Stressful work, sickness absence and turnover in truck drivers from etiology to prevention

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Chapter 8

General discussion
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This chapter summarizes the theoretical and practical implications of the research findings as well as considerations regarding the methods applied in this thesis. First, the theoretical implications, categorized according to the primary questions and subordinate aims of this research, are described. Thereafter, the methodological considerations are presented. Finally, the conclusions are summarized and preventive measures are suggested.

Theoretical implications

1. To what extent are stressful working conditions in truck drivers predictive of sickness absence and turnover?

In view of the available evidence from multi-occupation and single-occupation research, it was expected that stressful working conditions were predictive of sickness absence of long duration and turnover in truck drivers. The prospective significant relations between the occupation-specific stressful working conditions and employee turnover confirmed this expectation (Chapter 5). However, contrary to the hypothesis, and in spite of the application of occupation-specific job demands, the stressful working conditions included in this study were not predictive of future general sickness absence for more than 14 working days (Chapter 4). These results contrast North et al. (1996), Vahtera et al. (2000), and De Lange et al. (2002) who demonstrated significant relations between the exposure to stressful working conditions on the one hand and sickness absence duration or increased risks of long spells of sickness absence on the other hand.

North et al. (1996) in the Whitehall II study (occupation heterogeneous London sample) showed that high job control and high social support at work were protective for spells of long term sickness absence (> 7 days) in male workers. When the analyses were adjusted for grade of employment the significant effects, however, were no longer present. Vahtera et al. (2000) showed in an occupation-heterogeneous sample of initially healthy Finnish workers that lowered job control caused a 1.30 times higher risk of sickness absence spells of more than 3 days than an increase in job control. An increase in psychological job demands was associated with a 1.10 times higher risk of sickness absence. Finally, De Lange et al. (2002) found a cross-sectional correlation of $r = -.11$ between job control and sickness absence duration in a Dutch occupation-heterogeneous sample. They further showed that sickness absence duration during the three year follow-up averaged 37 days
among the high strain workers (low control, high demands) and averaged 19 days in the low strain workers (high control, low demands). Contrary to the research hypothesis, however, sickness absence duration in the high strain workers did not increase over time.

Two conclusions can be drawn from the results of the studies described above. Firstly, the studies differed with respect to methodological features such as the chosen study population, sickness absence outcome, and time frame. Secondly, in spite of these differences, the effect sizes of stressful working conditions on sickness absence are small in all studies. In fact, the observed sizes found in the studies described above do not differ from the effect sizes observed in this thesis or are even smaller. These studies, however, were conducted in larger occupation-heterogeneous samples because of which the statistical power was higher in these studies as well. The small effects of the occupation-specific stressful working conditions on turnover in truck drivers (Chapter 5) are consistent as well with the effect sizes observed in other studies (Griffeth et al., 2000).

The significant, but small effects observed in this thesis confirm the notion that the development of health conditions, resulting in long-term sickness absence (or turnover), is complex and determined by numerous factors besides stressful working conditions (Zapf et al., 1996). Furthermore, this thesis showed in an evident manner that the baseline health status of truck drivers, expressed as long-term sickness absence, was a strong predictor of long-term sickness absence at follow-up (Chapter 4). The prospective effect of sickness absence on sickness absence was independent of age, stressful working conditions and need for recovery after work. This finding is in agreement with Smulders and Nijhuis (1999) and Alexopoulos and Burdorf (2000). These researchers showed that the best predictor of sickness absence in the future is sickness absence in the past. Similarly, studies examining the longitudinal relationship between working conditions and the development of psychological or musculoskeletal health complaints or conditions have demonstrated that complaints or conditions in the past are strong predictors of complaints or conditions in the future. The temporal (ill) health stability among the truck drivers in this study suggests that the health of these workers, in general, can be influenced by stressful working conditions to a restricted degree only.

The present findings suggest that information about occupation-specific stressful working conditions in truck drivers have limited value when explaining long-term sickness absence and turnover. However, caution is warranted when drawing this conclusion. Firstly, the explanatory value of (occupation-specific) stressful working conditions regarding sickness absence may improve when diagnosis-specific sickness absence is targeted. For instance,
the support for an association between stressful working conditions and musculoskeletal complaints-related sickness absence seems more convincing (e.g. Hemingway et al., 1997; Van Poppel et al., 1998; Tubach et al., 2002; Ariëns et al., 2002). Tubach et al. (2002) demonstrated in an occupation-heterogeneous cohort that low social support at work and low decision latitude were associated with a 3.4 and 3.1 times higher risk of low back pain-related sickness absence (>8 days), respectively. Correspondingly, Ariëns et al. (2002) found in an occupation-heterogeneous population that high psychological job demands and low job control were associated with a 2.4 and 4.4 times higher risk for future neck pain-related sickness absence (>3 days), respectively.

In Chapter 7 (validation of the TSM), this thesis showed that low job control and high psychological job demands were predictive of future prolonged sickness absence because of psychological health complaints. In terms of odds ratio’s, the observed correlation between job control and sickness absence (\( r = -.12 \)) indicates that drivers in the lowest job control tertile have a 1.9 times higher risk to drop out because of psychological complaints compared to drivers in the highest job control tertile. The correlation between psychological job demands and sickness absence (\( r = .15 \)) indicates that drivers in the highest demands tertile have a 2.2 times higher risk of absence due to psychological complaints than the drivers in the lowest demands tertile. Thus, differentiating between sickness absence diagnoses seems to result in a more precise picture of the relationship between stressful working conditions and sickness absence.

Secondly, for particular workers, stressful working conditions may have a stronger influence on turnover and sickness absence (due to certain health complaints) than for other workers. For instance, Kivimäki et al. (2002) showed that hostile workers (i.e. high proneness to anger, irritability and argumentativeness) had an increased chance to drop out from work because of sickness than non-hostile workers. As described previously, Barrick and Mount (1996) showed that, compared to their coworkers, emotionally unstable truck drivers were more likely to turnover. One explanation for these relationships is that hostile and emotionally unstable individuals/drivers have more problems in coping with the stressful working conditions. This may result in heightened cardiovascular and/or neuro-endocrine responses and, consequently, an increased risk of sickness absence and turnover. Thus, information about stressful working conditions combined with information about individual characteristics may enhance the predictive value of these conditions regarding turnover and sickness absence in truck drivers.

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The significant effect of psychological job demands and job control on sickness absence due to psychological health complaints was observed also when examined exclusively in the drivers who did not change jobs.
Thirdly, the combined exposure to different (occupation-specific) stressful working conditions may increase the risk of future sickness absence. For instance, Vahtera et al. (2000) demonstrated that low levels of job control were associated with increased risks of sickness absence in particular when the level of social support over time decreased. In like manner, Griffeth et al. (2000) evidenced that the effect sizes of work-related employee turnover determinants varied widely across different situations and populations. These findings suggest that paying attention to the dynamics (moderators and interactions) of (occupation-specific) stressful working conditions is likely to improve the predictability of sickness absence and turnover.

2. Does need for recovery after work play an intervening role in the presumed relationship between stressful working conditions on the one hand and sickness absence and turnover in truck drivers on the other hand?

The number of epidemiological (prospective) studies examining stressful working conditions as a risk factor for psychological and musculoskeletal health complaints has increased over the last decade. However, few epidemiological studies addressed the question on why or how work factors influence health. The present research examined one potential pathway through which stressful working conditions may affect worker health. Specifically, we examined the experienced need for recovery after work as an intervening variable in the relationship between stressful working conditions on the one hand and sickness absence and turnover on the other hand. In accordance with the hypothesis, need for recovery after work (i.e. an indicator of work-related fatigue) was predictive of long-term sickness absence (due to psychological health complaints) and, to a smaller degree, voluntary turnover in truck drivers (Chapter 5). Also consistent with the hypothesis, need for recovery mediated the relationship between stressful working conditions and employee turnover. Additional analyses, showed that need for recovery mediates the relation between stressful working conditions and long-term sickness absence due to psychological health complaints as well (data not shown in this thesis). However, the results of this thesis did not support the hypothesis that need for recovery after work mediates the relationship between stressful working conditions and general long-term sickness absence.
Chapter 8 General discussion

From general work stress research to (occupation) specific work stress research

The theoretical implications of the studies described in this thesis, that were conducted with the aim to (1) validate an occupation-specific Job Demand-Control model and (2) develop and validate a 10-item occupation-specific psychological job strain questionnaire, are described below.

1. Validation of an occupation-specific Job Demand-Control model

Chapter 3 showed that the inclusion of job demands that are specific for truck driving improved the predictive power of the JD-C Model with respect to the concurrently experienced fatigue and job dissatisfaction. Hence, this study underscored the importance to assess occupation-specific stressful working conditions comprehensively and accurately when predicting worker health. Recently, Sluiter et al. (in press) provided further support for the plea for an occupation-specific approach when examining the relationship between stressful working conditions and health. These researchers examined cross-sectionally and longitudinally the relationship between stressful working conditions, need for recovery after work, health complaints and sickness absence in six occupations, including the present cohort of truck drivers. The results of this study are described in the Appendix. Sluiter et al. (in press) clearly showed significant and substantial differences in the level of stressful working conditions between the six occupational cohorts. Moreover, the strength of the relationships between the stressful working conditions, need for recovery after work and health differed meaningfully between the six occupational cohorts. In accordance with the present research, the researchers concluded that caution is required when interpreting results of occupation-heterogeneous research. Preferably, in occupation-heterogeneous studies, researchers should stratify the analyses according to occupation.

The results of the present research and Sluiter et al. (in press) are in conjunction with the general tendency towards the development of more complex occupational stress models by generating and highlighting more occupation-specific stressors (Cooper, 1998). This trend is exemplified by the Job Demands-Resources Model of Burnout (Demerouti et al., 2001). According to the Job Demands-Resources Model of Burnout several (occupation-) specific job demands (e.g. recipient contacts, time pressure) and several (occupation-) specific job resources (e.g. feedback, job security) should be considered to understand the development of burnout. The movement towards more occupation-specific work stress research is manifested as well in the increasing number of occupation-specific work stress questionnaires.
2. Development and validation of the Trucker Strain Monitor (TSM)

Psychological (job) strain questionnaires applied in occupational stress research have seldom been developed and validated in a specific working population for the appliance in that specific working population. Contrarily, most of these questionnaires have been developed and validated in clinical populations for the use in these kinds of populations. Because of its presumed advantageous user-friendliness, reliability and (face) validity, a 10-item occupation-specific questionnaire to assess psychological job strain in truck drivers was developed. The results of the studies described in Chapter 6 and Chapter 7 evidenced high internal consistency, satisfactory test-retest reliability, and good construct and criterion validity of the TSM. These findings suggest that the application of occupation-specific psychological job strain questionnaires may give occupational stress researchers improved insight into the relationship between stressful working conditions and early indicators of psychological health conditions and coinciding sickness absence. Moreover, the use of occupation-specific psychological job strain questionnaires may point out the presence of stressful working conditions in groups of workers (e.g. company or department level) and may assist practitioners to take efficient preventive action at the appropriate time in individual workers.

Methodological considerations

Five methodological features of this research should be considered when appreciating the findings of the studies described in this thesis. These aspects are: (1) the composition of the study sample, (2) the time frame, (3) the full panel design, (4) the use of self-reports to assess stressful working conditions and (5) the use of self-reports to assess sickness absence.

1. The composition of the study sample
The sample for the present research was taken at random from the directory of the Dutch Central Bureau of Occupational Health Care in Road Transport (BGZ Wegvervoer). At that time, the BGZ Wegvervoer directory comprised about 5,000 road transport companies with approximately 100,000 employees of whom the majority is truck driver. Consequently, it can be stated with good reason that the study sample was representative of the entire population of Dutch truck drivers. Moreover, presumably due to the representativeness of the study sample, the variation of exposure to the stressful working conditions was large. In fact, the variation in stressful working conditions in the
study sample was comparable to the variation of these conditions in a representative sample of the Dutch working population. On the other hand, the variation in social economic status (occupation, education, income), which may act as a confounder in occupational stress and health research, was small in this study population. Thus, the composition of the study sample is a strong aspect of this thesis.

As noted previously, the drivers who did not respond at follow-up were on average somewhat, but significantly younger and more often single compared to the respondents at follow-up. With respect to the main variables under study, however, no significant differences between non-respondents and respondents at follow-up were observed. Because no information about the truck drivers who did not participate at baseline was available, selection bias at baseline could not be examined. Using a similar design, Van der Beek et al. (1993) conducted a cross-sectional questionnaire study in Dutch truck drivers to assess the workload of these workers. The researchers performed a telephone investigation to find out whether the response group differed in any way (e.g. age, height, hindrance due to working conditions, difficulty with activities and musculoskeletal complaints) from the non-response group. With the exception of height, the non-response telephone investigation did not reveal significant differences between the respondents and non-respondents. Although, we cannot rule out baseline selection bias, the results of Van der Beek et al. (1993) and the non-appearance of baseline differences between non-respondents and respondents at follow-up in this research suggest that this bias is unlikely.

2. The time frame
As noted by Frese and Zapf (1988), the knowledge about the time frame that is needed for stressful working conditions to progress the transition from harmless health complaints to more invalidating health conditions and coinciding sickness absence, is scarce. Based on the available research that examined the relationship between stressful working conditions on the one hand and sickness absence and turnover on the other hand, a length of two years was chosen. Possibly, the stressful working conditions needed more time to "wear and tear" on the truck drivers. However, because of loss to follow-up, employee turnover and the use of self-reports to quantify sickness absence (recall bias), a longer follow-up period was impracticable. Furthermore, it should be noted that a longer time frame would have negatively affected the stability of the stressful working conditions in the dynamic road transport industry. Consequently, the influence of stressful working conditions on sickness absence and turnover might have become more difficult to demonstrate.

126
3. The full panel design
To get insight into the relation between stressful working conditions, sickness absence and employee turnover, a full panel design (i.e. both independent and dependent variables were measured at baseline and follow-up) was used. Consequently, we could demonstrate the relationship between stressful working conditions at baseline and the subsequent occurrence of the outcomes during the second year of the 2-year follow-up period. Secondly, by controlling for the dependent variables (long term sickness absence and organizational tenure as a proxy for previous turnover) at baseline, we could rule out the influence of stable third variables that may explain the observed relationship. Thirdly, the full panel design allowed us to show the stability of the stressful working conditions in the drivers who did not change jobs and the instability of these conditions in the drivers who changed jobs during the follow-up period. Thus, the full panel design used in this study is considered a strong aspect of this thesis also.

4. The use of self-reports to assess stressful working conditions
Validated self-reported questionnaires were used in the present research to measure stressful working conditions (Van Veldhoven, 1996). Some researchers question the usefulness of self-reported questionnaires in this respect because they may not give a true picture of the actual or "objective" working conditions (e.g. Schaubroek, 1999). However, as noted by Frese and Zapf (1988) self-reported stressful working conditions can be conceived as objective in the sense of being more or less dependent on the specific individual’s cognitions and emotions. For instance, the question "What is the average number of working hours?" is more objective than the question "How chaotic or exciting is your work?" because the latter question involves emotional processing. To optimize the "objectivity" of the self-report data, therefore, the present research used descriptive items and descriptive frequency answering formats to quantify the stressful working conditions.

Another issue regarding the use of self-reports to assess stressful working conditions relates to the presumed disposition of negative affectivity (NA). According to Watson and Pennebaker (1989), workers with high NA perceive their work environment more negatively, thereby creating spurious associations between stressful working conditions and self-reported health complaints, the latter being also positively influenced by negative affectivity. Consistent with this hypothesis, several researchers have demonstrated correlations between negative affectivity on the one hand and self-reported stressful working conditions and health complaints on the other hand. Accordingly, these
researchers recommend to statistically control for NA when examining the relation between stressful working conditions and health complaints. Because research shows that, for several reasons (see for an overview Spector et al., 2000), statistically controlling for NA results in losing true variance from the stress-health relation, however, NA was not controlled for in the present thesis.

5. The use of self-reports to assess sickness absence
Several measures of sickness absence such as frequency, duration, incidence rates, and cumulative incidence can be used as an outcome in occupational stress research (Hensing et al., 1998). Sickness absence of more than 14 days was the outcome measure in this thesis because research has demonstrated clearly that long spells of sickness absence are indicative of the seriousness of health complaints in the working population. To quantify this sickness absence outcome, the drivers were asked to indicate the number of working days with sickness absence during the previous 12 months (1-7 working days, 8-14 working days, more than 14 working days). Although these data are informative about the total sickness absence duration, they do not give information about the sickness absence spells or on their duration. To get some insight into the duration-frequency sickness absence ratio, the drivers in this study were also asked to indicate the number of sickness absence spells during the previous 12 months. The number of sickness absence spells during the previous 12 months was one for 58 percent of the drivers with sickness absence of more than 14 working days and ranged between two and five for 38 percent of the drivers with sickness absence of more than 14 working days. The average number of sickness absence days in the group of drivers with sickness absence of more than 14 working days, was 50 (two thirds were absent for more than four weeks). These figures indicate that both the total sickness absence duration and the duration of the separate sickness absence spells for the drivers with absence for more than 14 working days was comparatively long.

The reliability of self-reported sickness absence questionnaires is sometimes questioned. Workers may not remember the duration, frequency or reason of sickness absence or the use of self-reports in occupational stress research may introduce common method variance. To get a clearer picture of the reliability of self-reported sickness absence data, studies on this topic by Agius et al. (1994), Burdorf et al. (1996), Fredriksson et al. (1998) and Severens et al. (2000) were consulted.

In the study by Agius et al. (1994) coal mine workers were asked to indicate on a self-report questionnaire whether they had been absent from work because of back pain during
the past 12 months. Agius and colleagues compared the self-reported data with registered sickness absence data and evidenced a sensitivity of 88 percent and specificity of 84 percent of the questionnaire.

Burdorf et al. (1996) compared self-reported sickness absence data with registered sickness absence data covering a 6 months period among Dutch workers in an animal feed factory. The researchers demonstrated a sensitivity of 79 percent and a specificity of 91 percent when registered frequency and duration of sickness absence was the external criterion. Burdorf and colleagues observed even higher sensitivity and specificity rates when duration and frequency of diagnosis-specific sickness absence was the external criterion.

Fredriksson et al. (1998) inspected the reliability and validity of a self-reported sickness absence questionnaire in an occupation-heterogeneous sample. Fredriksson and colleagues evidenced a high test-retest reliability of the questionnaire containing questions on sickness absence due to musculoskeletal diseases over the previous 12 years (Cohen’s kappa = .93). Moreover, when the self-reported data were compared with registered sickness absence data over a 4-year period a high percentage of agreement was observed. Depending on the level of concordance (e.g. duration of sickness absence, specific diagnosis), the percentage of agreement ranged between 89% and 97%.

Finally, Severens et al. (2000) examined the precision and accuracy of self-reported sickness absence data in Dutch pharmaceutical employees and found that the precision of self-report sickness absence data increased when a shorter recall period was used. The percentage of agreement between registered and self-report data covering 12 months was 78 percent when a margin of 3 days difference between registered and self-reported data was accepted. The percentage of agreement even approached 100 percent when a margin of 8 days difference was accepted.

If registered sickness absence data are completely reliable (which may be questioned by itself), the results of the studies described above indicate that self-reported sickness absence data do not give a perfect representation of the workers’ actual sickness absence history. However, the results clearly indicate that the self-reported sickness absence data of the present study covering a 12-month period are sufficiently accurate to be used as an estimate for the worker’s actual sickness absence history.
Chapter 8 General discussion

Conclusions

The primary hypotheses of this thesis were that (1) the chronic exposure to stressful working conditions would result in prolonged sickness absence from work and turnover in truck drivers and (2) stressful working conditions would result in sickness absence and turnover in truck drivers through increasing need for recovery after work. The results of the studies described in this thesis provided mixed support for these hypotheses. Specifically, regarding the first hypothesis, support was provided for the prospective relationship between stressful working conditions on the one hand and long-term sickness absence due to psychological health complaints and voluntary turnover on the other hand. However, the stressful working conditions did not convincingly predict diagnosis non-specific long-term sickness absence in truck drivers. Furthermore, the observed statistically significant effects of stressful working conditions on long-term sickness absence due to psychological health complaints and turnover were rather small casting doubt on their clinical significance.

With respect to the hypothesized intervening role of need for recovery after work, in-between stressful working conditions on the one hand and sickness absence and turnover on the other hand, this thesis provided more support. Firstly, all occupation-specific stressful working conditions showed strong and significant cross-sectional associations with need for recovery after work in truck drivers. Secondly, need for recovery after work was significantly, though moderately predictive of (1) long-term sickness absence in general, (2) long-term sickness absence due to psychological health complaints and (3) employee turnover. Thirdly, baseline need for recovery after work was found to mediate the relationship between baseline stressful working conditions on the one hand and sickness absence due to psychological health complaints and turnover on the other hand.

Taken together, this research on stressful working conditions, sickness absence and turnover in truck drivers provides further support for the proposal that (specific) stressful working conditions contribute to the occurrence of sickness absence and employee turnover through accumulated levels of work-related fatigue (i.e. need for recovery after work). At the same time, the small effects of (specific) stressful working conditions on the outcomes observed during this research confirm that turnover and sickness absence are multifactorial, complex phenomenons that, like several prevalent "subjective" musculoskeletal and psychological health conditions, cannot be explained by static, general, "mono-causal" epidemiological occupational stress and health models.
From etiology to prevention

This thesis was designed to gain insight into the relation between stressful working conditions on the one hand and sickness absence and turnover in truck drivers on the other hand with the underlying idea to translate this insight into preventive measures. Accordingly, underneath, the findings of this thesis are translated into preventive measures at the primary, secondary and tertiary level.

Primary prevention
De Croon et al. (2000a; 2001a) described measures that may reduce stressful work in truck drivers. Based on the present results that showed that psychological job demands and job control were predictive of both sickness absence due to psychological health complaints and employee turnover, primary preventive measures should be directed at these working conditions in particular. With respect to measures aimed at decreasing the psychological job demands of truck drivers, companies in the road transport industry are encouraged to reduce the number of working hours. Road transport companies, for instance, may prohibit drivers to work more than 55 hours per week. The percentage of drivers with high need for recovery after work is found to increase rather sharply beyond this number of working hours (De Croon et al., 2000a). To promote job control in truck drivers, companies in the road transport industry may consider the introduction of self-regulating (autonomous) teams in which drivers attain more opportunities to organize work themselves (e.g. planning of the routes, holidays).

This thesis showed that supervisor job demands and physical job demands were predictive of employee turnover through elevating the need for recovery after work in truck drivers. Cross-sectionally, these work characteristics were found to be associated to the experienced fatigue, need for recovery after work and job dissatisfaction. As such, these work features may, indirectly, be related to other relevant organizational outcomes such as productivity and sickness absence. Accordingly, reduction of these job demands, may, indirectly, promote the health status of both truck drivers and road transport companies. Companies in the road transport industry may optimize supervisor job demands by improvement of the social and communication skills of their transportation managers. For instance, these companies may give their managers the opportunity to attend courses aimed at improving social and communication skills that are developed especially for these managers by order of the Central Bureau of Occupational Health Care in Road Transport (BGZ Wegvervoer).
Primary preventive measures aimed at reducing the physical job demands of truck drivers include the use of electric pallet-trucks and the use of electric rolling floors inside the truck. Furthermore, the employment of warehouse workers to assist truck drivers in (un)loading the truck may also decrease the physical job demands as well as the psychological job demands of these workers. Likewise, an efficient attunement between transportation companies and consignors regarding, for instance, the use of similar pallets and the allocation of (un)loading activities may result in decreased physical job demands (and time pressure) for truck drivers also.

At the level of the branch, the Central Bureau of Occupational Health Care in Road Transport (BGZ Wegvervoer) is encouraged to inform companies in the road transport industry about the presumed advantages of organizational stress reducing interventions and should stimulate and support these companies when they want to implement and evaluate these measures.

Secondary prevention
As noted previously, the observed effects of stressful working conditions on sickness absence and turnover suggest that primary prevention alone will not result in large health improvements in truck drivers. Moreover, some external conditions (e.g. traffic jams, bad weather conditions) potentially resulting in stress are not modifiable. Preventive measures directed at the truck driver himself (primary and secondary prevention), therefore, are recommended also.

The Trucker Strain Monitor (TSM) as well as the occupation-specific work stress model used in this thesis may, partly, offer the basis for the plan of these preventive measures. Specifically, truck drivers with elevated psychological job strain (at an elevated risk of sickness absence) may be identified with the TSM. Subsequently, these drivers may be offered a stress management course aimed at the acquisition of skills to cope with the stressful working conditions that are specific for truck driving. For instance, coping with high psychological job demands due to the confrontation with traffic jams requires emotion-focused coping (relativizing and relaxation), whereas dealing with high physical job demands due to the absence of good handling equipment at the customer requires active coping and social skills. In the case of high psychological job demands due to a problematic relationship with the transportation manager (supervisor job demands), some drivers have to learn to deal with these situations in an appropriate assertive manner.
At the level of the branch, the Central Bureau of Occupational Health Care in Road Transport (BGZ Wegvervoer) may consider conducting educational campaigns with the purpose to inform truck drivers about chronic recovery complaints as early indicators of more serious health conditions.

Tertiary prevention
In the Netherlands, the occupational physician plays a central role in the rehabilitation of truck drivers with prolonged sickness absence due to psychological health complaints. In 2000, the Dutch Association for Occupational and Industrial Medicine (NVAB) published practice guidelines for the rehabilitation of workers with sickness absence due to these complaints. The guidelines prescribe a problem-directed rehabilitation. For this purpose, the occupational physician should, among other things, assess the possible work-related causes of sickness absence due to psychological health complaints. Based on the results of this thesis, the occupational physicians in the road transport industry are commended to pay attention to the driver’s (1) psychological job demands (e.g. time pressure, work quantity), (2) job control (e.g. influence on planning and time required to complete the work), and (3) opportunities to recover after work. Furthermore, the occupational physician should consider whether these conditions may hinder the return to work of the driver. On the basis of this information the physician may ask the employer to adjust the tasks or workload of the driver. Finally, in view of the present finding, which shows that prolonged sickness absence in the past is a powerful and independent predictor of prolonged sickness absence in the future, the occupational physician, the employer as well as the employee himself should be aware in particular of early signs of recurrences.

Further research

Work stress intervention research
As noted previously, this epidemiological research was conducted with the underlying idea to propose measures aimed at preventing the deterioration of health, sickness absence and turnover in truck drivers. Accordingly, several preventive measures have been described in this chapter. Obviously, the next step would be to evaluate the effect as well as the implementation of the recommended preventive measures in (quasi) experimental studies. After all, only these studies can tell us whether the implementation of (the combination of) primary and secondary preventive measures are (cost)-effective. Moreover, (quasi) experimental studies can contribute to a better understanding of the influence of stressful working conditions on the deterioration of health (in truck drivers).
Epidemiological work stress research

Also needed for a greater understanding of the detrimental influence of stressful working is longitudinal research that includes several precisely defined occupation-specific job demands and job resources and precisely defined health, sickness absence and/or turnover outcomes. In a like manner, longitudinal research is required that pays attention to variables that may moderate (enlarge or suppress) the influence of stressful working conditions on the deterioration of health. Presumably, the relationship between stressful working conditions, health complaints, sickness absence and turnover will not only vary across occupations (occupation-specificity of the stress-health relation), but will also vary across different subgroups of workers (e.g., age, tenure, personality differences, behavioral styles) within a single occupation. Finally, more epidemiological work stress research is required that looks into the potential psychological and psycho-physiological mechanisms that underlie the influence of stressful working conditions on the workers' health deterioration.