



UvA-DARE (Digital Academic Repository)

Cognitions and perceptions of workers with a chronic disease

Development and evaluation of a training program for occupational health professionals

de Wit, M.E.C.

Publication date

2021

[Link to publication](#)

Citation for published version (APA):

de Wit, M. E. C. (2021). *Cognitions and perceptions of workers with a chronic disease: Development and evaluation of a training program for occupational health professionals*. [Thesis, fully internal, Universiteit van Amsterdam].

General rights

It is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), other than for strictly personal, individual use, unless the work is under an open content license (like Creative Commons).

Disclaimer/Complaints regulations

If you believe that digital publication of certain material infringes any of your rights or (privacy) interests, please let the Library know, stating your reasons. In case of a legitimate complaint, the Library will make the material inaccessible and/or remove it from the website. Please Ask the Library: <https://uba.uva.nl/en/contact>, or a letter to: Library of the University of Amsterdam, Secretariat, Singel 425, 1012 WP Amsterdam, The Netherlands. You will be contacted as soon as possible.



CHAPTER 8

General discussion

General discussion

The main objective of this thesis was to gain more knowledge on how occupational health professionals (OHPs) can involve cognitions and perceptions in the occupational health management and work disability assessment of workers with a chronic disease. Part I of this thesis focused on acquiring knowledge from the literature, from OHPs and from workers with a chronic disease regarding cognitions and perceptions associated with work participation. Part II of this thesis described the development and evaluation of a training program for OHPs to involve cognitions and perceptions in daily practice.

Main findings

Part I: Acquiring knowledge about cognitions and perceptions

1. Which cognitions and perceptions of workers are associated with work participation?

In the systematic review described in **Chapter 2**, evidence was found for an association between work participation and ten different cognitions and perceptions: expectations regarding recovery or return to work (RTW), optimism/pessimism, self-efficacy, motivation, feelings of control, perceived health, coping strategies, fear-avoidance beliefs, perceived work-relatedness and catastrophizing.

2. How can information about cognitions and perceptions best be obtained from workers?

According to OHPs who participated in a survey study (**Chapter 3**) and workers with a chronic disease who participated in a focus group study (**Chapter 4**), there are different methods to obtain information concerning cognitions and perceptions. Examples include the following: discussing the factors during consultations; using questionnaires to obtain information; or asking significant others, employers, or treating physicians for information about the factors. According to OHPs and workers, the best method is to obtain information by discussing cognitions and perceptions during consultations.

3. Which existing interventions are focused on cognitions and perceptions and aimed at increasing work participation?

In a scoping review, 29 published studies were identified in which interventions were studied, focusing on changing at least one of ten cognitions and perceptions and aimed at increasing work participation. Four interventions were judged as effective in changing coping, self-efficacy, fear-avoidance

beliefs, or perceived work-relatedness and work participation, according to the results of randomized controlled trials (**Chapter 5**).

Part II: Development and evaluation of a training program on cognitions and perceptions

4. Is a training program on involving cognitions and perceptions in the occupational health management and work disability assessment feasible from the perspective of OHPs?

Participants in the training program agreed that the training program was useful and expressed the intention to use the learned skills in their practice. Although the training program was perceived as being feasible, not all participants used all learned skills and the corresponding tool during consultations three to six months after the training (**Chapter 6**).

5. What is the effect of a training program for OHPs on the ability to involve cognitions and perceptions in the occupational health management and work disability assessment of workers with a chronic disease?

A randomized controlled trial using video vignettes showed that training participation increased the ability of OHPs to identify cognitions and perceptions of workers and to recommend evidence-based interventions aimed at these cognitions and perceptions (**Chapter 7**).

Interpretation of the findings

Part I: Acquiring knowledge about cognitions and perceptions

In the conducted systematic review, evidence was found for the association between ten cognitions and perceptions and work participation.¹ Although the quality of evidence for the association between some cognitions and perceptions and work participation was rather low, both occupational physicians (OPs) and insurance physicians (IPs) confirmed that cognitions and perceptions are important for work participation.² This underscores the need for OHPs to take these factors into account during their practices.

Many studies included in the review consider the ten cognitions and perceptions as clearly distinct factors and use different questionnaires to measure them.¹ During the training program, OHPs furthermore learn to distinguish the different cognitions and perceptions, which helped them to recognize and name them better during their practices.³ However, some of the factors are interrelated to each other. For instance, if a worker perceives the health problem as work-related, he or she is more likely to have fear-avoidance beliefs for work. If the worker has

catastrophizing thoughts, he or she is also likely to have negative expectations regarding RTW. Indeed, in a study of Carriere et al.⁴, expectations regarding RTW partially mediated the relation between catastrophizing and RTW and fully mediated the relationship between fear-avoidance and RTW. It is therefore not surprising that in our scoping review interventions were identified which were effective in changing more than one cognition or perception.⁵ It might therefore not be necessary for OHPs to recommend separate interventions for every limiting cognitions or perception they identify, if some of the cognitions and perceptions are interrelated to each other. Therefore, OHPs should consider whether the limiting cognitions and perceptions they have identified are interrelated to each other when recommending interventions.

Some workers are more likely to have limiting cognitions and perceptions than others, dependent on for example their health complaints, their occupation or other personal characteristics. For example, workers with a chronic disease and who experience pain might be more likely to have fear-avoidance beliefs for physical work than workers with a chronic disease who do not experience pain. In addition, some cognitions and perceptions seem to be associated with specific personality traits. People who score high on neuroticism are more likely to have fear-avoidance beliefs and catastrophizing thoughts, while people who score high on extraversion are less likely to have fear-avoidance beliefs.^{6,7} Although some workers are more likely to have limiting cognitions and perceptions than others, OHPs should be aware that every worker they see during consultations can have cognitions and perceptions that may limit work participation.

In the survey study among OHPs and the focus group study among workers with a chronic disease, different methods were identified to obtain information concerning cognitions and perceptions.^{2,8} When looking into the literature, self-report questionnaires are mostly used to obtain information regarding cognitions and perceptions, e.g., the Fear-Avoidance Beliefs Questionnaire and the Pain Catastrophizing Scale.^{9,10} OHPs who participated in our survey study reported using the Dutch Four-Dimensional Symptom Questionnaire to assess fear-avoidance beliefs and optimism/pessimism.^{2,11} Using questionnaires for obtaining information regarding cognitions and perceptions has advantages as it is a more objective, standardized, and inexpensive method to obtain information concerning cognitions and perceptions.¹² Moreover, it may also save time for OHPs during consultations, when the questionnaires on cognitions and perceptions are already completed by the worker before the consultations. However, using questionnaires also has disadvantages. Workers in the focus group study voiced

concern that using a questionnaire may limit the comprehensiveness of the answers that a worker would provide concerning cognitions and perceptions, which is a common reported disadvantage of questionnaires.^{8, 13} Workers also believed that using questionnaires may elicit dishonest responses because of the fear that other people than the OHP may read their answers. Another disadvantage of using self-report questionnaires is that some people tend to respond in a way on questionnaires that negatively influences the validity of the results.^{12, 13} For example, they tend to agree with statements ('acquiescent responding') or have a tendency to use extreme scores on rating scales ('extreme responding'). In addition, questions might be not clear enough which can lead to different interpretations of questions.¹³ So, using questionnaires might not be the best way to obtain information about cognitions and perceptions.

It is therefore not surprising that OHPs in our survey study and workers in our focus group study did not prefer the use of questionnaires, but preferred to obtain information about cognitions and perceptions by discussing these factors during consultations.^{2, 8} However, this method comes with challenges for OHPs. First, the possibility for the OHP to identify cognitions and perceptions is highly dependent on which questions the OHP asks and how much information the worker discloses. The Disclosure Decision-Making Model states that the consideration of the risks and benefits of disclosure is an important step for deciding to disclose information or not.¹⁴ If the risk of disclosing information outweighs the benefits, one will decide to not disclose or to wait with disclosing the information. Disclosing information regarding cognitions and perceptions to OHPs can be perceived as beneficial for workers because disclosure may help OHPs to provide emotional support and to provide tailored care for the worker, and it can give the worker a comfortable feeling that one does not conceal information. However, risks that workers might perceive are the risk of judgment, receiving negative news, being embarrassed, or being prescribed difficult lifestyle changes or other interventions.^{15, 16} Workers might therefore hesitate to disclose information, especially toward OHPs, because they are afraid that information may be shared with the employer, or because disclosure may have a negative influence on receiving disability benefits. For instance, based on what the worker says the OHP could decide that the worker is able to (partially) RTW or that the worker did not do enough to promote his or her recovery, which can influence whether the workers receives disability benefits.

A second barrier for OHPs for obtaining information during consultations is that, simply put, disclosure requires a trustful relationship.¹⁷⁻¹⁹ The importance of trust for discussing cognitions and perceptions was also emphasized by the workers

in our focus group study.⁸ A recent study of Steel et al.¹⁹ showed that lower trust in the physician in turn lowers the intention of workers to disclose problems or concerns during consultations with OPs. A trustful relationship is relatively hard to establish between OHPs and patients. A patient's trust in a physician is influenced by the amount of contact between patient and physician and the extent to which a patient can choose the physician.^{20, 21} Workers do not have the possibility to choose their own OP or IP which in turn can increase the feelings of distrust of the employee. This was also emphasized by the workers in our focus group study who mentioned that they had the feeling that OHPs did not have an independent position, but were merely there to limit the costs of the employer instead of help the worker.⁸ In addition, workers from the focus group study mentioned that the frequency of contact between the workers and OHPs is low and that they often do not see the same OP more than once. The contact moment between IPs and workers is often only once. In comparison with general practitioners, this is an extra barrier for OPs and IPs in building a trustful relationship with their client. So, although information about cognitions and perceptions can best be obtained during consultations, doing so requires extra effort from OHPs. Therefore, education and support in which questions to ask, but also about the importance of trust and other factors that can influence disclosure, is crucial for OHPs to be able to obtain information during consultations. In the developed training program, this topic is therefore given extra attention.

When OHPs succeed in obtaining information concerning cognitions and perceptions of workers, it is important that they know which interventions they can recommend that are aimed at limiting cognitions and perceptions. In a scoping review different interventions were identified that may change limiting cognitions and perceptions and increase work participation.⁵ However, only four interventions were judged as effective in changing cognitions and perceptions and increasing work participation in randomized controlled trials. This might question the changeability of cognitions and perceptions by interventions. However, in the scoping review, multiple promising interventions were identified which seem to change cognitions and perceptions over time, according to different cohort studies. Besides, there are activities OPs and IPs may do themselves during consultations to change cognitions and perceptions of workers, as also mentioned by the OPs and IPs who were consulted to give feedback on the findings of the scoping review. For example, guidelines for OPs and IPs state that providing clear and unambiguous information about the disability and possibilities for work during consultations can help workers establish realistic expectations for RTW.²² More randomized controlled trials should be conducted to test the effectiveness

of efforts of OHPs to change cognitions and perceptions during consultations and to test the effectiveness of other promising interventions.

Part II: Development and evaluation of a training program on cognitions and perceptions

Previously conducted studies have made clear that physicians struggle to translate evidence-based knowledge into practice and behavior change of physicians is often necessary.^{23, 24} Therefore, we used the Behavior Change Wheel framework in the development of our intervention.²⁴ Following this framework, a training program would be a suitable intervention to increase the capability of OHPs to involve cognitions and perceptions into the occupational health management and work disability assessment, which could facilitate OHPs to involve these factors in daily practice. The training program contained various exercises because previous studies showed that activating physicians and practicing with knowledge and skills is more effective in changing physician behavior than passive education methods.²⁵⁻²⁹ It is important to link education to clinical cases of physicians.²⁷ Therefore, during the training, the participants discussed their own cases and how they have been dealing with limiting cognitions and perceptions in these cases. In order to help OHPs apply learned skills in daily practice, a conversation tool was also developed.

The training program seemed to be effective in supporting OHP behavior change.³ Out of 53 participants, 52 expressed the intention to use their obtained skills in practice. Most participants who were interviewed three to six months after participating in the training mentioned they were more aware of cognitions and perceptions during consultations, were better in recognizing them, and that the identification of these factors helped them to predict the future ability of the client. However, some participants did not use the tool or all learned skills, did not recommend other, more effective interventions, or did not change anything in their reports. This raises the question of whether participating in the training program is enough for OHPs to change their behavior and what can be done to increase the use of the skills into practice.

The question can be posed as to whether participation in one training session of 4.5 hours is enough to change the behavior of OHPs. In a meta-analysis about effective continuing medical education, the duration and frequency of sessions were positively associated with the effectiveness of continuing medical education.²⁹ However, a lack of time is often perceived as a barrier to continuing medical education.³⁰⁻³² Also, the participants in our study mentioned that a lack of time would be a barrier

for participation in the training. So, while increasing the duration of the training or increasing the number of training sessions could help to change physician behavior, doing so could also be a barrier for OHPs to participate in the first place. Thus, extending the duration and number of sessions of the training may not be the best way to increase the impact of the training on the behavior of OHPs.

In the training program, we focus especially on increasing the capability of OHPs to involve cognitions and perceptions during their practices. The Behavior Change Wheel identifies capability as one important target for intervention to change behavior.²⁴ However, other essential conditions for changing behavior described in this model are motivation and opportunity. Opportunity is defined as the factors outside the individual that make the behavior change possible. Although the current training program was effective in increasing the capability of OHPs,³³ a barrier for implementing the learned skills was related to opportunity, namely time. Participants experienced a lack of time to acquaint themselves with the tool and a lack of time during consultations to discuss cognitions and perceptions which limited their behavior change. In the Netherlands, consultations with OPs are often of a shorter duration than the consultations with IPs. Although the duration of consultations with IPs is longer, IPs often only see workers once, while OPs often have more than one consultation with a worker. Extending the duration or frequency of consultations might give OHPs more opportunity in order to change their behavior. The extensions increase the time to obtain information, which can help in identifying limiting cognitions and perceptions and also gives more opportunity to build a trustful relationship with the client.

Besides increasing the opportunity for OHPs to change behavior, there are different actions that can be conducted by responsible authorities to support the behavior change.²⁴ Examples of these actions or policies as described in the Behavior Change Wheel are the creation of guidelines or establishing principles of behavior or practice. Making the involvement of cognitions and perceptions more standard in practice, for example by including more information about these factors in guidelines for OHPs, might be an extra stimulation for OHPs to focus on cognitions and perceptions during consultations. The OPs and IPs who were interviewed about their experiences with implementing the knowledge and skills into practice, had an average of more than 15 years of work experience. Therefore, implementing the skills would for the majority of them require changing long-established practices, which is difficult.³⁴ This means that it might be helpful to embed the training program into the education of OHPs in training, in addition to offering the training program as continuing medical education. Embedding the training program into the education

of OHPs in training could help to make involving cognitions and perceptions a standard of practice, which will support OHPs to do so.

Methodological considerations

Several research methods and sources were used to acquire knowledge about cognitions and perceptions needed for the development of the training program.³ We combined evidence derived from the literature, with information from OHPs and workers with chronic diseases, because previous studies have emphasized the importance of personal experiences from physicians and patients for translating scientific evidence into practice.^{35, 36} Two reviews were conducted to obtain information about 1) the association between cognitions and perceptions and work participation and 2) interventions aimed at these cognitions and perceptions.^{1, 5} Systematic reviews and scoping reviews can provide a structured overview of evidence from the latest published studies from all over the world regarding these topics.^{37, 38} However, in these reviews only studies were included which were published in scientific journals, and no grey literature was included. Especially for the review with recent published studies about existing interventions focused on cognitions and perceptions, relevant information might have been missed. OHPs who were consulted to provide feedback on the findings of the review mentioned that they sometimes try to change cognitions and perceptions during consultations. Efforts of the OHP to mitigate limiting cognitions and perceptions during consultations likely are effective for changing cognitions and perceptions, although no studies were found on this in the scoping review. Besides, some of the interventions from studies included in the scoping review were not yet available to recommend toward workers in the Netherlands. Therefore, the information regarding changing cognitions and perceptions provided in the last part of the training was completed with information from developed guidelines for OPs and IPs in the Netherlands. These guidelines for physicians consist of recommendations and instructions for practice to support decision-making and are developed by experts with the use of scientific evidence.³⁹ In the guidelines, some recommendations are stated for OHPs to intervene on different limiting cognitions and perceptions, although the evidence was limited.

To study the effects of the training on the ability to identify cognitions and perceptions and to recommend evidence-based interventions, we used a randomized controlled trial design which can provide the best evidence when measuring the effect of an intervention.^{33, 40} Many studies use knowledge tests in comparable trials to study the effect of training programs. However, the problem with knowledge tests is that they only require participants to memorize knowledge

that they have heard. Instead of using a knowledge test, we used video vignettes to study the effect of the training program. OHPs were asked to identify cognitions and perceptions in video vignettes of consultations between a physician and a client and to recommend interventions aimed at these cognitions and perceptions. Using video vignettes gave the opportunity to test the ability to use skills in new situations that simulated a real-life situation, instead of just memorizing knowledge. Video vignettes of consultations with clients are commonly used for assessing or training the skills of physicians.^{41, 42} Using video vignettes gives the opportunity to present exactly the same clients who say the same things and show the same nonverbal behavior toward participants in the control and intervention group. Therefore, changes in which cognitions and perceptions were identified can be assigned to differences in knowledge concerning cognitions and perceptions and skills to identify them.

However, the use of video vignettes instead of real-life consultations has also disadvantages. First of all, the question remains whether video vignettes are realistic enough to reflect consultations in daily practice. Therefore, the effect which is measured using video vignettes is questionable as to whether it is generalizable to real-life situations. Different researchers suggest testing the ecological validity of video vignettes, for example by assessing the engagement of the viewer of the vignettes,⁴³ by asking the viewer questions regarding the realism or believability of the video vignettes,⁴⁴ or by asking the viewer to compare the patient in the video vignette to patients the viewer encounters in daily practice.⁴⁵ We did not extensively study the realism of the video vignettes afterwards. However, results of a review of literature by Hillen et al.⁴⁴ indicate that video vignettes of communication between patients and providers are often perceived as realistic. We followed different suggestions by Hillen et al.⁴⁴ to establish realism in the video vignettes. We based the scripts of the video vignettes on audio records of real consultations between an OP and clients and used professional actors for playing the roles of clients, which was also proven to be successful for developing realistic video vignettes in similar studies.^{45, 46} Besides, different OHPs with experience in consultations were involved in the development of the scripts and video vignettes to ensure that the vignettes reflect real cases, as recommended in previous studies.^{44, 47} Therefore, we believe that we put enough effort to succeed in making realistic video vignettes.

Another disadvantage of using video vignettes in this study was that, while we were able to test the ability to identify cognitions and perceptions with these vignettes, we were not able to test the skills of the OHPs to elicit information

from workers in order to identify these cognitions and perceptions. During the training, OHPs learned for example about factors that can influence the course of the conversation and about which questions to ask to elicit information. Previous studies show that it is possible to test some communication strategies, such as asking questions, with video vignettes. Physicians watched video vignettes of patients who ask a question or make a statement and were subsequently asked to speak into a microphone, as if they were talking back to the patient.^{41, 48} However, also in this study, the interaction between the simulated patient and physician is limited to one exchange.

It is possible that we have underestimated the effect of the training on the ability to identify cognitions and perceptions, because we did not consider the increase in ability to elicit information needed to identify cognitions and perceptions. The difference in ability to identify cognitions and perceptions between OHPs who participate in the training and who do not participate in the training might be bigger in daily practice. However, it is also possible that we have overestimated the ability of OHPs to identify cognitions and perceptions, because in consultations in daily practice, the ability to identify cognitions and perceptions is dependent on how much information the OHP can elicit. Besides, there were OHPs who participated in the training and mentioned that it was sometimes still hard to identify cognitions and perceptions during consultations in daily practice. This could be caused by a lack of ability to elicit enough information from workers during the consultation. It is therefore recommended to test the effect of the training on the ability to elicit information on cognitions and perceptions and on the ability to identify cognitions and perceptions in consultations in daily practice.

Another consideration with regard to studying the effect of the training program is that we did not study the effect of the training on the actual work participation of workers with a chronic disease. Therefore, we do not know whether the benefits of increased work participation as a result of OHPs participation in the training outweigh the costs of training the physicians. We know that participation in the training increased the ability of OHPs to recommend evidence-based interventions toward limiting cognitions and perceptions of workers and that are aimed at increasing work participation. Therefore, we think that participation in the training program can help OHPs to increase work participation of workers with a chronic disease. However, we did not study this direct effect in the current project. An important reason for not directly studying this effect is that we did not know whether the training program changed the ability of OHPs to involve cognitions and perception during their practice. Therefore, we decided to test whether the

intervention really has an effect on the skills of OHPs first. Now we know that training can increase the ability of OHPs to identify cognitions and perceptions and to recommend interventions aimed at these cognitions and perceptions, the next step would be to study the effect on work participation.

Recommendations for practice

The following is recommended for OHPs:

- *Participate in the training program on cognitions and perceptions.*
Participation in the training program can help OHPs to identify cognitions and perceptions and to recommend evidence-based interventions to change limiting cognitions and perceptions. We believe that participation in the training can help OHPs to involve cognitions and perceptions during their practices and can help to encourage work participation of workers with a chronic disease.
- *Invest in building a trustful relationship with the worker.*
Trust is a prerequisite for workers to disclose information about their cognitions and perceptions toward OHPs. Disclosure is needed for OHPs to be able to identify limiting cognitions and perceptions and to be able to mitigate these cognitions and perceptions in order to support work participation. Investing in a trustful relationship and creating an atmosphere in which workers feel comfortable to disclose information is essential for OHPs to be able to help workers with limiting cognitions and perceptions.

The following is recommended for workers with a chronic disease:

- *Prepare consultations with OHPs.*
It is important for workers to prepare the consultation with OHPs by considering their answers to questions such as: What are my expectations regarding RTW? Why do I want to RTW? How do I cope with my health problems? The information about these cognitions and perceptions can help OHPs in their efforts to help workers.

The following is recommended for employers:

- *Assure that workers can go to the same OP, instead of different OPs for every consultation.*
A trustful relationship between workers and OPs is important for workers to disclose information. Seeing different OPs instead of the same OP during different consultations can limit the possibility for workers to build a trustful relationship.

The following is recommended for the patient federation:

- *Help workers to prepare the consultations with OHPs.*

Workers need to be aware of the tasks of OHPs and what to expect from consultations with them. Besides, workers need to be aware of the importance of disclosing information during consultations. The patient federation can help workers with providing information about consultations and preparing consultations.

The following is recommended for policymakers and professional associations of OHPs:

- *Offer the training program in continuing medical education and the education of OHPs in training.*

Because the training program can help OHPs to identify limiting cognitions and perceptions and recommend evidence-based interventions, the training should be offered to OHPs. Offering the training in the education of OHPs in training can help to make involving cognitions and perceptions in the occupational health management and disability assessment a standard of practice.

- *Provide information about cognitions and perceptions and involving them in the occupational health management and work disability assessment in guidelines for OHPs.*

Offering information regarding cognitions and perceptions in guidelines can be an extra stimulation for OHPs to focus on these factors during consultations. It can help to make involving cognitions and perceptions a standard of practice.

- *Assure that OHPs have enough time with workers to discuss cognitions and perceptions.*

OHPs need to be able to discuss cognitions and perceptions during consultations, and therefore they need sufficient time with the worker. Besides, time between the OHP and the worker can help to establish a trustful relationship which can have a positive effect on disclosing information. Extending the duration of consultations or the number of consultations can therefore facilitate OHPs to involve cognitions and perceptions during their practices.

Recommendations for research

The following is recommended for future research:

- *Study how a patient's trust in the OHPs can be increased in order for patients to disclose information concerning cognitions and perceptions.*

Trust was identified as a prerequisite for workers to disclose information regarding cognitions and perceptions. Although we know that trust is for example influenced by the amount of contact between patient and physician and the possibility to choose the physician, more information about how to establish a trustful relationship between OHPs and workers is needed.

- *Conduct more randomized controlled trials to test the effect of interventions focused on cognitions and perceptions and aimed at increasing work participation.*

In our scoping review we found multiple promising interventions focused on cognitions and perceptions and aimed at increasing work participation in longitudinal studies. Randomized controlled trials are needed to test whether these interventions and other efforts by OHPs are really effective in changing cognitions and perceptions and increasing work participation.

- *Study how to increase the feasibility of the learned knowledge and skills into practice.*

Although the training was overall perceived as feasible, not every participant used all learned knowledge and skills in practice. Therefore, studies are needed to test whether for example extending the duration of the training program or number of sessions, or offering the training in the education OHPs in training can support behavior change.

- *Study the effect of the training on identifying cognitions and perceptions and recommending interventions toward cognitions and perceptions in consultations in daily practice.*

The training program increased the ability to identify cognitions and perceptions and to recommend evidence-based interventions in a video vignette study. However, for identifying cognitions and perceptions of workers in consultations in daily practice OHPs need to be able to elicit information regarding cognitions and perceptions, which is not examined in this study. Therefore, additional studies are needed to test the effect of the training in consultations in daily practice.

- *Study the effect of the training on the work participation of workers with a chronic disease and conduct an additional cost-effectiveness analysis.*

Although we know that participation in the training increases the ability of OHPs to recommend evidence-based interventions toward limiting cognitions and perceptions of workers and that are aimed at increasing work participation, we did not directly study the effect of the training on the work participation of workers with a chronic disease. Additional studies are needed to test whether the benefits of increased work participation as a result of OHPs participation in the training outweigh the costs of training physicians.

Conclusion

Cognitions and perceptions are important factors that can influence the work participation of workers with a chronic disease. In this thesis, knowledge was acquired from the literature, from OHPs, and from workers with a chronic disease regarding cognitions and perceptions associated with work participation. With this information, a training program was developed for OHPs to involve cognitions and perceptions in the occupational health management and work disability assessment of workers with a chronic disease. Participation in the training program resulted in an increased ability of OHPs to identify cognitions and perceptions and to recommend evidence-based interventions aimed at these cognitions and perceptions. The training was perceived as feasible, but not all participants used all the learned skills and the corresponding tool during practice. The knowledge acquired in this thesis and the developed training program can help OHPs in their efforts to increase work participation of workers with a chronic disease.

References

1. de Wit M, Wind H, Hulshof CTJ, Frings-Dresen MHW. Person-related factors associated with work participation in employees with health problems: a systematic review. *Int Arch Occup Environ Health*. 2018;91(5):497-512.
2. de Wit M, Wind H, Snippen NC, Sluiter JK, Hulshof CTJ, Frings-Dresen MHW. Physicians' perspectives on person-related factors associated with work participation and methods used to obtain information about these factors. *J Occup Environ Med*. 2019;61(6):499-504.
3. de Wit M, Zipfel N, Horreh B, Hulshof CTJ, Wind H, de Boer AGEM. Training on involving cognitions and perceptions in the occupational health management and work disability assessment of workers: development and evaluation. Submitted.
4. Carriere JS, Thibault P, Milioto M, Sullivan MJL. Expectancies mediate the relations among pain catastrophizing, fear of movement, and return to work outcomes after whiplash injury. *J Pain*. 2015;16(12):1280-1287.
5. de Wit M, Horreh B, Daams JG, Hulshof CTJ, Wind H, de Boer AGEM. Interventions on cognitions and perceptions that influence work participation of employees with chronic health problems: a scoping review. *BMC Public Health*. 2020;20(1):1610.
6. Ibrahim ME, Weber K, Courvoisier DS, Genevay S. Big five personality traits and disabling chronic low back pain: association with fear-avoidance, anxious and depressive moods. *J Pain Res*. 2020;13:745-754.
7. Kadimpati S, Zale EL, Hooten WM, Ditre JW, Warner DO. Associations between neuroticism and depression in relation to catastrophizing and pain-related anxiety in chronic pain patients. *PLoS One*. 2015;10(4):e0126351.
8. de Wit M, Wind H, Hulshof CTJ, de Boer AGEM. Obtaining person-related information from employees with chronic health problems: a focus group study. *Int Arch Occup Environ Health*. 2019;92(7):1003-1012.
9. Waddell G, Newton M, Henderson I, Somerville D, Main CJ. A fear-avoidance beliefs questionnaire (FABQ) and the role of fear-avoidance beliefs in chronic low back pain and disability. *Pain*. 1993;52(2):157-168.
10. Sullivan MJL, Bishop SR, Pivik J. The pain catastrophizing scale: development and validation. *Psychol assess*. 1995;7(4):524-532.
11. Terluin B, van Marwijk HWJ, Adèr HJ, de Vet HCW, Penninx BWJH, Hermens MLM, et al. The Four-Dimensional Symptom Questionnaire (4DSQ): a validation study of a multidimensional self-report questionnaire to assess distress, depression, anxiety and somatization. *BMC Psychiatry*. 2006;6(1):34.
12. Paulhus DL, Vazire S. The self-report method. *Handbook of research methods in personality psychology*. New York, New York: Guilford Press; 2007.
13. Demetriou C, Ozer BU, Essau CA. Self-report questionnaires. *The encyclopedia of clinical psychology*. New York, New York: John Wiley & Sons Inc; 2015.

14. Greene K. An integrated model of health disclosure decision-making. Uncertainty, information management, and disclosure decisions: theories and applications. New York, New York: Routledge; 2009.
15. Saiki LS, Lobo ML. Disclosure: a concept analysis. *J Adv Nurs*. 2011;67(12):2713-2722.
16. Burgoon M, Callister M, Hunsaker FG. Patients who deceive: an empirical investigation of patient-physician communication. *J Lang Soc Psychol*. 1994;3(4):443-468.
17. Davies HT, Rundall TG. Managing patient trust in managed care. *Milbank Q*. 2000;78(4):609-624.
18. Rowe R, Calnan M. Trust relations in health care—the new agenda. *Eur J Public Health*. 2006;16(1):4–6.
19. Steel JS, Godderis L, Luyten J. Disclosure in online vs. face-to-face occupational health screenings: a cross-sectional study in Belgian hospital employees. *Int J Environ Res Public Health*. 2021;18(4):1460.
20. Thom DH, Ribisl KM, Stewart AL, Luke DA, The Stanford Trust Study Physicians. Further validation and reliability testing of the Trust in Physician Scale. *Med Care*. 1999;37(5):510-517.
21. Balkrishnan R, Dugan E, Camacho FT, Hall MA. Trust and satisfaction with physicians, insurers, and the medical profession. *Med Care*. 2003;41(9):1058-1064.
22. Vooijs M, Van der Heide I, Leensen M, Hoving J, Wind H, Frings-Dresen MHW. Richtlijn chronisch zieken en werk, Coronel Instituut voor Arbeid en Gezondheid. 2016. Available from: <https://www.nvvg.nl/richtlijnen/>. Accessed: Jan 2021.
23. Berenholtz S, Pronovost PJ. Barriers to translating evidence into practice. *Curr Opin Crit Care*. 2003;9(4):321-325.
24. Michie S, van Stralen MM, West R. The behaviour change wheel: a new method for characterising and designing behaviour change interventions. *Implement Sci*. 2011;6:42.
25. Davis D, O'Brien MAT, Freemantle N, Wolf FM, Mazmanian P, Taylor-Vaisey A. Impact of formal continuing medical education: do conferences, workshops, rounds, and other traditional continuing education activities change physician behavior or health care outcomes? *JAMA*. 1999;282(9):867-874.
26. Mazmanian PE, Davis DA. Continuing medical education and the physician as a learner: guide to the evidence. *JAMA*. 2002;288(9):1057-1060.
27. Mostofian F, Ruban C, Simunovic N, Bhandari M. Changing physician behavior: what works. *Am J Manag Care*. 2015;21(1):75-84.
28. Berkhof M, van Rijssen HJ, Schellart AJ, Anema JR, van der Beek AJ. Effective training strategies for teaching communication skills to physicians: an overview of systematic reviews. *Patient Educ Couns*. 2011;84(2):152-162.
29. Mansouri M, Lockyer J. A meta-analysis of continuing medical education effectiveness. *J Contin Educ Health Prof*. 2007;27(1):6-15.
30. Neate SL, Dent AW, Weiland TJ, Farish S, Jolly B, Crotty BC. Barriers to continuing medical education in Australian prevocational doctors. *Aust Health Rev*. 2008;32(2):292-300.

31. Goodyear-Smith F, Whitehorn M, McCormick R. Experiences and preferences of general practitioners regarding continuing medical education: a qualitative study. *N Z Med J.* 2003;116(1172):1-10.
32. Walton HJ. Continuing medical education in Europe: a survey. *Med Educ.* 1994;28(5):333-342.
33. de Wit M, Horreh B, Hulshof CTJ, Wind H, de Boer AGEM. Effects of a training program for occupational health professionals on the cognitions and perceptions of workers: a randomized controlled trial. Submitted.
34. Hardie Alvanzo A, Cohen GM, Nettleman M. Changing physician behavior: half-empty or half-full? *Clin Govern Int J.* 2003;8(1):69-78.
35. Green J, Britten N. Qualitative research and evidence based medicine. *BMJ.* 1998;316:1230-1232.
36. Malterud K. The art and science of clinical knowledge: evidence beyond measures and numbers. *Lancet.* 2001;358(9279):397-400.
37. Mulrow CD. Systematic reviews: rationale for systematic reviews. *BMJ.* 1994;309:597-599.
38. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol.* 2005;8(1):19-32.
39. Nauta AP, Manders JHM, Hulshof CTJ, Duijn JCM, van Vliet C. Implementatie van NVAB-richtlijnen. *TBV.* 2006;14(6):317-318.
40. Akobeng AK. Understanding randomised controlled trials. *Arch Dis Child.* 2005;90(8):840-844.
41. Mazor KM, Haley HL, Sullivan K, Quirk ME. The video-based test of communication skills: description, development, and preliminary findings. *Teach Learn Med.* 2007;19(2):162-167.
42. Baribeau DA, Mukovozov I, Sabljic T, Eva KW, Delottinville CB. Using an objective structured video exam to identify differential understanding of aspects of communication skills. *Med Teach.* 2012;34(4):e242-e250.
43. Visser LNC, Hillen MA, Verdam MGE, Bol N, de Haes HCJM, Smets EMA. Assessing engagement while viewing video vignettes; validation of the Video Engagement Scale (VES). *Patient Educ Couns.* 2016;99(2):227-235.
44. Hillen MA, van Vliet LM, de Haes HCJM, Smets EMA. Developing and administering scripted video vignettes for experimental research of patient-provider communication. *Patient Educ Couns.* 2013;91(3):295-309.
45. Lutfey KE, Campbell SM, Renfrew MR, Marceau LD, Roland M, McKinlay JB. How are patient characteristics relevant for physicians' clinical decision making in diabetes? An analysis of qualitative results from a cross-national factorial experiment. *Soc Sci Med.* 2008;67(9):1391-1399.
46. Gehenne L, Christophe V, Eveno C, Carnot A, Turpin A, Pannier D, et al. Creating scripted video-vignettes in an experimental study on two empathic processes in oncology: reflections on our experience. *Patient Educ Couns.* 2021;104(3):654-662.

47. van Vliet LM, Hillen MA, van der Wall E, Plum N, Bensing JM. How to create and administer scripted video-vignettes in an experimental study on disclosure of a palliative breast cancer diagnosis. *Patient Educ Couns*. 2013;91(1):56-64.
48. Mazor KM, King AM, Hoppe RB, Kochersberger AO, Yan J, Reim JD. Video-based communication assessment: development of an innovative system for assessing clinician-patient communication. *JMIR Med Educ*. 2019;5(1):e10400.