companies in Nottinghamshire. Data are not available to enable direct comparisons to be made of the characteristics of union and non-union members. However, it is thought by the Union that differences, for example, in age and sex distribution, are likely to be small (personal communication) and that the Nottinghamshire printing industry is representative of the UK printing industry as a whole.

This survey has highlighted the difference in response rates obtained using two different approaches to delivery and collection of questionnaires, though a good representation of the various printing methods was achieved in both. Achievement of the 62% response rate was largely a result of the positive contribution and active participation of GPMU Central Branch staff and the high degree of trust held among its members. This was also evident in the successful liaising with union representatives during the personal delivery of questionnaires to individual companies and the high uptake of clinic appointments by both cases and controls.

The response rate compares well with other postal surveys of individuals in the general population. For example, the Trent Health Lifestyle Survey, which targeted the adult population in the Trent Health Region, which includes Nottinghamshire, achieved a response rate of 61%.¹⁰ In other similar surveys the response rate has varied between 55% and 70%.¹¹ The response rate in the present study also compares favourably with those achieved by other industry based health related surveys.^{12–13} There were no major differences in age distribution between respondents and non-responders.

The prevalence of 11% with a current skin problem on the hand (26% of all those who had suffered a skin complaint at some time) is very much higher than the incidence reported by EPIDERM of 85.8 cases per 100 000 in printers seen by a dermatologist.⁵ The EPIDERM surveillance system is generally completed by about two thirds of consultant dermatologists (with a 75% response rate) and occupational health physicians

(with a 87% response rate), who see only a small proportion of cases and probably the most severe. It is therefore not strictly comparable with the present study. In addition, it is interesting to note that, whereas printers have the second highest rate per 100 000 workers estimated from reports by dermatologists to EPIDERM, they do not appear in the ranking from reports by occupational physicians.⁵ This indicates a general lack of occupational health provision in the printing industry.

The importance of a clinical examination to validate self reporting has been highlighted in other studies of dermatitis.¹⁴ In this study, 58% and 28%, respectively, of the skin complaints of the cases and controls were diagnosed at clinical examination to be occupationally caused or exacerbated. Using the size of the groups of cases and controls selected for a clinical examination as weights, the overall prevalence of occupationally related skin complaints for the cases and controls can be estimated to be 40%. It should be noted that there was an intermediary group who reported having had a skin complaint at some time but who did not have a current problem. These respondents were not invited for a clinical examination. It is possible that the prevalence of occupationally related skin complaints in this group lies somewhere between those of the cases and controls described here.

Those involved in printing processes tended to have a higher self reported prevalence of problems related to the forearms, which reflects both the substances used and repeated contact with various liquids such as wash ups. This suggests that, despite a high use of gloves, lack of protection for the arms may be a problem and one which could be addressed through better skin care provision. Those using finishing processes reported a lower use of personal protective equipment, partly owing to discomfort, heat, and friction.

A previous postal survey of UK companies investigated the provision of skin care facilities,¹⁵ and particularly targeted the printing industry. Provision of barrier creams and other cleansers was common in the printing companies surveyed; the present study confirms this, with over half of the respondents using cleansers. However, some respondents in the present study drew attention to the fact that the cleansers could themselves cause skin problems, as could the constant contact with water. Although used by a large proportion of respondents, attention was also drawn to the potential problems caused by protective gloves, both to the skin and in inhibiting work activities.

Conclusions

This survey has identified a high prevalence (approximately 40%) of dermatitis among printers in the Nottinghamshire area, with an incidence of current skin complaints of about 26%. A good coverage of both printers and processes was achieved across the industry. Results are thus probably generalisable to the UK as a whole and highlight the fact that skin problems are an important problem in the printing industry.

The study has shown that the use of union records can be successful as long as data quality is regularly verified and a high membership is maintained. Union records facilitate access to a range of company sizes, including smaller establishments, which is difficult to achieve in many occupational studies. The use of two different methods of data collection in this study has highlighted the successful utilisation of contact through union officials, resulting in a good response

rate and fewer missing values on the questionnaire. Future studies of industries in which a high proportion of workers are members of a union would benefit from adopting this method.

The study has shown the difficulties of establishing the true prevalence of skin problems through self reporting, and has shown that validation through clinical examination is essential. Those working in the printing area and involved in cleaning of printing machinery showed the greatest tendency towards skin problems. Although a few substances of concern were identified, the importance of non-chemical causes such as friction and irritation as a result of repeated washing were highlighted. Reduction in wet work is a target for future occupational health intervention, as it affects so many workers.

This study has shown that the many existing skin policy and guidelines documents available for the printing industry do not, at present, appear to be being sufficiently implemented. A study is now underway to develop effective and acceptable strategies to reduce the risk of dermatitis in the UK printing industry.

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