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## Assessing significant others' cognitions and behavioral responses in occupational health care for workers with a chronic disease

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### ABSTRACT

**Purpose:** To examine current practices of occupational health professionals in assessing significant others' cognitions and behavioral responses that may influence work outcomes of workers with a chronic disease.

**Methods:** A survey study among occupational health professionals, focusing on the assessment of illness perceptions, work-related beliefs and expectations, and behavioral responses of significant others of workers with a chronic disease. We performed linear regression analyses to investigate which factors are related to occupational health professionals' assessment practices. We used thematic analysis to analyze qualitative data on occupational health professionals' reasons to assess or overlook significant others' cognitions and behavioral responses.

**Results:** Our study sample included 192 occupational health professionals. Most seldom asked about significant others' cognitions and behavioral responses. Organizational norms and occupational health professionals' self-efficacy were related to reported assessment practices. Reasons to assess significant others' cognitions and behavioral responses included recognizing their influence on work participation, and occurrence of stagnation. However, occupational health professionals indicated some doubt whether such assessment would always contribute to better care.

**Conclusions:** It is not common practice for occupational health professionals to assess significant others' cognitions and behavioral responses, although they recognize the influence of these factors on work outcomes. More research is needed as to how occupational health professionals can best address the role of significant others, and apply these new insights in their daily practice.

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### KEYWORDS

Occupational health care; chronic disease; return to work; significant others; survey

### ► IMPLICATIONS FOR REHABILITATION


- Most occupational health professionals do not commonly ask about significant others' cognitions and behavioral responses despite the possible influence of these factors on work outcomes.
- Occupational health professionals may be able to better support workers with a chronic disease by paying more attention to the influence of significant others.
- Aside from asking about practical support, occupational health professionals should consider asking about significant others' illness perceptions, work-related beliefs and expectations, and other behavioral responses.

## Introduction

Significant others (SOs), like partners, family members or friends, can play an important role in work and health outcomes of individuals with a chronic disease [1–4]. SOs can be an important resource to help individuals cope effectively with a chronic disease and to manage their working life [1,4–6], and may therefore be important facilitators of work participation. However, they can also be an important barrier, for example, when SOs believe that return to work will worsen the condition and they pressure the worker to refrain from work [7,8].

Various models have been used to explain how an individual's coping can be influenced by a SO. For example, both the developmental-contextual model and the Systemic Transactional Model are based on the assumption that stressors, such as a chronic illness of one partner, affect both the patient and the partner and that there is interdependence between their stress and coping processes [9]. Both models highlight the importance of appraisals about the stressor and the behavior of both members of the couple under stress to understand individual and dyadic coping processes. This is in line with prior research that

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 Supplemental data for this article can be accessed [here](#).

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indicates that SOs' cognitions (e.g., illness perceptions, beliefs, and attitudes) and behavioral responses (e.g., social support and negative or solicitous responses) can influence how workers cope with chronic disease [10–15]. More specifically, in a recent systematic review, we found that SOs' positive and encouraging attitudes regarding work participation, encouragement and motivating behavior and open communication with workers can facilitate work participation [4]. On the other hand, SOs' positive attitudes towards sickness absence and advise, encouragement or pressure to refrain from work can hinder work participation of workers with a chronic disease. As there is evidence that clinical health care interventions in which SOs are involved are more effective than care in which SOs are not involved [16–19], this may also be beneficial in occupational health care.

The recent shift from a predominantly medical to a biopsychosocial approach indicates that occupational health professionals (OHPs) need to be aware of environmental factors as well as medical and personal factors, as the interaction between these factors has been found to influence functioning and disability [20–23]. Moreover, various multidisciplinary and clinical guidelines advise health professionals to address environmental factors and to involve SOs such as family members in treatment and care [16,17,24–28]. For example, the Scottish guideline "Management of chronic pain" recommends that health professionals assess the influence of family on pain behavior [25], and the Dutch multidisciplinary occupational health guideline "Chronically ill and work" enjoins OHPs to take into account the influence of social support and overprotection by SOs [24].

Until now, the extent to which such guideline recommendations are implemented in daily practice is unclear. In particular, little is known about how often OHPs assess the cognitions and behavioral responses of SOs of workers with a chronic disease, whether they assess particular cognitions or behavioral responses more frequently than others, and what motivates them to assess or overlook these cognitions and behavioral responses. Gaining insight into current practices could provide an empirical basis to improve involvement of SOs in occupational health care and to develop effective interventions to deal with SOs' influences on workers with chronic illnesses.

The first aim of this study was thus to examine to what extent OHPs assess cognitions and behavioral responses of SOs of workers with a chronic disease in their daily practice, and whether they assess certain cognitions or behavioral responses more frequently than others. Secondly, we aimed to determine which factors are related to the assessment of SOs' cognitions and behavioral responses. Third, we aimed to explore why OHPs' either assess or overlook these cognitions and behavioral responses.

## Materials and methods

### Context

Internationally, various types of OHPs are involved in occupational health care to assess work ability, prevent sickness absence, and promote work participation. In the Netherlands, two main types of OHPs play an important role in occupational health care: occupational physicians and insurance physicians [18]. Occupational physicians are generally involved in the first two years of sick leave, during which they provide support and guidance to help employees retain or return to work. When employees have been on sick leave for over two years, they can claim a disability benefit at the Dutch Social Security Institute: the Institute for Employee Benefits Scheme (UWV). For this claim, insurance

physicians assess the functional limitations of the employee due to illness or disability. Self-employed workers cannot claim a disability benefit at the Dutch Social Security Institute, but can choose to insure themselves against occupational disability risks at private insurance companies. For these workers, insurance physicians working in the private sector (medical advisors) assess the functional limitations due to illness or disability, assess disability claims, and provide medical advice regarding injury or illness in relation to work.

### Design and procedure

We conducted a mixed-method cross-sectional survey study among OHPs in the Netherlands, involving a sample of occupational and insurance physicians. In total, 1,719 occupational physicians and 964 insurance physicians were registered on 31 December 2017 by the Registration Committee Medical Specialists of the Royal Dutch Society for the Advancement of Medicine (KNMG) [19]. For distribution of the survey, we cooperated with the Dutch Association of Occupational Medicine (NVAB), the Dutch Association for Insurance Medicine (NVVG), and the Dutch Association of Medical Advisers in Private Insurance (GAV). An invitation letter to participate in this study was distributed by email to all occupational physicians who were members of the NVAB (1,350 occupational physicians) and insurance physicians who were member of the NVVG (668 insurance physicians) and the GAV (231 insurance physicians). The letter included information on the study aim and time needed to complete the survey, as well as privacy, confidentiality, and anonymous processing of the data. It also included a link to the online survey. Approximately three weeks later a reminder was sent. Participants were offered no compensation or reward. The first invitation offered a two-month response time, after which the survey was closed.

Informed consent was obtained at the start of the survey. Inclusion criteria for study participation were as follows: (1) being an occupational or insurance physician, and (2) being involved in return to work or work disability procedures of workers with a chronic disease. Physicians who failed to give informed consent or were not eligible to participate were automatically excluded from further participation. Moreover, participants who indicated working in more than one profession were asked to select one profession, for which they would answer the remaining survey questions. This was because assessment of SOs' cognitions and behavioral responses might differ between professions, for example, due to a different task (i.e., supporting workers to retain or return to work versus assessment of functional limitations due to illness or disability) or phase in the return to work process in which they were involved. The survey included both multiple choice and open questions and took approximately 20–30 min to complete.

The Medical Ethics Review Committee of the University Medical Center Groningen confirmed that because the Medical Research Involving Human Subjects Act (WMO) did not apply to this study official approval by this committee was not required (METc 2017/486, M17.218841).

### Measures

As we were interested in assessment practices of OHPs concerning SOs of workers, we specified SOs as a partner, family members, or friends at the start of the survey. To measure OHPs' current assessment practices, we used three constructs, derived

from our recently published systematic review [4], namely assessment of SOs' (i) *illness perceptions*, (ii) *work-related beliefs and expectations*, and (iii) supportive and unsupportive *behavioral responses*. For all three constructs, items were derived from existing questionnaires and adapted to the purpose of this survey. To reduce the length of the survey, we selected only those items corresponding to SOs' cognitions or behavioral responses which had previously been reported to be related to work participation of workers with a chronic disease [4]. In some cases, we combined multiple items into one. The items for each of the constructs are included in Online Resource 1. Moreover, to measure all items of the constructs we used a 5-point Likert scale (never, rarely, sometimes, often, or always).

We measured OHPs' assessment of SOs' *illness perceptions* using four items on a 5-point Likert scale. We included items regarding perceptions about the subscales "cause" and "control" of the Dutch version of the Brief Illness Perceptions Questionnaire [29] and the subscales "perseverance" and "avoidance" of the Extended Illness Cognition Questionnaire [30]. The internal consistency of the construct was high, with a Cronbach's alpha of .90.

We measured OHPs' assessment of SOs' *work-related beliefs and expectations*, using four items on a 5-point Likert scale. Three items were based on items from the Return-To-Work Self-Efficacy questionnaire (RTWSE-19) [31] and one item was derived from the Work-Related Recovery Expectations Questionnaire [32]. The internal consistency of the construct was high, with a Cronbach's alpha of .90.

We measured OHPs' assessment of SOs' supportive and unsupportive *behavioral responses* towards the worker, using eight items on a 5-point Likert scale. We derived the questions from items of the Sources of Social Support Scale [33] and the Spouse Response Inventory (SRI). The internal consistency of the construct was high, with a Cronbach's alpha of .88.

We also collected descriptives of OHPs (age, gender, profession, employment status, years in practice, and core tasks). We measured OHPs' self-efficacy to address SOs' cognitions and behavioral responses in daily practice using six items on a 5-point Likert scale ranging from strongly disagree to strongly agree. Three items related to OHPs' self-perceived knowledge, skills, and availability of tools to assess SOs' cognitions and behavioral responses on a 5-point Likert scale ranging from strongly disagree to strongly agree. The other three items measured OHPs' self-perceived knowledge, skills, and availability of tools to respond effectively to cognitions and behavioral responses of SOs. The internal consistency of the construct was high, with a Cronbach's alpha of .92. In addition, we measured the organizational norm for assessing SOs' cognitions and behavioral responses by asking OHPs whether they were expected to assess (i) *beliefs and expectations* or (ii) *responses, behaviors, and involvement* of SOs according to the social norm in their organization. Only OHPs who indicated that they were in paid employment were asked to answer these items, as self-employed OHPs are not employed at an organization with colleagues working in the same profession and these items, therefore, did not apply to these OHPs.

Finally, using four open-ended questions we collected data on OHPs' reasons to assess or not to assess SOs' cognitions and behavioral responses. Two questions asked for participants' reasons to assess: (i) *SOs' beliefs and expectations* and (ii) *SOs' responses, behaviors, and involvement*. The other two questions asked participants to state their reasons for not assessing these factors.

The survey was piloted by five OHPs (both occupational and insurance physicians). They were asked to read the invitation

letter, complete the survey, and think about strategies to enhance participation in the survey study. Based on their feedback, we made some small linguistic adaptations in the invitation letter and the survey.

### Data analysis

Quantitative data were analyzed using SPSS version 25 [34]. Descriptive statistics (e.g., frequencies, percentages, means, standard deviations) were used to describe the study sample and to indicate how often OHPs address each of the constructs (SOs' illness perceptions, work-related beliefs, and expectations, or behavioral responses). The Friedman test was used to determine whether OHPs assess certain constructs more frequently than others. *Post-hoc* analyses with Wilcoxon signed-rank tests were conducted to determine where the differences occurred. Sensitivity analyses were performed to determine whether assessment practices differed between occupational and insurance physicians.

To investigate which factors related to OHPs' assessment of SOs' cognitions and behavioral responses, univariate and backward multiple linear regression analyses were performed for each construct. The three constructs were entered as dependent variables. We performed preliminary analyses for each construct to ensure that there was no violation of the assumptions of normality, multicollinearity, and homoscedasticity. The independent variables entered in the models were as follows: (i) gender, (ii) profession, (iii) employment status, (iv) years in practice, (v) core task of the professional, (vi) self-efficacy, and (vii) organizational norm to assess SOs' cognitions (for the two cognitive constructs) or behavioral responses (for the behavioral construct). Dummy variables were created for all variables, except for self-efficacy (continuous variable). To prevent interpretation difficulties, dummy variables belonging to the same variable were entered as a block. After the performance of the univariate linear regressions for each construct, we performed backward multiple linear regressions, entering only those independent variables that were significantly associated with the dependent variable in the univariate regressions ( $p < 0.05$ ). We entered a block of dummy variables in the multiple regressions when at least one dummy variable in the block was significant in the univariate regressions ( $p < 0.05$ ).

To analyze OHPs' responses on the four open-ended questions regarding why they did or did not assess SOs' cognitions and behavioral responses, we used thematic analysis, following the six recommended phases for conducting such analysis [35]. In the first phase, we read and re-read transcripts to become familiar with the data (NCS, HdV). In the second phase, initial codes were generated and data were systematically collated to each code across the entire data (NCS, HdV). In the third phase, codes were collated into potential themes (NCS, HdV). In the fourth phase, the potential themes were reviewed and refined, first on the level of the coded extracts, after which the process was repeated on the level of the entire data set (NCS, HdV). The fifth phase involved generating a definition and name for each theme, and with two additional members of the research team (MH, SB) we checked the final themes. In the final phase, we selected examples of quotes for each theme and described the findings (NCS).

### Results

A total of 241 OHPs agreed to participate in the study (response rate of 10.7%). OHPs who did not respond to all items of at least one of the three constructs (SOs' illness perceptions, work-related

Table 1. Characteristics of participating occupational health professionals ( $N = 192$ ).

| Characteristic  | Total sample ( $N = 192$ )<br>$n$ (%) |
|---|---------------------------------------|
| Gender  |                                       |
| Male  | 116 (60.4)                            |
| Female  | 76 (39.6)                             |
| Age in years (M, SD)  | 56 (7.6)                              |
| Profession  |                                       |
| Occupational physician  | 140 (72.9)                            |
| Insurance physician   | 52 (27.1)                             |
| Core task(s)  |                                       |
| Supporting workers to retain or return to work  | 58 (30.2)                             |
| Assessment of functional limitations due to illness or disability   | 24 (12.5)                             |
| Providing medical advice regarding issues of injury or illness in relation to work  | 4 (2.1)                               |
| Supporting workers and providing medical advice   | 25 (13.0)                             |
| Assessment of functional limitations and providing medical advice   | 6 (3.1)                               |
| Supporting workers and assessment of functional limitations   | 15 (7.8)                              |
| Supporting workers, assessment of functional limitations, and providing medical advice  | 24 (12.5)                             |
| Missing   | 36 (18.8)                             |
| Work experience (years in practice)   |                                       |
| <5  | 9 (4.7)                               |
| 5–10  | 8 (4.2)                               |
| 11–15   | 13 (6.8)                              |
| 16–20   | 39 (20.3)                             |
| >20   | 123 (64.1)                            |
| Employment status   |                                       |
| In paid employment  | 125 (65.1)                            |
| Self-employed   | 60 (31.3)                             |
| Both self-employed and in paid employment   | 7 (3.6)                               |
| Self-efficacy to assess and respond to cognitions and behavioral responses of significant others (M, SD)                                    | 3.39 (.88)                            |
| Organizational norm   |                                       |
| Is it customary within your organization for someone in your profession to assess significant others' responses, behaviors and involvement? |                                       |
| Yes   | 54 (28.1)                             |
| No  | 55 (28.6)                             |
| Not applicable (self-employed)  | 60 (31.3)                             |
| Missing   | 23 (12.0)                             |
| Is it customary within your organization for someone in your profession to assess significant others' beliefs and expectations?             |                                       |
| Yes   | 40 (20.8)                             |
| No  | 70 (36.5)                             |
| Not applicable (self-employed)  | 60 (31.3)                             |
| Missing   | 22 (11.5)                             |

M: mean; SD: standard deviation.

beliefs, and expectations, or behavioral responses) were excluded from the analyses ( $n = 49$ ). The final study sample consisted of 192 OHPs (79.7%). In the group of non-responders, a higher percentage of OHPs were female (53.1 vs. 39.6%) and self-employed (41.5 vs. 31.3%) than in the final study sample. In addition, in the non-response group, a higher percentage worked as insurance physicians and indicated that providing medical advice was their core task (34.7 vs. 27.1%). The majority of the final study sample were male (60.6%) and worked in paid employment (64.8%). Seventy-three percent were occupational physicians and 84 percent indicated having had at least 16 years of work experience, a percentage comparable to the general population of OHPs in the Netherlands [36]. More detailed demographic information of the participants is provided in Table 1.

### Assessment of SOs' cognitions and behavior

Most OHPs reported that they did not frequently ask about SOs' (i) *illness perceptions* (Figure 1), (ii) *work-related beliefs and expectations* (Figure 2), and (iii) *behavioral responses* (Figure 3). They (70.4%) reported frequently (often or always) assessing only practical support, while 8.9–36.5 percent of OHPs frequently assessed the other items. More detailed information about the response distribution within the three constructs is provided in Supplementary Table S1. Sensitivity analyses showed no significant differences between assessment practices of occupational versus insurance physicians.

Comparison of the assessment frequencies of the three constructs indicated a statistically significant difference ( $\chi^2(2) = 99.54$ ,  $p < 0.001$ ). *Post-hoc* analyses showed that OHPs more frequently reported asking about SOs' *behavioral responses* than about their *illness perceptions* ( $Z = -7.12$ ,  $p < 0.001$ ) and *work-related beliefs and expectations* ( $Z = -8.02$ ,  $p < 0.001$ ). Moreover, they more frequently reported asking about SOs' *illness perceptions* than about their *work-related beliefs and expectations* ( $Z = -2.68$ ,  $p < 0.007$ ).

### Factors associated with OHPs' assessment practices

Table 2 shows the results of the univariate and multiple linear regression analyses for OHPs' assessment of the three constructs.

With regard to the construct assessment of SOs' *illness perceptions*, only the variable organizational norm remained in the final multiple regression model, explaining 17.2 percent of the variance ( $F(1, 116) = 24.02$ ,  $R^2 = 0.172$ ,  $p < 0.001$ ). OHPs who regarded it customary within their organization for someone of their profession to ask about SOs' cognitions were more likely to do so themselves.

For the construct assessment of SOs' *work-related beliefs and expectations*, the variables organizational norm, profession and self-efficacy remained in the final multiple regression model, explaining 19.3 percent of the variance ( $F(3, 114) = 9.07$ ,  $R^2 = 0.193$ ,  $p < 0.001$ ). The presence of an organizational norm to assess SOs' cognitions was positively associated with OHPs' reported assessment of SOs' work-related beliefs and



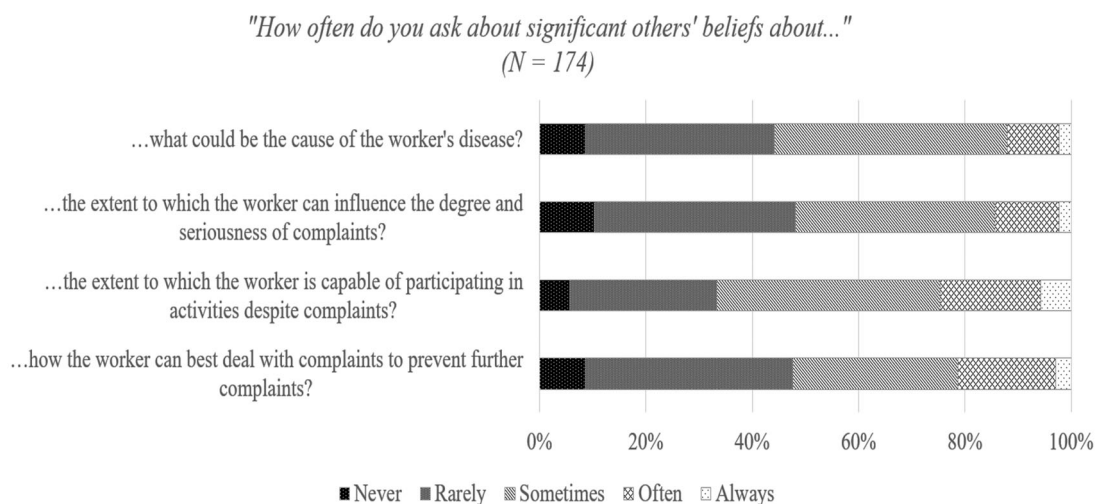


Figure 1. Distribution of responses for assessment of significant others' illness perceptions by occupational health professionals (Median = 2.8, IQR = 2.0–3.0).

*"How often do you ask about significant others' beliefs or expectations about the capability of the worker to..."* (N = 173)

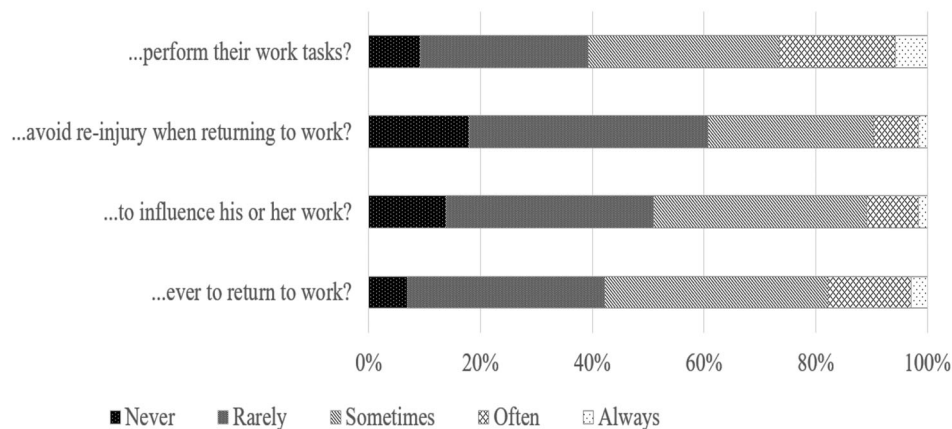


Figure 2. Distribution of responses for assessment of significant others' work-related beliefs and expectations by occupational health professionals (Median = 2.5, IQR = 2.0–3.0).

expectations. In addition, insurance physicians reported asking less frequently about SOs' work-related beliefs and expectations than occupational physicians. Furthermore, OHPs' showed a trend of a positive relation between self-efficacy to address cognitions and behavioral responses of SOs and reported assessment practices. However, this trend was not statistically significant.

With regard to the construct assessment of SOs' *behavioral responses*, the variables organizational norm and years in practice remained in the final multiple regression model, explaining 29.8% of the variance ( $F(5, 119) = 10.09, R^2 = 0.298, p < 0.001$ ). Both variables were positively associated with OHPs' reported assessment of SOs' behavioral responses.

In the final multiple regression models, the presence of an organizational norm was the only variable that significantly contributed to OHPs' assessment practices across all three constructs. However, the inclusion of the organizational norm in the regression analyses considerably reduced our study sample because participating self-employed OHPs did not complete the items on the organizational norm as these items did not apply to them ( $n = 60$ ). We, therefore, conducted additional multivariate regression analyses excluding the variable organizational norm (Table 2, third column).

In the additional analyses, OHPs' self-efficacy was the only variable that significantly contributed to OHPs' assessment practices for all three constructs. OHPs who felt more competent to ask about and effectively respond to SOs' beliefs and expectations or behavioral responses were more likely to assess these factors. Aside from the inclusion of the variable self-efficacy instead of the organizational norm, the final multiple regression models of the additional analyses resembled those of the initial analyses with regard to those variables that remained in the final models. However, the final multiple regression models of the additional analyses explained less of the variance (8.0–15.3%) than did the final multiple regression models of the initial analyses, in which the variable organizational norm was included (17.2–29.8%).

#### **Reasons (not) to ask about SOs' cognitions or behavioral responses**

We defined six themes regarding OHPs' reasons to ask about SOs' cognitions and behavioral responses, and ten themes regarding OHPs' reasons *not* to ask about this. Table 3 provides an overview of the themes, including theme descriptions and illustrative quotes.

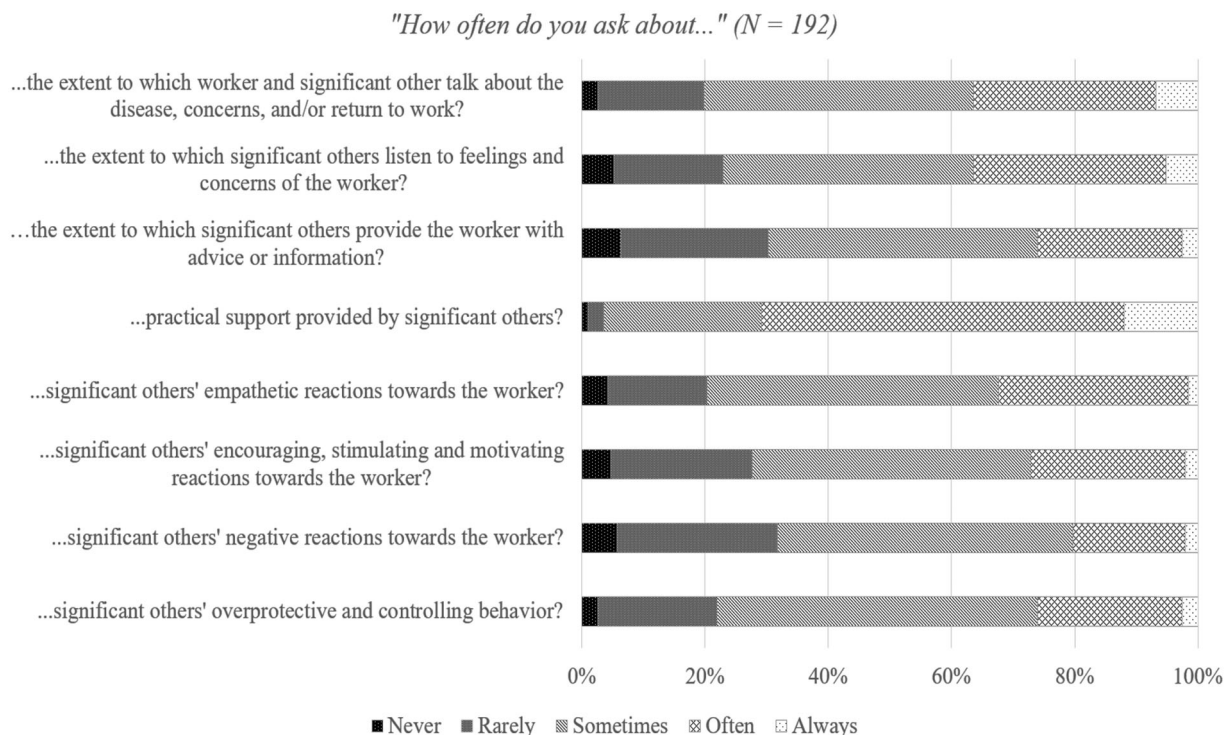


Figure 3. Distribution of responses for assessment of significant others' behavioral responses by occupational health professionals (Median = 3.0, IQR = 2.9–3.5).

A frequently reported reason to *ask* about SOs' cognitions or behavioral responses was to understand the worker's social context and how SOs support or influence him/her because these OHPs already presume that these persons can influence the worker, the recovery, and/or the re-integration process (theme 1). For example, an occupational physician indicated:

It can be an important supportive factor, but it can also play a role in negative cognitions or stagnation of recovery, for example when a significant other is fearful or has many concerns

OHPs also reported asking about SOs' cognitions or behavioral responses to get additional information, for instance about the worker's complaints, functioning and coping (theme 2). OHPs reported being able to use this information as hetero anamneses or as a starting point for more in-depth discussion during consultations, for example, to mobilize the support of SOs or intervene if SOs showed overprotective behavior. For instance, an insurance physician answered:

If the client himself cannot sufficiently put it into words

OHPs further reported asking about significant others' views and reactions in cases of stagnation of some kind (theme 3). To illustrate, an occupational physician stated:

If there is inadequate behavior, recurrent setbacks, and clients are not able or afraid to change their behavior

Moreover, the presence of mental health problems, severe complaints, or coping issues (theme 4) and the presence of an SO during the consultation (theme 5) could lead OHPs to ask about the SO's cognitions and behavioral responses. For example, an insurance physician answered:

In the presence of mental complaints or obvious mourning because of changed life perspective due to the illness

Finally, OHPs reported asking more in depth about the views and reactions of SOs if the topic was raised in the natural course

of the conversation or mentioned by the worker himself (theme 6). To illustrate, an occupational physician reported:

When I get the impression from the conversation (for example after asking about social support or when people indicate something about this themselves) that something is going on here

One reason for OHPs *not to ask* about SOs' views and reactions was that they do not always consider these relevant or likely to improve care (theme 7). For example, when a worker seems to be coping adequately and re-integration is proceeding as expected, OHPs are less inclined to ask about SOs' cognitions and behavioral responses. For example, an occupational physician wrote:

If there is no reason to do so or if the clinical picture is clear and reintegration is proceeding well

OHPs also reported not asking about this due to lack of time (theme 8) or because of giving priority to the worker's perspective instead of that of SOs (theme 9). For instance, an insurance physician stated:

I primarily want to know about the experience of the person concerned

Some OHPs also indicated feeling that an SO would be a disruptive factor in the conversation (theme 10), and that it would be a breach of the worker's privacy to ask about SOs' views and reactions and, moreover, a difficult or sensitive topic to discuss (theme 11). For example, an insurance physician wrote:

When it is expected that the significant other wants to take over the conversation from the person concerned

Furthermore, OHPs reported not asking about the views and reactions of SOs if the latter were not present during the consultation (theme 12). To illustrate, an occupational physician indicated:

In my opinion, you can only ask that to the significant other him- or herself, not to the person concerned. Therefore, in my opinion this is only possible if the significant other is present, and this is more often not the case

Table 2. Univariate and multiple regression analyses for variables predicting OHPs' assessment of significant others' illness perceptions, work-related beliefs and expectations, and behavioral responses.

| Variable   | Univariate regression |       |          | Final regression model (incl. organizational norm) |       |          | Final regression model (excl. organizational norm) <sup>a</sup> |      |          |
|--|-----------------------|-------|----------|--|-------|----------|---|------|----------|
|  | B (95% CI)            | t     | Sig      | B (95% CI)   | t     | Sig      | B (95% CI)  | t    | Sig      |
| Assessment of significant others' illness perceptions (dependent variable)                   |                       |       |          |  |       |          |   |      |          |
| (Constant)   |                       |       |          | 2.43 (2.27, 2.60)                                  | 28.80 | <0.001** | 2.27 (1.63, 2.90)   | 7.05 | <0.001** |
| Gender   |                       |       |          |  |       |          |   |      |          |
| Female   | -0.26 (-0.51, -0.02)  | -2.09 | 0.04*    |  |       |          |   |      |          |
| Male (reference group)   | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Years in practice  |                       |       |          |  |       |          |   |      |          |
| <5 years   | -0.52 (-1.08, 0.03)   | -1.86 | 0.07     |  |       |          |   |      |          |
| 5-10 years   | -0.02 (-0.65, 0.60)   | -0.08 | 0.94     |  |       |          |   |      |          |
| 11-15 years  | -0.30 (-0.81, 0.21)   | -1.15 | 0.25     |  |       |          |   |      |          |
| 16-20 years  | -0.16 (-0.47, 0.16)   | -0.98 | 0.33     |  |       |          |   |      |          |
| >20 years (reference group)  | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Profession   |                       |       |          |  |       |          |   |      |          |
| Insurance physician  | -0.21 (-0.49, 0.06)   | -1.55 | 0.12     |  |       |          |   |      |          |
| Occupational physician (reference group)   | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Employment status  |                       |       |          |  |       |          |   |      |          |
| Self-employed  | 0.11 (-0.16, 0.38)    | 0.82  | 0.41     |  |       |          |   |      |          |
| Both self-employed and in paid employment  | 0.46 (-0.16, 1.09)    | 1.46  | 0.15     |  |       |          |   |      |          |
| In paid employment (reference group)   | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Core task  |                       |       |          |  |       |          |   |      |          |
| Supporting workers to retain or return to work   | 0.12 (-0.10, 0.53)    | 0.55  | 0.58     |  |       |          |   |      |          |
| Providing medical advice regarding issues of injury or illness in relation to work           | -0.08 (-1.07, 0.92)   | -0.15 | 0.88     |  |       |          |   |      |          |
| Supporting workers and providing medical advice  | -0.13 (-0.60, 0.35)   | -0.54 | 0.59     |  |       |          |   |      |          |
| Assessment of functional limitations and providing medical advice                            | 0.59 (-0.29, 1.47)    | 1.33  | 0.19     |  |       |          |   |      |          |
| Supporting workers and assessment of functional limitations                                  | 0.14 (-0.41, 0.70)    | 0.52  | 0.61     |  |       |          |   |      |          |
| Supporting workers, assessment of functional limitations and providing medical advice        | 0.32 (-0.17, 0.81)    | 1.29  | 0.20     |  |       |          |   |      |          |
| Assessment of functional limitations due to illness or disability (reference group)          | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Presence of an organizational norm to assess significant others' beliefs and expectations    |                       |       |          |  |       |          |   |      |          |
| Yes  | 0.71 (0.43, 0.99)     | 4.93  | <0.001** | 0.71 (0.42, 1.00)                                  | 4.90  | <0.001** |   |      |          |
| No (reference group)   | Ref.                  | Ref.  | Ref.     | Ref.   | Ref.  | Ref.     |   |      |          |
| Occupational health professionals' self-efficacy   | 0.24 (0.09, 0.38)     | 3.28  | 0.001**  |  |       |          | 0.22 (0.08, 0.36)   | 3.10 | 0.002**  |
| Assessment of significant others' work-related beliefs and expectations (dependent variable) |                       |       |          |  |       |          |   |      |          |
| (Constant)   |                       |       |          | 1.84 (1.24, 2.45)                                  | 6.00  | <0.001** | 1.26 (0.59, 1.94)   | 3.72 | <0.001** |
| Gender   |                       |       |          |  |       |          |   |      |          |
| Female   | -0.19 (-0.44, 0.07)   | -1.44 | 0.15     |  |       |          |   |      |          |
| Male (reference group)   | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Years in practice  |                       |       |          |  |       |          |   |      |          |
| <5 years   | -0.83 (-1.38, -0.27)  | -2.92 | 0.004**  |  |       |          |   |      |          |
| 5-10 years   | 0.06 (-0.57, 0.68)    | .18   | 0.86     |  |       |          |   |      |          |
| 11-15 years  | -0.23 (-0.74, 0.28)   | -0.88 | 0.38     |  |       |          |   |      |          |
| 16-20 years  | -0.06 (-0.38, 0.25)   | -0.39 | 0.70     |  |       |          |   |      |          |
| >20 years (reference group)  | Ref.                  | Ref.  | Ref.     |  |       |          |   |      |          |
| Profession   |                       |       |          |  |       |          |   |      |          |
| Insurance physician  | -0.33 (-0.61, -0.05)  | -2.36 | 0.02*    | -0.36 (-0.66, -0.05)                               | -2.32 | 0.02*    |   |      |          |
| Occupational physician (reference group)   | Ref.                  | Ref.  | Ref.     | Ref.   | Ref.  | Ref.     |   |      |          |

(continued)



Table 2. Continued.

| Variable   | Univariate regression |       |         | Final regression model (incl. organizational norm) |       |           | Final regression model (excl. organizational norm) <sup>a</sup> |       |          |
|--|-----------------------|-------|---------|--|-------|-----------|---|-------|----------|
|  | B (95% CI)            | t     | Sig     | B (95% CI)   | t     | Sig       | B (95% CI)  | t     | Sig      |
| Employment status  |                       |       |         |  |       |           |   |       |          |
| Self-employed  | 0.01 (-0.26, 0.29)    | 0.11  | 0.92    | -  | -     | -         | -   | -     | -        |
| Both self-employed and in paid employment  | 0.21 (-0.43, 0.85)    | 0.64  | 0.52    | -  | -     | -         | -   | -     | -        |
| In paid employment (reference group)   | Ref.                  | Ref.  | Ref.    | -  | -     | -         | -   | -     | -        |
| Employment status  |                       |       |         |  |       |           |   |       |          |
| Core task  |                       |       |         |  |       |           |   |       |          |
| Supporting workers to retain or return to work   | 0.49 (0.08, 0.90)     | 2.38  | 0.02*   | -  | -     | -         | 0.56 (0.16, 0.95)   | 2.79  | 0.006**  |
| Providing medical advice surrounding issues on injury or illness in relation to work   | 0.11 (-0.88, 1.10)    | 0.22  | 0.83    | -  | -     | -         | 0.09 (-0.86, 1.03)  | .18   | 0.86     |
| Supporting workers and providing medical advice  | 0.19 (-0.28, 0.66)    | 0.82  | 0.42    | -  | -     | -         | 0.18 (-0.27, 0.63)  | .78   | 0.44     |
| Assessment of functional limitations and providing medical advice                      | 0.94 (0.07, 1.82)     | 2.14  | 0.03*   | -  | -     | -         | 0.92 (0.08, 1.75)   | 2.16  | 0.032*   |
| Supporting workers and assessment of functional limitations                            | 0.23 (-0.32, 0.78)    | 0.83  | .41     | -  | -     | -         | 0.32 (-0.21, 0.85)  | 1.21  | 0.23     |
| Supporting workers, assessment of functional limitations and providing medical advice  | 0.51 (0.03, 1.00)     | 2.09  | .04*    | -  | -     | -         | 0.44 (-0.02, 0.91)  | 1.89  | 0.06     |
| Assessment of functional limitations due to illness or disability (reference group)    | Ref.                  | Ref.  | Ref.    | -  | -     | -         | Ref.  | Ref.  | Ref.     |
| Presence of organizational norm to assess significant others' beliefs and expectations |                       |       |         |  |       |           |   |       |          |
| Yes  | 0.66 (0.34, 0.97)     | 4.12  | <.001** | 0.49 (0.16, 0.81)                                  | 2.94  | 0.004**   | -   | -     | -        |
| No (reference group)   | Ref.                  | Ref.  | Ref.    | Ref.   | Ref.  | Ref.      | -   | -     | -        |
| Occupational health professionals' self-efficacy                                       | 0.29 (0.15, 0.43)     | 3.99  | <.001** | 0.21 (-0.03, 0.39)                                 | 2.30  | .02*      | 0.30 (0.13, 0.46)   | 3.51  | 0.001**  |
| Assessment of significant others' behavioral responses (dependent variable)            |                       |       |         |  |       |           |   |       |          |
| (Constant)   |                       |       |         | 3.07 (2.92, 3.22)                                  | 39.98 | < 0.001** | 2.65 (2.30, 3.01)   | 14.64 | <0.001** |
| Gender   |                       |       |         |  |       |           |   |       |          |
| Female   | 0.11 (-0.07, 0.29)    | 1.17  | .24     | -  | -     | -         | -   | -     | -        |
| Male (reference group)   | Ref.                  | Ref.  | Ref.    | -  | -     | -         | -   | -     | -        |
| Years in practice  |                       |       |         |  |       |           |   |       |          |
| <5 years   | -0.50 (-0.92, -0.09)  | -2.40 | 0.02*   | -0.54 (0. -0.93, -16)                              | -2.77 | 0.006*    | -0.52 (-0.92, -0.11)  | -2.50 | 0.01*    |
| 5-10 years   | -0.64 (-1.08, -0.21)  | -2.90 | 0.004** | -0.73 (-1.17, -0.29)                               | -3.32 | 0.001**   | -0.67 (-1.10, -0.24)  | -3.06 | 0.003**  |
| 11-15 years  | -0.29 (-0.64, 0.06)   | -1.64 | 0.10    | -0.44 (-0.91, 0.03)                                | -1.87 | 0.06      | -0.25 (-0.61, 0.11)   | -1.37 | 0.17     |
| 16-20 years  | -0.29 (-0.51, -0.07)  | -2.55 | 0.01*   | -0.33 (-0.60, -0.07)                               | -2.48 | 0.01      | -0.28 (-0.50, -0.06)  | 2.51  | 0.01*    |
| >20 years (reference group)  | Ref.                  | Ref.  | Ref.    | Ref.   | Ref.  | Ref.      | Ref.  | Ref.  | Ref.     |
| Profession   |                       |       |         |  |       |           |   |       |          |
| Insurance physician  | -0.15 (-0.35, 0.05)   | -1.45 | 0.15    | -  | -     | -         | -   | -     | -        |
| Occupational physician (reference group)   | Ref.                  | Ref.  | Ref.    | -  | -     | -         | -   | -     | -        |
| Employment status  |                       |       |         |  |       |           |   |       |          |
| Self-employed  | 0.02 (-0.18, 0.22)    | 0.20  | 0.84    | -  | -     | -         | -   | -     | -        |
| Both self-employed and in paid employment  | 0.21 (-0.27, 0.70)    | 0.86  | 0.39    | -  | -     | -         | -   | -     | -        |
| In paid employment (reference group)   | Ref.                  | Ref.  | Ref.    | -  | -     | -         | -   | -     | -        |
| Core task  |                       |       |         |  |       |           |   |       |          |
| Supporting workers to retain or return to work   | 0.30 (-0.002, 0.61)   | 1.96  | 0.05    | -  | -     | -         | -   | -     | -        |
| Providing medical advice regarding issues on injury or illness in relation to work     | 0.38 (-0.31, 1.06)    | 1.09  | 0.28    | -  | -     | -         | -   | -     | -        |
| Combination of supporting workers and providing medical advice                         | 0.28 (-0.09, 0.64)    | 1.51  | 0.13    | -  | -     | -         | -   | -     | -        |
| Combination of assessment of functional limitations and providing medical advice       | 0.06 (-0.51, 0.64)    | 0.22  | 0.83    | -  | -     | -         | -   | -     | -        |
| Combination of supporting workers and assessment of functional limitations             | 0.38 (-0.04, 0.79)    | 1.79  | 0.08    | -  | -     | -         | -   | -     | -        |

(continued)

Table 2. Continued.

| Variable  | Univariate regression |      |          | Final regression model (incl. organizational norm) |      |          | Final regression model (excl. organizational norm) <sup>a</sup> |      |         |
|---|-----------------------|------|----------|--|------|----------|---|------|---------|
|   | B (95% CI)            | t    | Sig      | B (95% CI)   | t    | Sig      | B (95% CI)  | t    | Sig     |
| Combination of supporting workers, assessment of functional limitations and providing medical advice  | 0.33 (-0.04, 0.69)    | 1.78 | 0.08     | -  | -    | -        | -   | -    | -       |
| Assessment of functional limitations due to illness or disability (reference group)                   | Ref.                  | Ref. | Ref.     | -  | -    | -        | -   | -    | -       |
| Presence of an organizational norm to assess significant others' behaviors, reactions and involvement | 0.53 (0.32, 0.73)     | 5.05 | <0.001** | 0.51 (0.31, 0.71)                                  | 5.00 | <0.001** | -   | -    | -       |
| Yes   | Ref.                  | Ref. | Ref.     | Ref.   | Ref. | Ref.     | -   | -    | -       |
| No (reference group)  | 0.18 (0.08, 0.29)     | 3.52 | 0.001**  | -  | -    | -        | 0.18 (0.08, 0.28)   | 3.53 | 0.001** |
| Occupational health professionals' self-efficacy  |                       |      |          |  |      |          |   |      |         |

\* $p < 0.05$ ; \*\* $p < 0.01$ .<sup>a</sup>Model summary assessment of significant others' illness perceptions is  $F(2, 169) = 7.30$ ,  $R^2 = 0.080$ ,  $p = 0.001$ ; model summary assessment of significant others' work-related beliefs and expectations is  $F(7, 132) = 3.40$ ,  $R^2 = 0.153$ ,  $p = 0.002$ ; model summary assessment of significant others' behavioral responses is  $F(5, 178) = 6.41$ ,  $R^2 = 0.153$ ,  $p < 0.001$ .

In addition, OHPs reported not always needing to ask specific questions because certain topics were sometimes raised naturally (theme 13). Others reported not asking unless the topic was brought up during the consultation (theme 14). Finally, OHPs reported not always thinking of asking about SOs' views and reactions (theme 15), and not always having a specific or conscious reason not to ask about these factors (theme 16). For example, an insurance physician answered:

Never a conscious reason not to do it, actually

## Discussion

In this mixed method survey study, we aimed to examine current practices of OHPs in the assessment of SOs' cognitions and behavioral responses that could influence work outcomes of workers with a chronic disease. Our findings indicate that most OHPs do not commonly ask about SOs' illness perceptions, work-related beliefs, and expectations, and behavioral responses, despite the possible influence of these factors on work outcomes, as well as guideline recommendations to address social factors in occupational health care. Although OHPs did report to frequently assess practical support by SOs, this was not the case for other behavioral responses and cognitions of significant others. These reported assessment practices were related to both organizational norms and OHPs' self-efficacy to address these factors. Furthermore, OHPs reported multiple reasons for asking or not asking about these issues; their answers to the open-ended questions indicate that they do not always find it necessary to ask, either because recovery and re-integration are going well or because they see no indication that SOs have a strong influence. However, in the presence of mental health problems, severe complaints, coping issues and stagnation of the re-integration process, OHPs do seem more inclined to inquire about SOs' cognitions and behavioral responses.

There are several possible explanations for most OHPs' low assessment frequency of SOs' cognitions and behavioral responses. First, OHPs may often feel that asking about this would not contribute to better care, and indeed our results indicate that OHPs feel that this is beneficial only under certain circumstances. Studies in other fields have also suggested that the effectiveness of involving SOs in interventions may depend on circumstances or conditions such as gender, illness severity, and whether or not the significant other is unsupportive prior to intervention [37–39]. This could also be the case for occupational health care. However, more research on this is needed.

Moreover, our results indicate a relationship between OHPs' assessment practices and their self-efficacy to assess and effectively respond to SOs' cognitions and behavioral responses. Although family interventions and education and training programs on the involvement of SOs are available for mental health care professionals [40,41], this is not the case for OHPs. Moreover, no tools or instruments are currently available for OHPs to assess and intervene on SOs' illness perceptions, work-related beliefs and expectations, and behavioral responses. This lack of available education, interventions, tools, and clear guidelines may thus partly explain OHPs' lack of attention to these factors.

Barriers within OHPs' organizations may also partially explain why OHPs do not frequently assess SOs' cognitions and behavioral responses. Several OHPs reported lack of time and the absence of a significant other during the consultation as reasons not to ask about this. Moreover, the organizational norm appears to play an important role, which is in line with other studies that

**Table 3.** Description of qualitative data on occupational health professionals' reasons whether or not to ask about significant others' cognitions and behavioral responses.

| Theme  | Theme description   | Illustrative quotes from occupational physicians (OP) and insurance physicians (IP)  |
|--|---|--|
| A. Occupational health professionals' reasons to ask about cognitions and behavioral responses of significant others <sup>a</sup>            |   |  |
| 1. Significant others as influential factor  | To gain insight into the worker's illness, functioning and social context, because additional information is needed or because of a general awareness or observation that significant others influence the worker, and his/her recovery and re-integration. | <p>"Because this can co-determine the prognosis" (OP)</p> <p>"If I have the impression that significant others slow the worker down in his resumption of work" (OP)</p> <p>"If you notice that they have an obvious influence, for example when discussing a plan to resume work" (OP)</p> <p>"It can be an important supportive factor, but it can also play a role in negative cognitions or stagnation of recovery, for example when a significant other is fearful or has many concerns" (OP)</p> <p>"To get an impression of the extent to which the person concerned is influenced in his or her recovery and re-integration process" (OP)</p> <p>"Because it is known that significant others have a very great influence on absenteeism and the recovery behavior of people" (OP)</p> <p>"Because they can contribute to recovery and participation, but can also inhibit this process" (IP)</p> |
| 2. Significant other as conversation partner   | To get additional information about the situation, complaints, coping, and social context of the worker, or to use this information as starting point for more in-depth discussion during the consultation.   | <p>"That gives extra information. Hetero anamnesis. Especially when I observe that the significant other has a different opinion than that of the client. This way I receive additional information about: illness insight, level of functioning, degree of support, understanding, interactions at home" (IP)</p> <p>"If I get insufficient information directly from the worker" (OP)</p> <p>"If the client himself cannot sufficiently put it into words" (IP)</p> <p>"Once in a while, if they can give clarification during the consult" (OP)</p> <p>"To gain insight into the social context" (IP)</p> <p>"To check whether expressions of employees are recognized by the partner or significant other. 'Do you also think it is going better with the person concerned?' 'Do you also notice that ...'" (OP)</p>   |
| 3. In response to stagnation of recovery or re-integration   | To investigate observed stagnation of recovery, re-integration, or behavioral change.   | <p>"If there is inadequate behavior, recurrent setbacks, and clients are not able or afraid to change their behavior" (OP)</p> <p>"Presence of expressions of avoidance and stagnation in recovery and re-integration" (OP)</p> <p>"Because of stagnation in recovery" (OP)</p>  |
| 4. Depending on disease characteristics and coping   | Because of the characteristics of the disease (e.g., health conditions like mental health or cognitive problems, high complexity or severity), consequences of the disease or coping issues.  | <p>"This depends on the disease. With certain diseases, for example after a myocardial infarction, concern of significant others can influence how a sick employee copes with his complaints. Or with an employee with a burnout, because significant others sometimes have an outspoken opinion. In general when it concerns work-related complaints" (OP)</p> <p>"In the presence of mental complaints or obvious mourning because of changed life perspective due to the illness" (IP)</p> <p>"If someone has complaints to the extent that extra support at home could be helpful for recovery or perseverance" (OP)</p> <p>"To assess the coping mechanisms of the insured worker" (IP)</p> <p>"If there are complex problems" (OP)</p> <p>"... more often with psychological complaints, because then the beliefs of significant others have more influence" (OP)</p>                              |
| 5. Presence of significant other during consultation   | Occupational health professional takes advantage of presence of significant others at consultations.  | <p>"If they are present during the consult and I have the feeling that some of the not-helpful thoughts originate from the partner" (OP)</p> <p>"Primarily when someone has low work ability or is vulnerable and the partner is present and I check with that person if he sees it the same way" (OP)</p>   |
| 6. Topic raised within the natural course of the conversation  | To discuss significant others' cognitions and behavioral responses more in depth if topic is raised in natural course of conversation or is mentioned by the worker.  | <p>"I incidentally ask about this if someone raises this topic themselves, but usually this already becomes clear from the behavior of the significant others (I often do ask about this)" (IP)</p> <p>"When this is brought forward in a negative sense" (OP)</p> <p>"I ask about it if an employee comes to me with advice from his or her partner. This can be positive, or very protective" (OP)</p> <p>"When I get the impression from the conversation (for example after asking about social support or when people indicate something about this themselves) that something is going on here" (OP)</p>   |
| B. Occupational health professionals' reasons <i>not</i> to ask about cognitions and behavioral responses of significant others <sup>b</sup> |   |  |
| 7. No contribution to better care or assessment  | Would not contribute to better care or assessment, or is not considered a relevant topic.   | <p>"If it is clear that they give adequate support" (OP)</p> <p>"If recovery is going well, in line with expectations" (OP)</p> <p>"This is not relevant for assessment of functional capacity of an employee" (OP)</p> <p>"If the client himself is sufficiently capable to put it into words" (IP)</p> <p>"This might cause confusion. If you get this information, what do you do with it as insurance physician? How do you weigh this information? Why would you ask about this if you do not plan to do anything with it. You can</p>  |

(continued)

Table 3. Continued.

| Theme  | Theme description  | Illustrative quotes from occupational physicians (OP) and insurance physicians (IP)  |
|--|--|--|
|  |  | write down: illness-sustaining factors in the home environment. Which you cannot influence as insurance physician" (IP)  |
| 8. Lack of time  | Not enough time to ask about significant others' cognitions and behavioral responses in addition to other topics to be discussed during consult.   | "If this does not contribute to re-integration or is not necessary for achieving re-integration goals" (OP)<br>"In case of uncomplicated recovery or obvious adequate coping" (OP)<br>"If I lack time for it or forget it" (OP)<br>"No time, not of first interest" (IP)<br>"It is not yet in my system. In part it is due to lack of time" (OP)<br>"Lack of time" (OP)  |
| 9. Focusing primarily on the worker's perspective  | Giving priority to other topics related to experiences and perspectives of the worker.   | "Because I want to know the opinion of the person concerned" (IP)<br>"I primarily want to know about the experience of the person concerned" (IP)<br>"In particular, own motivation is important, significant others do not accompany employees to work" (IP)<br>"I do not think those perceptions and expectations in itself influence the employee, rather how the employee him- or herself experiences it" (IP)<br>I initially rely on what the person involved says. If that fits within an activating approach, then I don't see much added value from inquiring about the response from the environment. (OP)  |
| 10. Disruptive or hindering influence of significant others                                      | Expectations or fear that asking about significant others' cognitions and behavioral responses would disrupt the conversation and have negative consequences for worker and re-integration.                | "They are often overly concerned" (OP)<br>"Sometimes a significant other is involved in a "wrong" way. Too dominant, disrupting the conversation; a significant other can be a causal factor in the disease process. Then I have already seen the interaction between those two. In that case, the significant other only disrupts the conversation and reduces the quality of the information from the client (e.g., is afraid to speak openly)" (IP)<br>"When it is expected that the significant other wants to take over the conversation from the person concerned" (IP)<br>"If I think this would only uncover more claim behavior, without actual information. Then it would be better if I delve deeper into the underlying emotion instead of focusing on the content" (IP) |
| 11. Sensitive or difficult topic to discuss  | Feelings that cognitions and behavioral responses of significant others might be a sensitive topic for workers or that this is a difficult topic to discuss.   | "To preserve good relations with the sick worker" (OP)<br>"When this is too sensitive" (IP)<br>"If the employee is not open to this" (OP)<br>"Sometimes I do not ask, to avoid discussion or conflict" (IP)<br>"... sometimes also because it is painful if there is no significant other available" (OP)<br>"Privacy, if it does not matter" (IP)<br>"Resistance or discomfort of the client" (OP)  |
| 12. Absence of significant others  | Lack of opportunity due to absence of significant others during consultation or because workers do not always have a significant other.  | "In my opinion, you can only ask that to the significant other him- or herself, not to the person concerned. Therefore, in my opinion this is only possible if the significant other is present, and this is more often not the case" (OP)<br>"Because significant others are often not present during the conversation" (OP)<br>"If a sick worker is single" (OP)<br>"They are not always present" (IP)   |
| 13. Topic is discussed without the need to ask specific questions                                | Significant others' cognitions and behavioral responses are discussed in some other way, without the occupational health professional specifically asking about them.                                      | "It is often spontaneously discussed, and I more consciously ask about it if there are signals" (OP)<br>"If the sick employee has already brought it up" (OP)<br>"I invite clients to tell something about their private situation, but do not explicitly ask about reactions, behaviors and involvement of significant others" (OP)<br>"Sometimes it is already clear or spontaneously reported" (IP)   |
| 14. Topic is not brought up  | Significant others' cognitions and behavioral responses are not brought up by the worker nor does this topic arise spontaneously during the consult.   | "Sometimes it just does not come up" (OP)<br>"If it does not come to it" (IP)<br>"If the person concerned never tells something about his significant others" (OP)   |
| 15. Asking about cognitions and behavioral responses of significant others does not come to mind | The occupational health professionals does not think to ask about significant others' cognitions and behavioral responses during consults, or it has never occurred to the professional to ask about this. | "I don't always think about it" (OP)<br>"I don't think about it" (OP)<br>"There are already so many things to ask. It never occurred to me to ask this as well" (OP)<br>"Did not come up with the idea before and often there is already sufficient information from the person concerned" (OP)  |
| 16. No reason  | No specific or conscious reason.   | "No idea. I do not pay enough attention to this" (OP)<br>"No specific reason" (IP)<br>"No good reason actually; I should do this more often" (OP)<br>"Never a conscious reason not to do it, actually" (IP)<br>"Not with any particular reason" (OP)   |

<sup>a</sup>Total of 122 OHPs responded to open question about reasons to ask about *significant others' beliefs and expectations*. 131 OHPs responded to open question about reasons to ask about *significant others' responses, behaviors and involvement*.

<sup>b</sup>Total of 119 OHPs responded to open question about reasons not to ask about *significant others' beliefs and expectations*. 104 OHPs responded to open question about reasons not to ask about *significant others' responses, behaviors and involvement*.

indicate that perceived social norms can influence intentions, decision making, and behaviors of health professionals [42–45]. Organizations could facilitate the involvement of SOs by making it common practice to invite them to attend one or more consultations and by providing OHPs with more time and resources. It is thus important for organizations to recognize the importance of involving SOs in occupational health care.

Barriers in the occupational health care system may be another explanation for the low assessment frequencies. For example, although multiple Dutch occupational health guidelines recommend that OHPs address factors in the social environment [24,17,46,47], each guideline specifies only a few relevant factors (e.g., overprotection, social support, irrational fears or beliefs that hinder recovery). This might be due to the lack of quantitative evidence on the influence of specific cognitions and behavioral responses of SOs on work outcomes, as most research available on this topic is qualitative. Therefore, a higher level of evidence requires more quantitative research [4].

### **Strengths and limitations**

A strength of this study is our use of a mixed-method design to collect both quantitative and qualitative data in a representative population of OHPs. The invitation letter and link to the survey were distributed through the three largest professional associations for occupational and insurance physicians in the Netherlands, potentially reaching more than 80 percent of Dutch OHPs [36,48]. Although the estimated response rate of this study was low (10.7%), our sample appears to be a good reflection of the total population of Dutch OHPs registered as of 1 January 2016, with regard to age, gender, and proportion of occupational versus insurance physicians [36]. Moreover, we derived the items of our survey from validated questionnaires, and all constructs had high internal consistencies.

As this study took place within the Dutch occupational health care system and was explorative in nature, the generalizability of our results is limited. To the best of our knowledge, similar studies have not been conducted in other countries; as a result, the extent to which OHPs in other countries pay attention to SOs' cognitions and behavioral responses remains unknown. Our results can therefore not be compared to other findings.

Furthermore, as OHPs' self-reported practices may not accurately represent their actual practices, a social desirability bias must also be considered. Although our results indicate that OHPs seldom assess SOs' cognitions and behavioral responses, an even smaller frequency may be possible. However, our survey focused on specific illness perceptions, work-related beliefs and expectations, and behavioral responses of SOs that could influence work participation; while many OHPs may not ask about these specific factors, they may address social factors in other ways, for example, by asking more in general about a worker's social context.

### **Implications and recommendations for future research and occupational health practice**

This study provided insight into OHPs' practices and their perspectives as to the involvement of SOs in occupational health care, including a number of implications for occupational health practice. In addition, we have several recommendations for future research.

First, it is important to better understand the perspectives of different stakeholders on involving SOs in occupational health

care and methods to implement SO involvement in daily practice. Such insight can provide an empirical basis for recommendations on how to involve SOs in occupational health care. Such information could also be used in the development of training programs and tools for this purpose. Future research should, therefore, focus on gaining more insight into this topic from the perspective of OHPs, as well as that of workers with a chronic disease and their SOs.

Our findings furthermore suggest that the benefits of assessing SOs' cognitions and behavioral responses may depend on various contextual and case-specific factors (e.g., re-integration versus claim assessment, complexity of the case, and re-integration progress). These findings are in line with prior research in other fields which has also pointed to possible other factors influencing the effectiveness of involving SOs in interventions: factors like gender, illness severity, and lack of support [37–39]. However, more research on this question is needed. Moreover, because of important implications for practice, such future research should focus on exploring which factors determine the relevance of involving SOs.

### **Conclusions**

Our study shows that OHPs do not commonly assess SOs' cognitions and behavioral responses, despite recognizing that these factors can influence work outcomes. Both the organizational norm and OHPs' self-efficacy appear to play a role in their decisions. Qualitative data showed that one important reason for OHPs not to ask about SOs' cognitions and behavioral responses is that recovery and re-integration are going well. Nevertheless, OHPs are more inclined to ask about this when perceiving mental health problems, severe complaints, coping issues and/or stagnation of the re-integration process. Our findings indicate that OHPs may be able to better support workers with a chronic disease in their self-management and ability to work by paying more attention to the influence of SOs. However, more research is needed on how to address SOs' cognitions and behavioral responses and to determine which circumstances influence the effectiveness of involving others in occupational health care.

### **Ethical approval**

This study is exempted from ethical approval by the Medical Ethics Review Committee of the University Medical Center Groningen (METc 2017/486, M17.218841). Informed consent was obtained from all individual participants included in the study.

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## Data availability

The dataset generated during this study is available from the corresponding author upon reasonable request.

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