

University of Groningen

Frequent sickness absence, a signal to take action

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Document Version

Publisher's PDF, also known as Version of record

Publication date:

2019

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Notenbomer, A. (2019). *Frequent sickness absence, a signal to take action: a signal to take action*. Rijksuniversiteit Groningen.

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CHAPTER

General discussion

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General discussion

This thesis aims to increase scientific knowledge on frequent SA. This general discussion summarizes and discusses the main findings of the thesis and the methodological considerations. In addition, recommendations for occupational health practice, management and future research are presented.

The thesis had three specific aims: The first aim was to examine the factors associated with frequent SA. The second aim was to investigate which employees with frequent SA will develop long-term SA in the future. The third aim was to evaluate an e-health intervention to reduce SA frequency among employees with frequent SA.

Main findings

Aim 1. Factors associated with frequent sickness absence

Research question 1: Which factors are related to frequent sickness absence? (chapter 2)

In a study with three focus groups, employees with prior frequent SA were encouraged to discuss their awareness of frequent SA, factors related to frequent SA, solutions to reduce frequent SA and the high risk of developing long-term SA within 4 years. Many participants were not aware that they had frequent SA, and most did not consider themselves at risk of future long-term SA. Factors related to frequent SA were high job demands, low job resources, high home demands, poor health, chronic illness, unhealthy lifestyles, and diminished feelings of responsibility to attend work, particularly in case of poor support from management. Among solutions to reduce frequent SA, participants emphasized addressing the above factors themselves, and sometimes jointly with the employer; they also mentioned improving their own communication skills.

Research question 2: Is work ability associated with both frequent and long-term sickness absence? (chapter 3)

In a cross-sectional study, we examined associations of work ability scores with self-rated SA, differentiating between frequent SA (≥ 3 SA spells lasting < 2 weeks in the prior year), long-term SA (≥ 1 SA spell of ≥ 2 weeks in the prior year), and combined (frequent and long-term) SA. Mean (standard deviation) work ability scores were 41.2 (3.4), 39.4 (3.9) and 37.2 (5.2) in employees with frequent SA, long-term SA, and combined SA, respectively, as compared to 43.2 (2.7) in a reference group of employees without frequent or long-term SA. Work ability scores were negatively related to frequent SA (odds ratio [OR] = 0.85; 95% confidence interval [CI] 0.82–0.88),

long-term SA (OR = 0.79; 95% CI 0.75–0.82) and combined SA (OR = 0.74; 95% CI 0.71–0.77) compared to the reference group.

Aim 2. Factors associated with future long-term SA among employees with frequent sickness absence

Research question 3: Which factors are associated with future long-term sickness absence among employees with frequent sickness absence? (chapter 4)

In a systematic review, we found only four moderate-good quality studies on factors associated with long-term SA among frequent absentees. Although long-term SA among frequent absentees was not the main subject of interest, the articles presented SA data for subgroups of employees including frequent absentees. Within this group we found indications that older age and female gender may be associated with long-term SA. No clear relation existed between SA pattern (i.e. frequent SA with only short-term spells versus frequent SA including at least one long-term spell) and future long-term SA. Other variables (total sick leave days, marital status, socioeconomic position, urban/rural workplace, seniority, fulltime/part-time employment, occupation, work factors and health care characteristics) were only included as co-variables in these articles. Therefore, we were not able to study the potential associations of these variables with future long-term SA among frequent absentees.

Research question 4: Can we discriminate frequent absentees at risk for long-term SA from frequent absentees who are not at risk of long-term sickness absence? (chapter 5)

In a prediction modeling study, occupational health survey data from employees with registered frequent SA in the year prior to the survey, were linked with registered SA data in the following year. The factors from the systematic review were included as potential predictor variables. We developed a first model with job demands and job resources and a second model with burnout and work engagement as predictor variables. The first final model included age, gender, education, marital status, prior long-term SA, work pace, role clarity and learning opportunities. This model significantly discriminated between frequent absentees with and without long-term SA (AUC=0.623; 95% CI 0.601 – 0.646). The second final model included age, gender, education, marital status, prior long-term SA, burnout and work engagement as predictor variables and also showed significant discrimination (AUC=0.624; 95% CI 0.596 – 0.651). In both models discrimination between frequent absentees with and without long-term SA during 1-year follow-up was insufficient for practice. Differentiating by gender or by sickness absence cause did not result in better discrimination.

Aim 3. Towards the prevention of future sickness absence among employees with frequent sickness absence (chapter 6)

Research question 5: Is a new e-health intervention tool effective in reducing sickness absence frequency among employees with frequent sickness absence?

In a randomized controlled trial we evaluated the effectiveness of a novel e-health (EHI) tool in three groups: an e-health intervention group with online feedback and advice only (EHI-only), a blended-care group combining the e-health intervention and a consultation with an occupational physician (EHI-OP), and a control group receiving care as usual. Outcomes of the study were SA frequency, total number of SA days, burnout, engagement and work ability at 1-year follow-up. The e-health intervention consisted of immediate, fully automated personalized online feedback upon completion of the baseline questionnaire, including the scores on the various scales, how to interpret these scores and an advice to take action where appropriate. We found no significant difference in SA frequency between the intervention groups and the control group at 1-year follow-up. The frequency of SA decreased in all groups, including the control group. We also found no significant difference in the secondary outcome measures: total number of SA days, burnout, work engagement, and work ability. Because of insufficient adherence to the OP consultation we did not evaluate the effect of blended care, i.e. the combination of the EHI-tool with an OP consultation (EHI-OP).

Reflections on main findings

The first section focuses on the motivational process in the relation between job resources and frequent SA. The second section reflects on factors playing a role for an employee with frequent SA to develop long-term SA. The third section presents considerations on how to prevent future SA among employees with frequent SA.

Frequent sickness absence, motivation and the role of job resources

In Dutch practice and in the scientific literature frequent SA is often associated with poor motivation [1,2]. In the Netherlands, occupational health professionals and managers in organizations often apply the saying 'Sick is sick, but sickness absence is a choice' to employees with frequent SA. This saying suggests that the employees lack motivation to attend work. In line with this thinking, Schaufeli et al., in a study investigating the JD-R model, referred to SA frequency as 'voluntary SA' [1]. This model stipulates that decreasing job resources may reduce an employee's motivation to work (the motivational process). The focus group study indeed showed some indications for a relation between diminished motivation and frequent SA. Some

participants stated that low job resources (poor support, problems with manager, no respect, excel sheet management) led to a diminished feeling of responsibility and a lower barrier to call in sick when not feeling well. They described a process of gradual loss of motivation for a job with low job resources. They also stated that appreciation and respect from their manager would help them to show up at work when not feeling well. Appreciation and respect are examples of job resources, which may lead to lower SA by attenuating the adverse effects of high job demands and by increasing work engagement [1]. However, low job resources may be sensitive issues for an employee to discuss with the employer. Moreover, an open dialogue among all involved stakeholders requires good communication skills.

What tempts managers and OHS professionals to focus on an employee's motivation in case of frequent SA and frequent absentees to view frequent SA as a temporary, not very important, issue? First, the majority of employees with frequent SA have only relatively short SA spells [3], and suffer minor morbidities [4]. The relatively mild nature of many short SA spells [4] allows for a certain amount of latitude to call in sick. Several models have alluded to this latitude to call in sick, such as the decision making model [5], the model of planned behavior [6], and the illness flexibility model [7]. In the illness flexibility model, Johansson and Lundberg describe how the possibility to adjust work and attendance requirements affects calling in sick when one feels ill [7]. This decision latitude to call in sick fuels the idea that frequent SA is a motivational issue. Second, we found that many frequent absentees themselves were not aware of the high risk of future SA, and looked upon their SA as past and only temporary. The majority of the focus group participants did not believe that they would develop long-term SA within four years. Third, some frequent absentees expressed disappointment with their management, which indeed made them less motivated to go to work. Fourth, many managers of the frequent absentees participating in the focus group- and intervention studies also did not seem to consider frequent SA a problem, and did not discuss frequent SA and its underlying reasons with their employees. Psychological mechanisms may also play a role; regarding frequent SA as a lack of motivation places all responsibility on the frequent absentee, freeing employers and OPs of further responsibility. All of the above factors may contribute to lower awareness of frequent SA among the involved stakeholders. Additionally, these factors may contribute to underreporting of (short) SA spells in organizations and countries.

Frequent sickness absence, a temporary imbalance between job demands and personal resources?

However, there must be more to frequent SA than decreased motivation, considering the lower work ability scores of frequent absentees and the high risk of future long-term SA [3]. Low work

ability reflects an imbalance between job demands and personal resources, which include health, functional abilities, education, competence, values and attitudes [8]. In frequent absentees, we found the work ability score to be significantly lower than the score of a reference group of employees without frequent or long-term SA. More specifically, we found lower work ability scores in relation to the job demands and lower personal resources in frequent absentees as compared to the reference group; frequent absentees experienced more 'work impairment due to disease'. Earlier research found that poor health and chronic diseases are related to SA frequency [2,9,10] and long-term SA [11,12]. Other research showed a positive association between (physical and psychological) job demands and SA frequency [13-17].

Reduction of job demands might restore the balance between job demands and personal resources and thereby prevent or reduce SA. A systematic review reported that early part-time sick leave, together with appropriate job modification, led to a reduction in the duration and recurrence of SA [17]. Possibly, employees with frequent SA are not able or not permitted to adapt their work when temporarily not feeling well, resulting in a short-term mismatch between job demands and health. However, this does not explain why 50% of frequent absentees eventually develop long-term SA. Perhaps a longer lasting imbalance between job demands and personal resources leads to long-term SA. This may be due to e.g. increased job demands or decreased resources like health (e.g. a worsening chronic disease).

High home demands may also add to an imbalance between job demands and personal resources. In the Work-Home Resources (WH-R) model, ten Brummelhuis and Bakker state that an imbalance between job/home demands and personal resources can lead to a depletion of resources like energy, or an increase of stress when someone tries to meet (job and home) demands [18]. When chronic, such imbalance may lead to poor health and increased SA [19]. The WH-R model includes home demands, which can deplete personal resources and impede accomplishments at work, and vice versa. Home demands were not included in our prediction models, and may be one of the missing factors to predict long-term SA more accurately. Other factors from the WH-R model, such as functional ability (job skills, education, experience) and health could also be considered for inclusion in the further development of prediction models of long-term SA among frequent absentees. The WH-R model uses the more generic concept of 'health' instead of 'burnout' as used in the JD-R model. Health may in fact be a better potential predictor of future long-term SA than burnout; previous prediction studies in general working populations using health-related predictors resulted in fair discrimination between employees at risk of long-term SA and those not at risk [20-22].

Towards the prevention of future sickness absence among employees with frequent sickness absence

This thesis includes the first e-health intervention study aimed at reducing frequent SA. When comparing the intervention groups with the control group we found no effect of the e-health intervention tool for employees with frequent SA, either on SA frequency or on secondary outcome measures (total SA days, burnout, work engagement or work ability). The small sample sizes, based on the sample size calculation with a large effect size, may have been a reason for the null effect. Another reason for the null effect may be that the intervention did not include the core elements to reduce SA frequency and conducting it to protocol is challenging.

What do our findings contribute to the development of effective interventions in the future? To answer this, it is important to know why the intervention failed to reduce employees' SA frequency. Kristensen [23] proposed a theoretical model for studying the results of interventions in occupational health care. In this model the first question is: Was the intervention carried out as intended? When an intervention is not conducted as planned, this is called program failure. We have indications that program failure is an important issue in our intervention study. According to the process evaluation, only 65% of 55 process evaluation participants received an advice. Moreover, 42% of the participants in the intervention groups undertook no (new) actions after the study began, and only three participants in the blended care group actually visited the OP upon invitation. The low adherence to OP consultation was disappointing, as that was a core element in the blended care group. Recent meta-analyses showed that blended care, i.e. the combination of e-health intervention and professional guidance, is often more effective than stand-alone e-health interventions [24,25]. Another study, in the occupational health field, showed that with regard to early return to work, a blended care intervention was better than professional support only [26].

The second question addressed in Kristensen's model was effectiveness: Did the intervention lead to the intended effect? When the hypothesized working mechanism of an intervention is incorrect this is called theory failure [23]. We can neither exclude nor confirm theory failure, as we were not able to test it; SA frequency decreased considerably in all groups. We based the elements of the intervention on earlier scientific research and medical guidelines and addressed the factors relevant for frequent absentees in the intervention. However, a more explicit logical model, comparable to that of Durand et al. [27] or of Aust et al. [28], is needed to illustrate the presumed mechanisms and pathways between the elements of the intervention and the final outcomes. This may lead to improvement of the core intervention elements and the intervention effects.

Interventions on frequent SA should not only address the multiple underlying factors, but also consider the motivational phases relevant for frequent absentees to take action. Table 1 shows a chronological overview of phases requiring explicit attention to motivate employees with frequent SA to take (relevant) actions. This overview is an adapted version of the motivational phases of Prochaska and Diclemente [29]. Future intervention studies should explicitly address all these phases, using step-by-step the best available intervention elements and delivery modes. Although awareness and readiness to act are not official parts of an intervention, and therefore not included in models such as those proposed by Durand et al. [27] and Aust et al. [28], these seem very important barriers for frequent absentees to take action. Future interventions should explicitly address these phases and use better modes, consistent with ethical rules, instead of only providing information on paper, as used in the intervention study.

Table 1. Chronological motivational phases that need to be addressed to achieve change

Chronological Steps	Motivational phases leading to change
1	Awareness of frequent SA
2	Readiness to act
3	(Multifactorial) analysis + exploration of intervention possibilities
4	Prioritize intervention actions
5	Take actions
6	Evaluate, consolidate or change the intervention

Methodological considerations

Study design and statistical considerations

As this is the first comprehensive study on frequent SA, it is partly explorative in nature. This thesis included a combination of qualitative and quantitative studies to provide a better understanding of frequent SA. The focus group study provides a first insight into the ideas and beliefs of frequent absentees about frequent SA and its related factors. The cross-sectional design of the first study on the association between work ability and frequent SA does not allow for inferences about the direction of the association: does lower work ability precede frequent SA or does frequent SA precede low work ability? The systematic review points to potential predictors of long-term SA among employees with frequent SA. Although the studies in the systematic review included large populations, they were not designed to examine long-term SA among frequent absentees. Also, the number of included studies was small. Therefore, we found no clear evidence

but only indications of potential predictors of long-term SA among employees with frequent SA. The prediction model based on the risk factors emerging from these studies significantly discriminated between frequent absentees with and without long-term SA during 1-year follow-up, but was not sufficient for practice. Although theoretically the second model with burnout and work engagement should have had better discrimination, the results were comparable to the first model. Perhaps burnout is too narrowly defined; both physical and psychological job demands may result in types of disease or health complaints other than burnout. Including a more generic concept of health, such as self-rated health, may lead to better prediction of SA, as found in other studies in general working populations [20-22].

The intervention study was the first RCT to examine the effect of an e-health intervention tool on employees with frequent SA. We randomized the source population of frequent absentees to prevent systematic difference between the intervention groups and the control group. The process evaluation added important information regarding adherence to the intervention and follow-up of advice. Most participants did not use blended care, as only a few participants consulted the OP upon invitation. Possibly, the usage of blended care might have led to finding an effect from the e-health tool, as recent meta-analyses found that blended care interventions are more effective than unguided e-health interventions [24,25]. Higher adherence to blended care may be reached by offering only blended care, with the OP consultation as the main intervention and the e-health intervention in the supporting role, as preparation for the consultation.

The follow-up of advice on activities was low, indicating that readiness to act also needs to be included in an intervention model on frequent SA. This low adherence to the intervention was probably the result of the voluntary nature of our recruitment procedure, as frequent absentees may fail to see the need for action. Thus, to increase adherence to the intervention, delivery modes must be found to encourage readiness to act, while maintaining scientific and ethical standards like voluntary participation.

It could be argued that no effect was found because the intervention was restricted to the individual, i.e. the frequent absentee. A different approach has been proposed by Nielsen et al. in the IGLOO framework, that takes a broader perspective [30]. They developed an integrated framework for sustainable return to work of employees with common mental disorders with resources and support on several levels: the individual, group level (colleagues, family), leader level (manager, health care service providers), organizational level (HRM, community networks), and social context (legislation). Such a framework may help to design studies that test the effect of interventions on other levels e.g. the managerial level, or several levels. Due to legal issues

(privacy law) and ethical standards (voluntary participation of both manager and frequent absentee), such designs need careful consideration. In case of a high percentage of frequent absentees in a specific department it is likely that causes of frequent SA lie (also) at another level than the individual level. Hence, interventions at levels other than only the frequent absentee seem to be warranted.

Quality of the sample

For the studies on the association of work ability with frequent SA (chapter 3) and the prediction models of long-term SA (chapter 5) we had access to data on large Dutch working populations across different industries. These data were collected by health surveillance questionnaires in one national OHS. This may have led to a selection bias towards larger organizations, as larger organizations probably conduct more health surveillance surveys than smaller organizations. Also, participants for the focus group study and intervention study were recruited from organizations with >100 employees. Therefore, the results may not be generalizable to employees of small organizations. Healthy volunteer bias may have under-estimated associations, as participants in health surveys may be healthier than non-participants [31]. The intervention study may have suffered from a selection bias towards employees with more serious conditions. It cannot be excluded that the participants had more serious conditions than the general population of frequent absentees, as some joined the study after having started a period of long-term SA. The small sample size in combination with potential selection bias of participants may have resulted in finding no effect on the primary outcome SA frequency and the secondary outcomes SA duration, burnout, engagement and work ability.

Overall, the studies will be difficult to generalize to countries like Spain and Sweden, where SA registration takes place only after a few SA days compared to registration from the first SA day as in the Netherlands [32]. The Dutch SA registration method leads to a much higher incidence of SA spells [32] and therefore probably a much higher incidence of frequent SA than in countries where SA registration starts after a few SA days or weeks.

Quality of the data

For this thesis, cross-sectional and longitudinal data from one national OHS provider were used. The longitudinal studies used registered SA data (chapters 5 and 6). Recorded SA data are known to be more reliable than self-reported SA data [33]. Only one study on associations between work ability and types of SA (frequent short or frequent combined SA), was based on self-reported SA data; the results may therefore be recall-biased. We were able to check the validity of self-reported SA against registered SA data with a subsample of 1748 participants;

78% of the participants with recorded frequent SA reported frequent SA and 75% of those with recorded long-term SA reported long-term SA. These percentages indicate that the study has suffered to some extent from recall-bias and may have underestimated associations between work ability and different types of SA.

The use of surveillance data from one OHS provider was a strength of the studies. This provider used validated questionnaires for the surveillance questionnaires, and had a standardized method of data collection during the few years in which the studies took place. However, data on combined SA, i.e. frequent SA with at least one long-term SA spell, are not fully comparable across studies, as definitions of long-term spells differed.

Implications for practice

Frequent SA can be regarded as an early signal of future frequent SA and long-term SA. This thesis found frequent SA to be a multifactorial phenomenon. Frequent SA is related to high job demands, low job resources, poor health or chronic disease, unhealthy lifestyles and high home demands. Work ability is lower in frequent absentees than in employees without frequent or long-term SA. Considering the high risk of long-term SA among frequent absentees, the advice to employers is to target all employees with frequent SA for preventive action in order not to miss anyone facing possible SA in the future. When an employer finds it inefficient or too costly to target all frequent absentees for preventive action, (s)he can follow a high-risk group approach, targeting employees with frequent SA aged 45 years or older for preventive actions. Additionally, (s)he could consider inviting frequent absentees <45 years with low education, and all female frequent absentees <45 years for further preventive actions.

Apart from focusing on whom to target for preventive actions, an important question is: What can be done to prevent future long-term SA? Table 2 gives an overview of the chronological steps .

Table 2. Motivational actions per phase and potential actors per phase to increase actions by frequent absentees

Chronological Steps	Actions per phase	Actor
1	Increase awareness of frequent SA	Manager, supported by HRM ^a systems or OHS systems
2	Increase readiness to act	Manager Frequent absentee Possibly OP ^b
3	(Multifactorial) analysis + exploration of intervention possibilities	Frequent absentee Manager OP
4	Prioritize intervention actions	Frequent absentee + Manager or OP
5	Take appropriate actions	Frequent absentee Sometimes manager
6	Evaluate, consolidate or change the intervention	Manager + Frequent absentee Sometimes also OP

^aHRM = Human resource management, ^bOP = Occupational physician

Recognition of frequent SA is normally a management task, as managers keep a SA register and, in large organizations, are supported by human resource management systems. The OHS can support managers by informing them about an employee's third SA spell in a year. A low readiness to act prevents frequent absentees from taking (further) actions. Therefore, when an employee with frequent SA has no intrinsic motivation to undertake (further) action to reduce SA, knowledge about the high risk of future long-term SA and some form of stimulus may help. A stimulus can be a discussion between the employer and the employee, about recognizing frequent SA (step 1), and learning about the risk of future long-term SA and the importance of undertaking action to reduce SA (step 2). For further analysis (step 3), the employer and employee should together explore job demands, job resources, and home demands in an open discussion, focusing on the changes needed to reduce frequent SA and prevent long-term SA. Although it may be difficult for an employer and employee to discuss some job resources, like support by the manager or leadership style, this is very important. Good communication skills are necessary for both parties. However, as job demands, job resources and home demands are not the only factors related to frequent SA and cannot always be solved just between employer and employee, further analysis of the situation by an OP may be warranted. Frequent SA may, for example, be related to a chronic disease [10]. Furthermore, ill-health (or susceptibility to diseases) may result

from a mismatch between job demands and personal resources (health impairment process). Instead of focusing on the mild nature of the ill-health complaints in frequent SA, an OP should perform an extensive multifactorial analysis, in person or through validated questionnaires. The analysis should at least include job demands, job resources, home demands, health (physical and mental), chronic illnesses and their treatment, life style, and communication skills. Although not explicitly encountered in the studies, (early) occupational diseases should not be overlooked, especially in case of work-related complaints. The OP should help the employee to prioritize actions and, with him/her, make a joint plan of action. In many cases the employee will have to undertake further actions, such as accommodating work, improving health or learning new skills. However, sometimes the employer may also have to undertake actions concerning job demands and resources, or enabling a better work-home balance. At times other professional help may be warranted, e.g. to increase communication skills. In other cases an OP should refer to other professionals such as coaches, psychologists, or medical specialists. Moreover, to successfully prevent future long-term SA it is vital to evaluate the effect of the undertaken actions. Evaluation can be carried out by the employer and the employee, the OP and the employee or, in more complex cases, by all involved stakeholders.

Future research

This thesis is a first exploration of frequent SA. Although we gained substantial knowledge on frequent SA and predictors of long-term SA among frequent absentees, gaps remain to be addressed. More research is needed to identify predictors of future long-term SA and to identify the core elements of effective interventions. To gain more information on working mechanisms of interventions to reduce future frequent and long-term SA among frequent absentees, the advice is to build an explicit intervention logic model like those of Durand et al. [27] and Aust et al. [28]. The model can be based on steps as shown in Tables 1 and 2. To identify the most effective intervention strategies, further insight into mechanisms underlying frequent SA may be gained through quantitative and in-depth qualitative studies among frequent absentees who developed and those who did not develop long-term SA. Future intervention research should include blended care, an e-health intervention combined with personal guidance as this may lead to larger effects than from e-health-only [24,25] or professional-only [26] interventions. Higher adherence to blended care may be reached by offering only blended care, with the OP consultation as the main intervention and the e-health intervention in the supporting role, as preparation for the consultation.

Future research on interventions for employees with frequent absentees should include elements to increase awareness of the risks of frequent SA and motivation to take appropriate actions (readiness to act) by all relevant actors. An important issue is the motivation of managers and OPs; what stimulates them to act on behalf of frequent absentees and guide them to take (appropriate) actions? Which barriers keep them from playing a role to prevent future SA among frequent absentees? Answers may be found through: 1) qualitative studies among managers and OPs to explore what they need to play an effective role in guiding frequent absentees, and 2) case discussions with managers and frequent absentees.

A better prediction of long-term SA among frequent absentees may increase the motivation of managers and OPs to increase awareness of frequent SA and readiness to act in frequent absentees, as well as to provide more adequate guidance. Better discrimination between employees with and without risk of future long-term SA is also necessary to focus resources for prevention on employees at greatest risk. To better identify these employees, the prediction models need further improvement. Future studies could investigate the effect of adding work ability as a predictor variable, or of including a broader health concept (e.g. self-rated health) instead of psychological concepts like burnout. Studies including work ability [20,34-36] or health-related variables [20-22,37] in general working populations showed fair discrimination between employees with and without long-term SA during 1-year follow-up. Home demands and functional abilities (e.g. job skills, experience) may be other relevant predictors [18,19]. Based on our prediction model study and on Slany et al. [38], future prediction studies among frequent absentees should also address differences in risk profiles for men and women. Further research can also provide more clarity on the cut-off point of age in the high risk group. Frequent absentees aged 35-45 years seem at greater risk of long-term SA than their peers with low SA, but this risk is lower than in frequent absentees >45 years [39] compared to their peers. More research is also needed on the effect of prior SA: the number of SA episodes, length of prior spells, total number of days or historical SA pattern over the years.

Conclusion

This thesis is the first to focus on frequent sickness absence. Frequent SA is a multifactorial phenomenon which is often followed by future frequent and long-term SA. Frequent SA should therefore be considered a signal to take action. Factors underlying frequent SA that need to be addressed in interventions are high job demands, low job resources, home demands, unhealthy lifestyle, personal resources such as health and chronic illnesses. Important elements in the interventions to prevent future SA among frequent absentees include increasing awareness

of frequent sickness absence and readiness to act. Moreover, not only the employees with frequent SA but also their managers play an important role in prevention of future SA. Problems with high job demands, low job resources or high home demands can often be solved by joint interventions by the employer and employee. However, guidance by OPs may be necessary when managers and frequent absentees cannot find effective solutions or when chronic diseases or unhealthy lifestyles are involved. In case of communication difficulties, other occupational health professionals (e.g. occupational social workers, work & organizational experts) can support the communication between the manager and employee. Frequent SA should be regarded as a signal for both employee and manager to take action.

References

1. Schaufeli WB, Bakker AB, van Rhenen W. How changes in job demands and resources predict burnout, work engagement, and sickness absenteeism. *J Organiz Behav* 2009;30:893-917.
2. Beemsterboer WGM, Groothoff JW, Nijhuis FJN. A literature review on sick leave frequency determinants of the past decades. *Arch Public Health* 2008;66:26-34.
3. Koopmans PC, Roelen CA, Groothoff JW. Risk of future sickness absence in frequent and long-term absentees. *Occup Med* 2008;58:268-274.
4. Hörnquist JO, Hansson B, Leijon M, et al. Repeated short-term sick-leave and quality of life. An evaluation of a clinical socio-medical intervention. *Scan J Soc Med* 1990;18:91-95.
5. Philipsen H. Afwezigheid wegens ziekte en onderzoek naar oorzaken in ziekteverzuim in 83 middelgrote bedrijven (Absenteeism due to sickness, a study of causes of sickness absenteeism in 83 companies). Groningen (Netherlands): Wolters-Noordhof; 1969.
6. Hopstaken LEM. "Willens en wetens" ziekmelden als beredeneerd gedrag, Proefschrift. Groningen; 1994. <https://www.rug.nl/research/portal/files/14674175/thesis.pdf>.
7. Johansson G, Lundberg I. Adjustment latitude and attendance requirements as determinants of sickness absence or attendance. Empirical tests of the illness flexibility model. *Soc Sci Med* 2004;58:1857-1868.
8. Ilmarinen J. Work ability- a comprehensive concept for occupational health research and prevention. *Scand J Work Environ Health* 2009;35: 1-5.
9. Roelen CAM, Schreuder JAH, Koopmans PC et al. Sickness absence frequency among women working in hospital care. *Occup Med* 2009;59:502-505.
10. Roskes K, Donders NCGM, van der Gulden JWJ. Health-related and work-related aspects associated with sick leave: A comparison of chronically ill and non-chronically ill workers. *Int Arch Occup Environ Health* 2005;78:270-278.
11. Henderson M, Glozier N, Holland Elliott K. Long term sickness absence. *BMJ* 2005;330:802-803.
12. Henderson M, Stansfeld S, Hotopf M. Self-rated health and later receipt of work-related benefits: evidence from the 1970 British Cohort Study. *Psychol Med* 2013;43:1755-1762.
13. Verhaeghe R, Mak R, Maele GV, et al. Job stress among middle-aged health care workers and its relation to sickness absence. *Stress and Health* 2003;19:265-274.
14. Nielsen ML, Rugulies R, Christensen KB, et al: Psychosocial work environment predictors of short and long spells of registered sickness absence during a 2-year follow up. *J Occup Environ Med* 2006;48:591-598.

15. Vingard E, Lindberg P, Josephson M, et al: Long-term sick-listing among women in the public sector and its associations with age, social situation, lifestyle, and work factors: a three year follow-up study. *Scand J Public Health* 2005;33:370-375.
16. Von Thiele U, Lindfors P, Lundberg U: Evaluating different measures of sickness absence with respect to work characteristics. *Scand J Public Health* 2006;34:247-253.
17. Vargas-Prada S, Demou E, Laloo D, et al. Effectiveness of very early workplace interventions to reduce sickness absence: a systematic review of the literature and meta-analysis. *Scand J Work Environ Health* 2016;42:261-272.
18. Ten Brummelhuis LL, Bakker AB. A Resource Perspective on the Work–Home Interface The Work–Home Resources Model. *Amercian Psychologis*. 2012;67:545–556.
19. Ten Brummelhuis LL, Ter Hoeven CL, De Jong MDT, et al. Exploring the linkage between the home domain and absence from work: Health, motivation or both? *J Organ Behav* 2013;34:273-290.
20. Roelen C, Thorsen S, Heymans M, et al. Development and validation of a prediction model for long-term sickness absence based on occupational health survey variables. *Disabil Rehabil* 2016;40:168-175.
21. Laaksonen M, Kääriä SM, Leino-Arjas P, et al Different domains of health functioning as predictors of sickness absence -a prospective cohort study. *Scand J Work Environ Health* 2011;37:213–221.
22. Boot CRL, van Drongelen A, Wolbers I, et al. Prediction of long-term and frequent sickness absence using company data. *Occup Med* 2017;67:176–181.
23. Kristensen TS. Intervention studies in occupational epidemiology. *Occup Environ Med* 2005;62:205-210.
24. Heber E, Ebert DD, Lehr D, et al. The benefit of web- and computer-based interventions for stress: A systematic review and meta-analysis. *J Med Internet Res* 2017;19:e32.
25. Hutchesson MJ, Rollo ME, Krukowski R, et al. eHealth interventions for the prevention and treatment of overweight and obesity in adults: a systematic review with meta-analysis. *Obes Rev* 2015;16:376–92.
26. Volkert D, Zijlstra-Vlasveld MC, Anema JR, et al. Effectiveness of a blended e-health intervention on return to work for sick-listed employees with common mental disorders: results of a cluster randomized controlled trial. *J Med Internet Res* 2015;17:e116.
27. Durand MJ, Vachon B, Loisel P, et al. Constructing the program impact theory for an evidence-based work rehabilitation program for workers with low back pain. *Work* 2003;21:233-242.
28. Aust B, Helverskov T, Nielsen MBD, et al. The Danish national return-to-work program – aims, content, and design of the process and effect evaluation, *Scan J Work Environ Health* 2012;38:120-133.
29. Prochaska, JO, DiClemente, CC. Stages and processes of self-change in smoking: toward an integrative model of change. *Journal of Consulting and Clinical Psychology* 1983;5:390-395.
30. Nielsen K, Yarker J, Munir F, et al. IGLOO: An integrated framework for sustainable return to work in workers with common mental disorders. *Work & Stress* 2018;32:400-417.

31. Froom P, Melamed S, Kristal-Boneh E, et al. Healthy volunteer effect in industrial workers. *J Clin Epidemiol* 1999;52:731-735.
32. Gimeno D, Bültmann U, Alexanderson K, et al. Cross-national comparisons of sickness absence systems and statistics: towards common indicators. *Eur J Public Health* 2014;24:663-666.
33. Hoogduin CA, van Leusden R. Management of sickness absence: successes. Amsterdam: Boom; 2006.
34. Reeuwijk KG, Robroek SJ, Niessen MA, et al. The prognostic value of the work ability index for sickness absence among office workers. *PLoS One*. 2015;10:e0126969.
35. Schouten LS, Joling C, van der Gulden JWJ, et al. Screening manual and office workers for risk of long-term sickness absence: cut-off points for the Work Ability Index. *Scand J Work Environ Health*. 2015;41:36-42.
36. Schouten LS, Bültmann U, Heymans MW, et al. Shortened version of the work ability index to identify workers at risk of long-term sickness absence. *Eur J Public Health* 2016;26:301-305.
37. Airaksinen J, Jokela M, Virtanen M et al. Prediction of long-term absence due to sickness in employees: development and validation of a multifactorial risk score in two cohort studies. *Scand J Work Environ Health* 2018;44:274-282.
38. Slany C, Schütte S, Chastang JF, et al. Psychosocial work factors and long sickness absence in Europe. *Int J Occup Environ Health*;2014;20:16-25.
39. Koopmans PC, Roelen CAM, Groothoff JW. Frequent and long-term absence as a risk factor for work disability and job termination among employees in the private sector. *Occup Environ Med* 2008;65:494-499.

