SHORT REPORT

The effectiveness of an educational programme on occupational disease reporting

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Background: Occupational diseases are under reported. Targeted education of occupational physicians (OPs) may improve their rate of reporting occupational diseases.

Aim: To study the effectiveness of an active multifaceted workshop aimed at improving OPs' reporting of occupational diseases.

Methods: We undertook a comparative study with 112 OPs in the intervention group and 571 OPs as comparisons. The intervention was a 1-day workshop. Measurements of occupational disease reporting activity in both groups in 6-month periods before and after the intervention were collected via the national registration system. Measurements of OPs' knowledge, self-efficacy and satisfaction were made in the intervention group. Differences between the groups and predictive factors for reporting were subsequently analysed statistically.

Results: The percentage of reporting OPs after the intervention was significantly higher in the intervention group compared to the comparison group at 19 versus 11% (P < 0.01). No differences were found in the average number of reported occupational diseases per reporting physician after the intervention: 3.7 (SD 5.37) versus 3.4 (SD 4.56) (not significant). The self-efficacy score was a predictive factor for reporting occupational diseases (P < 0.05). Measurements of knowledge and self-efficacy increased significantly (both parameters P < 0.001) and remained after half a year. Satisfaction was high (7.85 of 10).

Conclusions: An active, multifaceted workshop on occupational diseases is effective in increasing the number of physicians reporting occupational diseases. Self-efficacy measures are a predictive factor for such reporting.

Key words Continuing medical education; occupational diseases; occupational physicians.

Introduction

Prevention and reporting of occupational diseases are core activities for occupational physicians (OPs) [1,2]. However, there is considerable under-reporting of occupational diseases [3] and the reporting rate of OPs should be improved [4]. In this study, we investigated whether appropriately targeted continuing medical education (CME), in the form of a 1-day active multifaceted workshop, was effective in improving OPs' subsequent reporting activity [5]. Earlier studies suggested that outcome measures of performance should be actual reporting rates rather than self-assessment measures [6].

Methods

OPs from large occupational health services (OHSs) in The Netherlands participated in the study. OPs in the intervention group attended a 1-day, multifaceted, in-company workshop focussing on the reporting of four occupational diseases of which Dutch notifying guidelines are available. OPs in the comparison group were selected from the database of the National Centre of Occupational Diseases and did not receive any educational intervention. They were comparable in the type and sizes of companies for which they provide care.

A comparative study was set up with measurements of occupational disease reporting activity during 6-month periods both before and after the workshop. In addition, we assessed several educational outcome parameters in...
the intervention group: at the start of the workshop, directly after and 6 months later. Key elements of the workshop were participants’ presentations on the four notifying guidelines (peer teaching), practising of reporting occupational disease cases and discussion about beliefs and barriers.

Primary outcome measures were the percentage of OPs reporting occupational diseases and the average number of reported cases of occupational diseases per OP. Educational outcome parameters in the intervention group were self-reported knowledge, self-efficacy and satisfaction. Self-efficacy refers to participants’ confidence in reporting occupational diseases, and satisfaction refers to their view of the value of the workshop.

The effect of the intervention was analysed by comparing subsequently the percentage of reporting OPs, in both groups, adjusted for baseline reporting. We also performed a subgroup analysis to estimate the probability of reporting occupational diseases after the intervention (in both groups) for OPs who did or did not report occupational diseases before the intervention. Finally, the difference in number of reported occupational diseases per (potential) reporting OP between the intervention and control groups was analysed, adjusted for baseline reporting.

Analyses of primary outcomes were performed in SAS 9.1 with a non-linear mixed procedure with a zero-inflated Poisson model because the distribution was very skewed towards zero. Possible predictive factors for reporting occupational diseases were analysed with logistic regression. Differences in self-reported knowledge, self-efficacy and satisfaction were analysed with paired samples t-tests. Logistic regression analyses and t-tests were performed with SPSS 12.0.1. P-values < 0.05 were considered statistically significant.

### Results

A total of 112 OPs in the intervention group and 571 OPs in the comparison group were included in the study. The percentage of reporting OPs after the intervention was significantly higher in the intervention group compared to the comparison group: 19 versus 11% (P < 0.01) corrected for reporting before the intervention) (Table 1). For OPs who did not report before the intervention, the probability of reporting after the intervention was 0.17 (95% CI 0.09–0.24) for the intervention group (n = 98) and 0.08 (95% CI 0.06–0.11) for the comparison group (n = 489). For OPs who did report before the intervention, the probability of reporting after the intervention was 0.53 (95% CI 0.36–0.69) for the intervention group (n = 13) and 0.33 (95% CI 0.24–0.43) for the comparison group (n = 82).

Table 2 shows that the reported number of cases of occupational disease and the mean number per reporting OP did not differ significantly between the groups: 3.7 (SD 5.37) versus 3.4 (SD 4.56). The differences in self-reported knowledge and self-efficacy in the intervention group between the start of the workshop and follow-up after 6 months were both significant (paired samples t-tests, P < 0.001). The satisfaction score of the participants directly after the workshop was 7.85 (SD 0.56, n = 97). This score remained high at follow-up with 7.80 (SD 0.66, n = 33). The self-efficacy score after the workshop was predictive for being a reporting OP in the intervention group, OR 1.32 (<0.05). The other factors in our analyses (knowledge score after the workshop and experience as an OP) were not significant in the univariate analysis, so we did not apply a multivariate regression analysis.

### Discussion

The active multifaceted workshop proved to be effective in increasing the number of reporting OPs. No effect was found on the number of reported cases per reporting physician. Self-efficacy was shown to be a predictive factor for reporting. Measurements in the intervention group indicated a positive and enduring effect on knowledge, self-efficacy and satisfaction of the participants.

Strong points of this study include the large sizes of the intervention and comparison groups and the objective

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**Table 1.** Percentages (and numbers) of OPs reporting occupational diseases, in intervention and comparison group, before and after the intervention

<table>
<thead>
<tr>
<th></th>
<th>Intervention group, N = 111&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Comparison group, N = 571</th>
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<tbody>
<tr>
<td>Before</td>
<td>12% (13)</td>
<td>14% (82)</td>
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<tr>
<td>After&lt;sup&gt;b&lt;/sup&gt;</td>
<td>19% (21)</td>
<td>11% (62)</td>
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<sup>a</sup>We excluded one extreme outlier in the intervention group.

<sup>b</sup>P = 0.0078, non-linear mixed procedure, zero-inflated Poisson model, corrected for reporting before the intervention.

**Table 2.** Reported numbers of occupational diseases (and mean per reporting OP), in intervention and comparison group, before and after the workshop

<table>
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<th>Intervention group, N = 111</th>
<th>Comparison group, N = 571</th>
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<tr>
<td>Before</td>
<td>73 (5.6, n = 13)</td>
<td>239 (2.9, n = 82)</td>
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<tr>
<td>After&lt;sup&gt;c&lt;/sup&gt;</td>
<td>78 (3.7, n = 22)</td>
<td>209 (3.4, n = 62)</td>
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<sup>c</sup>P = 0.93, non-linear mixed procedure, zero-inflated Poisson model, corrected for reporting before the intervention.
measurement of the performance of physicians before and after the educational programme. The measures in the intervention group suggest OPs’ ratings of self-efficacy are a predictive factor for subsequent reporting activity. A weaker point of this study is that we were not able to set up a randomized trial (or a precisely matched control group since we had no detailed information about the physicians in the comparison group). However, we assume that the groups did not differ significantly because the OPs worked in comparable OHSs.

The key result of this study is that the workshop increased the number of reporting OPs, a promising outcome for a study on CME effectiveness. The workshop may have stimulated OPs to consider the possible occupational aetiology of diseases and to be self-confident in their diagnosis, thus overcoming barriers to reporting them to the national centre. Education linked to the reporting system is considered important and is for example a core feature of the THOR-project (The Health and Occupation Reporting Network) in the UK [7]. The educational format of the active multifaceted workshop relies on peer teaching and a problem-oriented approach [8]. In this study, we demonstrated that such a workshop is a valuable tool in CME.

Acknowledgements

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Conflicts of interest

None declared.

References


Key points

- The under-reporting of occupational diseases impedes effective preventive policy making in the area of occupational safety and health.
- A multifaceted workshop for OPs improves their willingness to report and the number of physicians who actively report occupational diseases.
- Such interventions should be used to increase the number of OPs who actively report occupational diseases.