

Evaluation of two self-administered questionnaires to ascertain dermatitis among metal workers and its relation with exposure to metal working fluids

**Berna van Wendel de Joode,^{1,2}
Roel Vermeulen, Dick Heederik,
Kees van Ginkel, Hans Kromhout**

¹ Utrecht University, Institute for Risk Assessment Sciences, NL

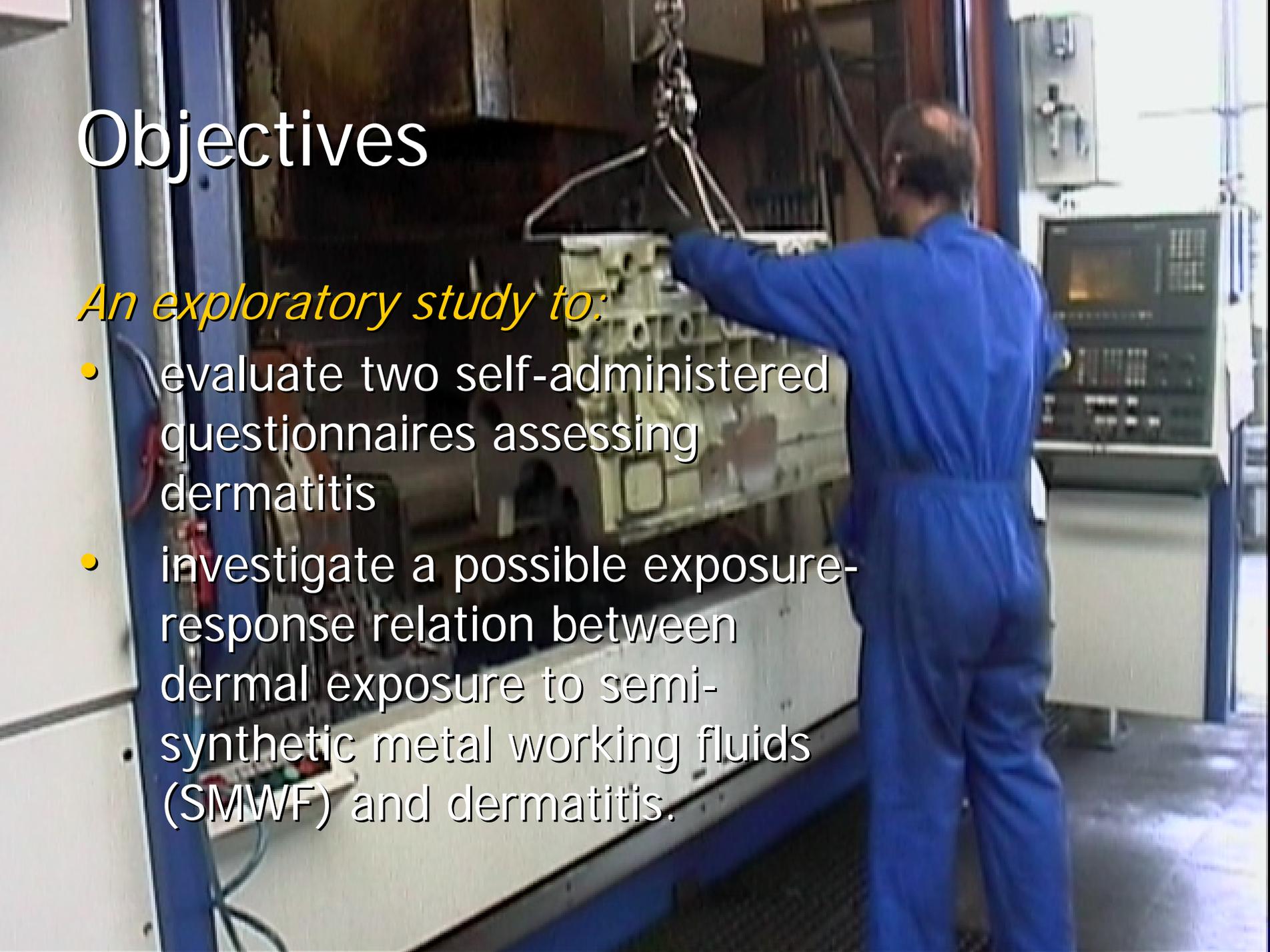
² Currently at Universidad Nacional, IRET, CR

Background

- Workers exposed to MWF account for 8% of all work-related skin diseases
- Incidence rate of 10 per 10.000 metal workers per year
- Few large epidemiological studies
- Need for validated self-administered questionnaires on dermatitis
- One attempted to assess dermal exposure quantitatively



Objectives

A photograph of a worker in blue overalls operating industrial machinery in a factory setting. The worker is seen from the back, reaching towards a large piece of equipment. The background shows various industrial components and a control panel with a screen.

An exploratory study to:

- evaluate two self-administered questionnaires assessing dermatitis
- investigate a possible exposure-response relation between dermal exposure to semi-synthetic metal working fluids (SMWF) and dermatitis.

Methodology 1.

- Cross-sectional study
- Truck factory
- 80 Metal workers exposed to semi-synthetic metal working fluids (SMWF)
- 67 Referents
 - assembly line workers
- Dermal exposure to SMWF
 - semi-quantitatively (DREAM)
 - quantitatively VITAE



Methodology 2. Dermatitis

Traditional questionnaire (*Smit et al., 1993*)

One or more reported symptoms in the past 12 months

- red swollen hands or fingers
- red hands or fingers with fissures
- vesicles on the hands or at the sides of the fingers
- scaling hands or fingers with fissures
- itching hands or fingers with fissures)

that were recurrent or lasted more than three weeks



Methodology 3. Dermatitis

Skin-screening list (*ISTl, 2001*)

- a positive answer to the question: " did you have a skin disorder in the past 12 months that is similar to one or both pictures"



Methodology 4.

- Two dermatologists examined workers' hands in a subset of the studied subjects (N=47), within two to six weeks (three weeks on average) after filling in the questionnaires
- Information was obtained on factors possibly related to dermatitis such as age, working years, hand washing, glove use, leisure activities, hay fever, infantile eczema, smoking, and educational level.

Results 1. Self-reported dermatitis

	Metal workers (N 80) % (CI)	Referents (N 67) % (CI)
Traditional		
Hands	21.3 (12.3 – 30.2)	28.4 (17.6 – 39.2)
Pictures		
Hands	15.0 (7.2 – 22.8)	10.5 (3.1 – 17.7)
Hands, fore arms and face	23.8 (14.4 – 33.1)	10.4 (3.1 – 17.8)

Results 2. Validity statistics of self-reported hand dermatitis (N 47)

	Traditional	Pictures
Sensitivity	0.86 (0.77 – 0.96)	0.36 (0.23 – 0.50)
Specificity	0.64 (0.50 – 0.78)	0.84 (0.74 – 0.94)

Cohen's kappa 0.45, 95% CI: 0.28 – 0.68

Results 3. Crude Prevalence Ratios

Low (N 33) and high (N 47) exposed workers versus referents (N 67)

Dermal exposure to SMFW	Traditional Hands	Pictures Hands	Pictures Hands, fore arms, and face
Low (N 33)	0.7 (0.3 – 1.6)	2.0 (0.6 – 3.4)	2.0 (0.8 – 5.3)
High (N 47)	0.8 (0.4 – 1.5)	1.0 (0.3 – 3.0)	2.4 (1.0 – 5.7)

Results 4. Prevalence Ratios adjusted for hand washing and car repairing

Low (N 33) and high (N 47) exposed workers versus referents (N 67)

Dermal exposure to SMFW	Traditional Hands	Pictures Hands	Pictures Hands, fore arms, and face
Low (N 33)	1.0 (0.5 - 2.4)	2.6 (0.9 – 7.2)	2.0 (0.7 – 5.1)
High (N 47)	0.8 (0.4 – 1.6)	1.1 (0.4 – 3.2)	2.4 (1.0 – 5.8)
Hand washing	0.7 (0.4 – 1.2)	0.9 (0.4 – 2.1)	1.0 (0.5 – 1.9)
Car repairing	1.8 (1.0 – 3.3)	1.4 (0.6 – 3.7)	0.9 (0.4 – 2.1)
Gardening	1.5 (0.9 – 2.7)	1.4 (0.6 – 3.3)	1.5 (0.7 – 3.2)
> 7 company working years	0.6 (0.3 – 1.0)	0.4 (0.2 – 1.0)	0.7 (0.4 – 1.5)

Limitations

- Cross-sectional design → selection bias e.g. healthy worker effect?
- Small study size
- Moderate response rate
 - Exposed 62%
 - Referents 66%
 - Non-responders similar age and working years
- Assembly workers: appropriate referent group?

Conclusions

- The questionnaires appeared to detect different degrees of dermatitis
- Picture-based
 - More severe cases of dermatitis
 - Possible exposure-effect relation for reported dermatitis on hands, fore arms, and face
 - Seemed more appropriate due to higher specificity resulting in less false-positives
- Repeat study in larger study population with a prospective design

A worker in a blue shirt is operating a machine in a factory setting. The machine is a large, industrial-grade device with a prominent orange frame and a large, curved metal component. The worker is standing to the left of the machine, looking at it. The background shows a factory floor with various pieces of equipment and a large window. The text "¡Gracias por su atención!" is overlaid on the image in white. The machine has the text "KCP-2400" visible on its upper part.

¡Gracias por su atención!

Quantitative dermal Exposure Assessment VITAE

