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EPIDEMIOLOGY | RESEARCH ARTICLE

A follow-up study of coping strategies of compensation claimants reporting an occupational injury associated with return to work/disability benefits in the subsequent year

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Abstract: *Purpose:* To describe coping strategies of claimants reporting an occupational injury associated with return to work/disability benefits in the subsequent year. *Method:* We included 5,782 respondents of a questionnaire (Brief COPE) at time of reporting an occupational injury to the National board of Industrial Injuries. We used register data on benefits from the Danish Ministry of Employment. Multivariate logistic regression was used with long-term disability benefit as outcome as a proxy of not returning to work. The analyses were adjusted for factors associated with disability benefits (severity of injury and social factors (education)). *Results:* A total of 714 (12.3%) received long-term disability benefits. A coping strategy of acceptance of the injury at time of report increased responders' possibilities of returning to work, and use of self-distraction, and support increased risk of long-term disability benefits. Claimants with reported accident were more likely to accept the injury than claimants with an occupational disease. There were only little differences in coping strategies according to compensation decision and return to work. *Conclusion:* Respondent claimants who at time of report accepted the injury and their situation had increased possibilities of returning to work in the subsequent year.

Subjects: Health & Society; Health Conditions; Medicine

Keywords: coping strategies; disability benefit; workers' compensation; return-to-work

1. Introduction

People respond to or cope with harm and loss in different ways. Coping may be defined as an effort to decrease threats, harms, and loss, or to reduce associated stress (Carver & Connor-Smith, 2010). Coping with a disease may be partly due to attitude and belief, however, relations between

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The key author works as a clinical specialist in public health and occupational medicine and has lately especially done research on disability benefits including sick leave benefits. The research centers on subjects, which have a clear clinical relevance. The present ongoing research is especially on disability benefits, work ability, and occupational claims.

PUBLIC INTEREST STATEMENT

Workers who have an occupational injury claim seem to improve their possibilities of returning to work if they acknowledge the injury; that is if they accept the fact that the injury actually had happened to them, and if they have learned to live with the injury and its consequences. If the workers' clinicians are aware of how the workers cope with their injury, they may be able to guide and help by introducing appropriate coping strategies.

personality and coping are only modest (Carroll et al., 2013; Carver & Connor-Smith, 2010). Coping style may affect recovery, e.g. through issues of compliance with therapy or medications, and self-blame and catastrophizing are generally described as non-adaptive or disadvantageous coping (Buitenhuis, De Jong, Jaspers, & Groothoff, 2008; Casey, Feyer, & Cameron, 2015; Elbers, Akkermans, Lockwood, Craig, & Cameron, 2015; Ferrari & Louw, 2011; Kurimay, Pope-Rhodus, & Kondric, 2017; Lawrence & Fauerbach, 2003; Schroevers, Kraaij, & Garnefski, 2007). Self-blame and catastrophizing may be described as ruminating, magnifying the event and feeling helplessness, which are passive or avoidance strategies. Likewise, calling in sick is a passive or an avoidant strategy, which, however, may be beneficial in some circumstances and not in others (Dawson, Schluter, Hodges, Stewart, & Turner, 2011). Passive avoidance coping strategies have been described to predict pain, disability and unfavorable outcome of work capacity (Dawson et al., 2011; Den Boer, Oostendorp, Beems, Munneke, & Evers, 2006). An occupational injury is more than just an injury or disease, and could induce more than just the harm itself as the workers' relationships within their work place may be affected, and their job may be lost or at stake. Coping with an occupational injury may therefore be partly different from just coping with the injury or disease. Injured workers with high long-term pain and high perceived disability have been found to catastrophize their pain, which may lead to poor recovery outcomes and affect return to work (Phillips, Carroll, & Voaklander, Gross, & Beach, 2012). Likewise, expectation of recovery, economic compensation, and waiting for approval from the workers' compensation system may affect return to work after report of an occupational injury (Cole, Mondloch, & Hogg-Johnson, 2002; Iles, Davidson, Taylor, & O'Halloran, 2009; Young, Besen, & Willetts, 2017).

To our knowledge advantageous coping strategies in order to continue at labor or to return to work fast after reporting an occupational injury to the workers' compensational claim system have not been described in general. Our aim was to describe and analyze coping strategies of compensational claimants who reported an occupational disease or industrial accident associated with return to work in the subsequent year stratified by decision of Workers' compensation system. We expected that claimants with some kind of active coping could be more likely to return to work and that compensation decision could have influence in the way that active coping and decision on compensation could promote return to work.

2. Methods

We conducted a study on claimants who from 1 January to 31 December 2014 reported an occupational injury to the National Board of Industrial Injuries. A total of 39,961 reported an occupational injury; we included 30,732 18–60 years old without permanent disability benefits at time of report and 5,782 (18.82%) responded to the questionnaire with questions of health and coping strategies.

Danish employees should report an occupational injury to the National Board of Industrial Injuries within 9 days after the injury was sustained. If doctors suspect an occupational injury, they have to report the injury to the National Board of Industrial Injuries. An occupational injury is either an industrial accident or an occupational disease. An accident is an unfortunate incident or exposure that occurs suddenly or within five days. An occupational disease is due to exposures over a relatively long time. An occupational disease can be reported up to a year after sustaining the injury or gaining awareness of the injury.

The National Board provided their registered injuries continuously, and every claimant received a letter by post and access to an electronic questionnaire shortly after report of the compensational claim. We extracted data on disability benefits from each claimant's personal number in the DREAM registry (Ministry of Employment, 2016). The method and study population have been further described previously (Rudbeck, Johansen, & Omland, 2018).

The outcome variable was disability benefits for personal income more than 80% of the year after reporting the injury. We defined disability benefit as sick leave benefits, any other temporary benefits, and permanent benefits received after report of injury; that is, benefits for abled

claimants, e.g., unemployment benefits, and educational support were not included. We expected claimants who did not receive disability benefit to have returned to work or to be able to. The workers' compensation system in Denmark does not include current sick leave benefits or other similar disability benefits. Instead, regardless of the compensation claim, the municipality grants current benefits to all the sick-listed after four weeks.

Carvers' coping strategies have been used in a variety of studies to measure coping strategies related to health conditions. We used Carvers' BRIEF COPE to monitor the prevailing coping strategies associated with an injury claim (Carver, 1997). Carvers BRIEF COPE include 12 coping strategies; self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, self-blame. An example of a question describing self-distraction: I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping. An example of a question describing active coping: I've been taking action to try to make the situation better. An example of a question describing use of emotional support: I've been getting comfort and understanding from someone. An example of a question describing use of instrumental support: I've been trying to get advice or help from other people about what to do. Each coping strategy was measured by two questions scored on a 4-point scale: I haven't been doing this at all; I've been doing this a little bit; I've been doing this a medium amount; I have been doing this a lot. We defined a score of at least four for a strategy in use; we believe that strategies with lesser scores are of little importance due to sparse use.

2.1. Statistics

We used Stata, StataCorp LP, Texas, USA/IC 13.1 in the analyses. Generally, coping strategy index was calculated by adding scores of the answers of both questions that described the strategy.

The statistical analyses:

- Baseline characteristics were analyzed with Chi Square 95% CI in Table 1.
- The answers in each of two questions describing a specific coping strategy were added, which produced an index 2–8. We have reported the mean, 95% CI in Table 2. We also, separately, reported the differences between occupational disease and industrial injury from multivariate analyses, including all coping strategies, severity of injury (number of visited therapists, number of different treatments), education, gender, and age, as shown in Table 2.
- Mean coping strategies according to gender are reported in Figure 1. Statistical differences between gender were analyzed by multivariate logistic regression including age.
- Mean coping strategies according to long-term disability benefits are reported in Figure 2. Statistical differences between disability benefits were analyzed by multivariate logistic regression including gender and age.
- We used multivariate logistic regression analyses to demonstrate coping strategies stratified by long-term disability benefits in occupational disease and industrial accident (Table 3). Multivariate logistic regression analyses with odds ratio (OR) and 95% CI included all coping strategies, severity of injury (number of visited therapists, number of different treatments), education, gender, and age.
- In Table 4 we have reported the mean of the coping strategies at use (4+) according to decision by the National Board of Industrial Injuries. We also used multivariate logistic regression analyses to demonstrate adjusted statistical significant coping strategies at time of reporting an occupational injury stratified by long-term disability benefit and decision from The National Board. Multivariate logistic regression analyses with OR and 95% CI included severity of injury (number of visited therapists, number of different treatments), education, gender, and age. We included all coping strategies at use; that is with mean 4+.

The Danish Data Protection Agency approved of the study (J-nr. 2012-41-09589).

3. Results

We included the 5,782 respondents of the questionnaire in the present analyses; 3,286 with occupational disease and 2,496 with industrial accident. Claimants who responded were older than non-responders, and female claimants had a higher response rate than males. Claimants who had received disability benefits 80% of the subsequent year had the same likelihood of completing the questionnaire at the time of reporting the injury as claimants receiving less disability benefits when stratified by the decision of the National Board of Industrial Injuries (Rudbeck et al., 2018). Table 1 describes the basic characteristics of the responders.

In the total population, 1,759 (11.46%) women received long-term disability benefits and 1,912 (12.44%) men ($P = 0.008$); 403 (11.86%) respondent women and 311 (13.04%) respondent men received long-term disability benefits ($P = 0.181$). Significant more men than women received long-term disability benefit after report of an occupational disease ($P = 0.032$) but there were no gender difference in industrial accident ($P = 0.968$).

Figure 1 demonstrates gender differences in coping strategies at time of reporting an occupational injury. In general, women used more active coping, emotional and instrumental support; men used acceptance and positive reframing.

Table 2 demonstrates coping strategies partly differed in occupational disease claim or industrial accident claim. The multivariate analysis showed that of used coping strategies self-distraction, active coping, and use of instrumental support were more prominent in occupational disease claimants, and use of acceptance were more prominent in industrial accident claimants.

3.1. Occupational disease

Figure 2 demonstrates coping strategies stratified by long-term disability benefits. Valuable coping strategies for returning to work seem to be active coping and acceptance, while self-distraction and use of support increased long-term disability benefits.

Table 3 showed the multivariate logistic regression analyses and the influence of health and social factors. No matter the severity of injury and the social influence the important coping strategies at use still differed, with self-distraction, active coping, use of emotional support and acceptance as the most important.

Table 1. Characteristics of respondent claimants at the time of reporting an injury according to receiving disability benefits 80% of the subsequent year

| | Occupational disease | | | Industrial accident | | |
|--------------------------------|------------------------|------------------------|--------------|------------------------|------------------------|--------------|
| | <80% | >80% | <i>P</i> | <80% | >80% | <i>P</i> |
| Seen more than one therapist | 1890 (69.21) | 333 (82.63) | 0.000 | 1540 (74.04) | 219 (81.11) | 0.012 |
| More than one treatment | 1266 (48.90) | 256 (64.00) | 0.000 | 1482 (72.33) | 223 (82.90) | 0.000 |
| Short education (10–12 years) | 601 (22.11) | 118 (29.80) | 0.001 | 472 (22.57) | 62 (24.41) | 0.510 |
| Gender respondents (women/men) | 58.01/41.99 | 51.59/48.41 | 0.000 | 42.36/57.64 | 43.41/56.59 | 0.414 |
| Mean age | 44.13 [43.95–44.31] | 46.35 [45.94–46.76] | s | 42.20 [42.00–42.20] | 43.13 [42.63–43.63] | s |

Note: Numbers (%); Statistical analyses with Chi Square 95%CI. Bold font shows $P < 0.05$.

Figure 1. Coping strategies at time of reporting an occupational injury stratified by gender.

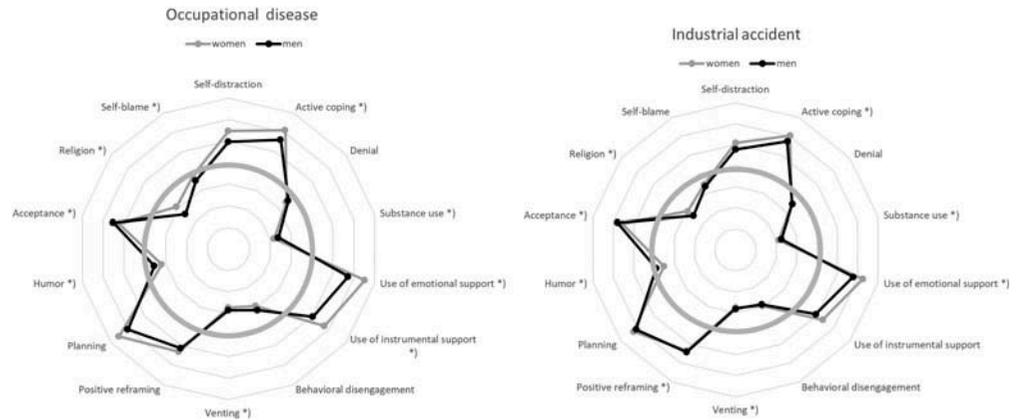


Table 2. Comparison of coping strategies of respondent claimants at time of reporting an occupational disease or industrial accident

| | Occupational disease | Industrial accident | P |
|-----------------------------|----------------------|---------------------|--------------|
| Self-distraction | 5.30 [5.24–5.36] | 4.93 [4.86–5.00] | 0.000 |
| Active coping | 5.93 [5.88–5.99] | 5.88 [5.82–5.94] | 0.010 |
| Denial | 3.50 [3.45–3.55] | 3.47 [3.41–3.53] | 0.304 |
| Substance use | 2.26 [2.23–2.28] | 2.18 [2.15–2.21] | 0.015 |
| Use of emotional support | 6.26 [6.20–6.31] | 6.02 [5.96–6.09] | 0.241 |
| Use of instrumental support | 5.49 [5.43–5.55] | 5.14 [5.07–5.20] | 0.000 |
| Behavioral disengagement | 3.01 [2.96–3.06] | 2.93 [2.88–2.99] | 0.080 |
| Venting | 2.76 [2.72–2.80] | 2.78 [2.74–2.82] | 0.043 |
| Positive reframing | 5.25 [5.19–5.31] | 5.38 [5.31–5.44] | 0.079 |
| Planning | 6.34 [6.29–6.39] | 6.17 [6.11–6.23] | 0.160 |
| Humor | 3.31 [3.26–3.36] | 3.70 [3.63–3.77] | 0.000 |
| Acceptance | 5.33 [5.27–5.38] | 5.67 [5.60–5.73] | 0.000 |
| Religion | 2.98 [2.93–3.03] | 2.75 [2.70–2.81] | 0.000 |
| Self-blame | 3.69 [3.63–3.75] | 3.39 [3.33–3.46] | 0.012 |

Note 1: Mean, 95% CI; score index 2–8.

Note 2: P describes result of the multivariate logistic analyses incl. all coping strategies, severity of injury, education, gender, and age.

Figure 2. Coping strategies at time of reporting an occupational injury stratified by long-term disability benefits.

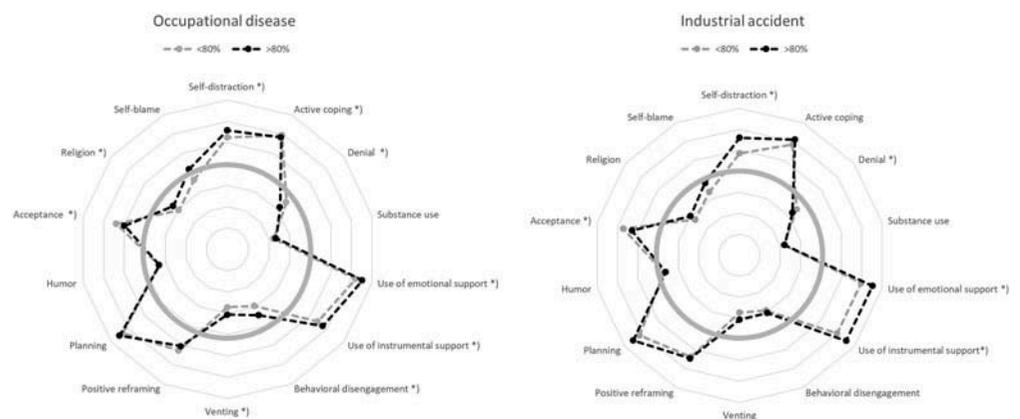


Table 3. Multivariate logistic regression analyses of coping strategies by long-term disability benefits

| | Occupational disease | Industrial accident |
|--------------------------------|-------------------------|-------------------------|
| Number of visited therapists | 1.19 [1.01–1.40] | 1.51 [1.25–1.81] |
| Number of different treatments | 1.17 [1.05–1.32] | 1.10 [0.97–1.25] |
| Self-distraction | 1.13 [1.02–1.24] | 1.21 [1.08–1.37] |
| Active coping | 0.85 [0.75–0.95] | 0.94 [0.82–1.08] |
| Denial | 0.78 [0.70–0.86] | 0.87 [0.76–0.99] |
| Substance use | 1.01 [0.87–1.17] | 1.00 [0.82–1.22] |
| Use of emotional support | 1.14 [1.02–1.28] | 1.17 [1.02–1.31] |
| Use of instrumental support | 1.06 [0.95–1.17] | 1.16 [1.02–1.31] |
| Behavioral disengagement | 1.18 [1.08–1.30] | 1.01 [0.90–1.14] |
| Venting | 1.08 [0.96–1.22] | 1.10 [0.94–1.29] |
| Positive reframing | 1.06 [0.95–1.17] | 1.06 [0.94–1.19] |
| Planning | 1.07 [0.94–1.20] | 1.02 [0.88–1.17] |
| Humor | 0.99 [0.90–1.08] | 0.92 [0.83–1.01] |
| Acceptance | 0.88 [0.80–0.97] | 0.86 [0.77–0.96] |
| Religion | 1.12 [1.03–1.21] | 1.06 [0.95–1.18] |
| Self-blame | 1.09 [1.00–1.81] | 1.07 [0.96–1.18] |
| Education | 0.84 [0.75–0.94] | 0.84 [0.73–0.98] |
| Gender | 1.29 [0.97–1.70] | 1.04 [0.75–1.43] |
| Age | 1.01 [1.00–1.03] | 1.00 [0.99–1.02] |

Note: OR 95%CI; bold figures show $P < 0.05$.

The multivariate analyses (Table 4A) demonstrates the used coping strategies of responders receiving long-term disability benefit stratified by decision of the National Board of Industrial Injuries. Claims with recognized disease only demonstrated significance in more use of self-distraction when receiving disability benefits. The differences in used coping strategies in ongoing claims were less use of self-distraction and emotional support if the claimants returned to work; use of acceptance was almost significantly associated with return to work. Active coping, acceptance, and less use of emotional support increased return to work in rejected occupational disease claims.

3.2. Industrial accident

The tendencies in coping strategies after reporting an industrial accident were in line with occupational disease, however active coping had no significant influence (Figure 2). There were no significant gender or age differences (not shown). In general, the coping strategies were used to a lesser extent than in occupational disease, except acceptance which were used to a greater extent (Table 2).

Table 3 showed the multivariate logistic regression analyses and the influence of health and social factors. No matter the severity of injury and the social influence the important used coping strategies still differed with self-distraction, use of support and acceptance as the most important.

The multivariate analyses (Table 4B) demonstrates the coping strategies of responders receiving long-term disability benefit stratified by decision of the National Board of Industrial Injuries. There were no differences in coping strategies in recognized claims. Acceptance and less use of self-distraction increased the likelihood of returning to work in ongoing claims. Likewise acceptance and less use of instrumental support increased the likelihood of returning to work in rejected claims.

Table 4. Coping strategies at time of reporting an occupational injury stratified by long-term disability benefit and decision from The National Board of Industrial Injuries

| | Recognized with financial compensation | | | Ongoing | | | Rejected | | |
|---------------------------------|--|------------------|--------------|------------------|------------------|--------------|------------------|------------------|--------------|
| | | P | | | P | | | P | |
| (A) Occupational disease | | | | | | | | | |
| | < 80% | > 80% | | < 80% | > 80% | | < 80% | > 80% | |
| Self-distraction | 4.45 [4.18-4.71] | 5.54 [5.05-6.03] | 0.012 | 4.89 [4.74-5.05] | 5.65 [5.38-5.91] | 0.017 | 5.44 [5.37-5.52] | 5.59 [5.40-5.77] | 0.089 |
| Active coping | 5.57 [5.34-5.79] | 5.33 [4.76-5.91] | 0.066 | 5.67 [5.54-5.81] | 5.96 [5.72-6.21] | 0.565 | 6.07 [6.01-6.14] | 5.83 [5.65-6.01] | 0.000 |
| Use of emotional support | 5.99 [5.76-6.22] | 5.96 [5.29-6.62] | 0.955 | 5.87 [5.73-6.01] | 6.63 [6.38-6.88] | 0.033 | 6.35 [6.28-6.42] | 6.59 [6.43-6.75] | 0.040 |
| Use of instrumental support | 5.17 [4.93-5.40] | 5.50 [4.86-6.14] | 0.702 | 5.11 [4.96-5.25] | 5.91 [5.61-6.21] | 0.223 | 5.59 [5.52-5.66] | 5.74 [5.55-5.92] | 0.465 |
| Positive reframing | 5.19 [4.94-5.44] | 4.65 [4.06-5.24] | 0.673 | 5.22 [5.08-5.36] | 5.11 [4.81-5.41] | 0.437 | 5.30 [5.22-5.37] | 5.07 [4.87-5.27] | 0.381 |
| Planning | 6.14 [5.89-6.38] | 6.30 [5.74-6.86] | 0.496 | 6.01 [5.88-6.14] | 6.56 [6.32-6.81] | 0.301 | 6.43 [6.37-6.49] | 6.48 [6.32-6.64] | 0.109 |
| Acceptance | 5.83 [5.59-6.06] | 4.91 [4.23-5.59] | 0.582 | 5.60 [5.46-5.73] | 5.13 [4.85-5.40] | 0.051 | 5.25 [5.18-5.32] | 4.94 [4.76-5.13] | 0.049 |
| B. Industrial accident | | | | | | | | | |
| Self-distraction | 4.79 [4.61-4.97] | 5.28 [4.75-5.80] | 0.352 | 5.06 [4.92-5.19] | 5.76 [5.51-6.01] | 0.001 | 4.87 [4.74-5.00] | 5.37 [5.01-5.73] | 0.215 |
| Active coping | 5.83 [5.68-5.98] | 5.95 [5.48-6.42] | 0.556 | 6.01 [5.89-6.12] | 6.15 [5.89-6.42] | 0.128 | 5.96 [5.85-6.07] | 6.07 [5.76-6.39] | 0.265 |
| Use of emotional support | 5.79 [5.62-5.95] | 6.40 [5.93-6.87] | 0.298 | 6.15 [6.02-6.27] | 6.60 [6.37-6.84] | 0.079 | 6.01 [5.89-6.13] | 6.44 [6.09-6.79] | 0.426 |
| Use of instrumental support | 5.04 [4.87-5.21] | 5.87 [5.43-6.31] | 0.058 | 5.20 [5.07-5.33] | 5.70 [5.42-5.98] | 0.821 | 5.13 [5.01-5.25] | 5.73 [5.40-6.05] | 0.008 |
| Positive reframing | 5.53 [5.35-5.70] | 5.56 [5.09-6.01] | 0.476 | 5.37 [5.25-5.50] | 5.65 [5.35-5.94] | 0.265 | 5.20 [5.07-5.32] | 5.12 [4.73-5.50] | 0.713 |
| Planning | 6.14 [5.99-6.29] | 6.48 [6.17-6.78] | 0.569 | 6.22 [6.11-6.34] | 6.61 [6.39-6.83] | 0.296 | 6.21 [6.10-6.32] | 6.38 [6.08-6.68] | 0.850 |
| Acceptance | 5.74 [5.58-5.90] | 5.46 [4.91-6.02] | 0.342 | 5.61 [5.49-5.73] | 5.36 [5.08-5.63] | 0.013 | 5.61 [5.49-5.73] | 5.03 [4.67-5.39] | 0.035 |

Note 1: Mean, 95%CI, score index 2-8.

Note 2: Disability benefits more than 80% in the subsequent year after report of injury.

Note 3: P demonstrates the results in multivariate logistic analyses incl. all coping strategies with mean 4+, severity of injury, education, gender, and age.

4. Discussion

In general, acceptance at time of report of an occupational injury increased responders' possibilities of returning to work, and use of self-distraction, and support decreased their possibilities of returning to work, no matter if they had reported an occupational disease or an industrial accident.

Coping strategies have been found to correlate with expectancy of recovery/disability, and passive coping seem to predict more disability (Den Boer et al., 2006; Ferrari & Russell, 2010). Our study was partly in line with these findings of coping strategies and disability or return to work. We found that asking for support correlated with disability; involving others in acting can be a kind of passive strategy. Acceptance of the injury may both lead to a positive expectancy of recovery or may be associated with a positive expectancy. It is known that positive recovery expectations are associated with faster return rate and improvement in functional outcomes (Cole et al., 2002; Mondloch, Cole, & Frank, 2001). We suppose that acceptance to some extent may reflect positive recovery expectations, and if so, our results may be in line with studies on expectance and recovery.

Gender differences in coping strategies are mostly described with only few minor differences (Orzechowska, Zajęczkowska, Talarowska, & Gałecki, 2013; Phillips et al., 2012). We found that women had a greater tendency to use active coping, emotional and instrumental support, and a less tendency of acceptance of the injury. These coping strategies may prolong return to work. However, we did not in general find that gender differences in return rate to work.

An industrial accident is an incident or exposure that occurs suddenly or within few days whereas an occupational disease may have been present for a relatively long time. We found some differences in coping strategies, however, we found no important differences in coping strategies and long-term benefits whether the responders had reported an occupational disease or and industrial accident. The beneficial or adequate strategy for returning to work at time of reporting an occupational injury seemed to differ according to later decision with no specific recommendable pattern, except the beneficial in acceptance and partly active coping. We have looked only at the coping patterns generally, in consideration of sufficient numbers in the categories, and we do not know if coping strategies may differ according to type of injury. However, we were able to adjust for severity of injury, which presumably is of greater importance.

The strength of this follow-up study is the uniform data collection at baseline and the complete follow-up according to disability benefits and decision by the National Board of Industrial Injuries. The response rate was only 16.54% and 21.0% for reports of industrial accidents and occupational disease, respectively. The responders were a few years older and predominantly women. All relevant multivariate analyses therefore included age and gender. We were not able to look at ethnicity, however, a small but increasing proportion (2005: 4%) of occupational injury reports were from immigrants. We do not know if or how this could influence the results. The multivariate analyses were likewise adjusted for severity of injury and social factors (education), which both as expected had influence on return to work. There were no significant differences between responders' and non-responders' long-term disability benefits and decision by the National Board of Industrial Injuries. Therefore, our data were not biased regarding benefits or decisions by the National Board. As our data provide only minor information about the non-responders, the findings should, however, only be generalized with care. Our data provide, however, valuable knowledge about the respondent claimants' coping strategies according to the injury associated with work possibilities.

5. Conclusion

Respondent claimants who at time of report accepted the injury and their situation had increased possibilities of returning to work in the subsequent year. Contrarily, responders coping by use of self-distraction, and support had increased risk of long-term disability benefits.

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Competing Interest

The authors declare no competing interest.

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