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Use of a mental health guideline by occupational physicians and associations with return to work in workers sick-listed due to common mental disorders: a retrospective cohort study

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ABSTRACT

Purpose: The aim of this study was to evaluate (1) whether adherence to the Dutch occupational mental health guideline by occupational physicians was associated with time to return to work in workers sick-listed due to common mental disorders; and (2) whether adherence to specific guideline items was associated with time to return to work.

Methods: Twelve performance indicators were developed to assess occupational physicians' guideline adherence. Medical records of 114 sick-listed workers were audited. Performance indicators were scored as indicating no (0), minimal (1) or adequate adherence (2). Cox regression analysis was used to assess the association between guideline adherence and first or full return to work.

Results: Guideline adherence was predominantly minimal on most performance indicators. This low overall adherence was not associated with first return to work (Hazard Ratio 1.07, $p = 0.747$) or with full return to work (Hazard Ratio 1.25, $p = 0.301$). Only one performance indicator (regular contact between occupational physician and employer) was significantly associated with earlier full return to work (Hazard Ratio 1.87, $p = 0.021$).

Conclusions: Overall, the guideline adherence of occupational physicians was not related to earlier return to work. However, there was considerable room for improvement in guideline use. Whether this leads to earlier return to work is still an unanswered question.

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► IMPLICATIONS FOR REHABILITATION

- Adherence of occupational physicians to an evidence-based occupational mental health guideline was low.
- Regular contact between occupational physician and employer was associated with earlier full return to work in workers with common mental disorders.
- It is important to focus on how implementation problems and barriers for guideline use can be overcome, in order to improve the quality of occupational mental health care and to potentially reduce sickness absence duration in workers with common mental disorders.

Introduction

Considering the fact that in many countries mental health problems account for high numbers of sick-listed workers [1–3], it is surprising that, so far, very few evidence-based guidelines exist in the occupational health care context worldwide [4]. Medical evidence-based practice guidelines are considered to be effective tools to improve the quality of care, including occupational health care [5,6]. In the Netherlands, seven guidelines for professionals exist that focus on the management of workers with mental health and stress issues [4]. Some of these guidelines are interdisciplinary [7], whereas others focus on specific professionals such as occupational physicians [8] or psychologists [9,10].

Specifically, for occupational physicians, the Netherlands Society of Occupational Medicine developed (2000) and revised (2007) an evidence-based practice guideline named 'Management of mental health problems of workers by occupational physicians' [8,11]. This guideline was distributed among Dutch occupational physicians, and it became part of their continuing medical education.

The evidence-based occupational mental health guideline promotes an active approach by the occupational physician in monitoring and enhancing the problem solving capacity of the worker, aiming to establish early and sustained work resumption [8,11]. Previous research supports the effectiveness of the methods incorporated in the guideline [12,13]. However, research on the use of

Table 1. Summary of the Dutch occupational mental health guideline [8].

Part of the guideline	Content
1 Problem orientation and diagnosis	An early involvement of the occupational physician in the sick leave process of the worker is promoted (first consultation within 2 weeks after the worker reports sick). A simplified classification of mental health problems is introduced in four categories: (i) stress-related complaints, (ii) depression, (iii) anxiety disorder, and (iv) other psychiatric disorders. Furthermore, problem inventory should focus on factors related to the worker, his or her work environment, and the interaction between these two.
2 Intervention/Treatment	The occupational physician acts as a case manager by monitoring and evaluating the recovery process. If recovery stagnates the occupational physician should intervene by acting as care manager by using cognitive behavioral techniques to enhance the problem-solving capacity of the worker, providing the worker and the work environment with information and advice on the recovery and the return to work process, contact the general practitioner when problems remain the same or increase, and refer the worker to a specialized intervention if necessary. In addition, the occupational physician should advise the work environment (e.g. supervisors, managers, human resource managers) on how to support the worker and support the recovery and return to work process.
3 Relapse prevention	Integration of relapse prevention from the first contact with the worker by enhancing the problem-solving capacity of the worker. The newly acquired problem solving skills are explicitly addressed in at least one specific relapse prevention meeting after return to work.
4 Continuity of care/Evaluation	During all meetings, evaluation of the recovery process includes the perspectives of the worker, supervisor, and other involved professionals. Follow-up meetings with the worker should take place every 3 weeks during the first 3 months, and every 6 weeks thereafter. The supervisor or work environment should be contacted once a month. Follow-up contacts with the general practitioner or other professionals should take place when the recovery process stagnates or when there is doubt about the diagnosis or treatment.

the first edition of this Dutch occupational mental health guideline showed that, in general, the guideline adherence by occupational physicians was limited [14–16] and that a three-day training for occupational physicians did not shorten the time to return to work [15]. This, despite the fact that occupational physicians' attitudes toward the first edition of this guideline were found to be fairly positive [17] and that some promising associations were found between better guideline adherence by occupational physicians and reduced sickness absence duration in workers with adjustment disorders [16]. The impact of guideline use on return to work in workers sick-listed due to common mental disorders had never been evaluated after the guideline was revised in 2007, despite the fact that it has now been used in practice for 10 years. Therefore, the focus of the present study was on the associations between occupational physicians' guideline adherence and workers' return to work.

Specifically, the present study addressed the following research questions: (1) Is better guideline adherence by occupational physicians associated with earlier return to work in workers with common mental disorders? (2) Which specific guideline items are associated with earlier return to work?

Methods

Study context

In the Netherlands, the Dutch Gatekeeper Improvement Act [18] holds both employer and worker responsible for the recovery and the return to work of the sick-listed worker, and both parties risk financial fines. The employer is obliged to pay at least 70% of the wages for a period of two years after the start of the sickness absence period, during which time sick-listed workers cannot have their employment terminated. The employer is also obliged to provide access to occupational health care for the sick-listed worker, and to make work adaptations if necessary. Employers contract an independently operating occupational health service or an independent occupational physician. The occupational physician has a central role in the Dutch social security system, he/she guides the worker during the recovery and the return to work process, and he/she gives advice to the employer. The occupational physician should monitor the recovery and the return to work process, and document this in the worker's medical record.

Guideline-based care

The central aim of the guideline is early and sustained work resumption of workers sick-listed due to mental health problems. The guideline consists of four consecutive steps [8], as described in Table 1.

Study subjects and procedure

The data of the current study were gathered as part of a larger study, a cluster-randomized controlled trial, examining the effect of an intervention to enhance guideline adherence in occupational physicians [19]. In the larger study, the inclusion criteria were: age 18–64 years, a first period of sickness absence between January 1st 2012 and January 15th 2013, receiving guidance by an occupational physician who participated in the study and who had diagnosed that mental health problems were the primary reason for sick absence (according to the Dutch Classification of Diseases, based on the ICD-10 [20], and adequate mastery of the Dutch language). Exclusion criteria were: being suicidal, and a physical problem being the primary reason for sickness absence. In the larger study, 116 workers gave their written informed consent for auditing their medical records and using their sickness absence data. The data from 114 of these 116 workers guided by 34 occupational physicians were available for the present study. One record was not available at the occupational health service, and the audit of another record revealed that mental health problems were not the primary reason for sickness absence. In addition to the medical records, participating workers had filled out a baseline questionnaire for the larger study, from which some data were used in the analyses to check for potential confounders (see: *potential confounders*). Participating occupational physicians were not informed about which workers were included in the study, although they did know which workers were being invited to participate (about 500 workers in total).

The data on the sickness absence and the return to work of the 114 workers were retrospectively obtained from the registration system of the occupational health service 1.5 years after the last worker was included in the trial. The audited period in the medical records was 12 months from the first day of the sickness absence of each worker.

Ethical approval was provided by the Medical Research Ethics Committee of St. Elisabeth Hospital in Tilburg (MREC number 1162). Trial registration: ISRCTN86605310.

Measures

Guideline adherence

We developed a set of 12 guideline-based performance indicators (PIs) to assess occupational physicians' guideline adherence as documented in the workers' medical records, as one of the guideline recommendations is that occupational physicians should document their findings in the medical records (see Table 2). The PIs were systematically developed using an iterative consensus rating procedure for deriving indicators from guidelines [21–24]. First, the 24 most important guideline recommendations that would have an impact on the quality of occupational care were independently preselected by three experts (an occupational physician, a psychologist, and a researcher). Second, in an expert meeting, nine experts with expertise on mental health, occupational health, and quality of care, discussed the relevance of the 24 recommendations for occupational physicians' performance. This resulted in a selection of 20 recommendations categorized in five key recommendations. Finally, from each selected recommendation, a PI was created. For instance, from the recommendation that relapse prevention is an important part of the guidance, the PI 'Relapse prevention' was created. This PI could be scored in the medical record as 0 (no attention had been given to relapse prevention as based on the medical record), 1 (minimal attention had been given) or 2 (relapse prevention had adequately been addressed during guidance). Two researchers pilot tested the PIs and scoring set by auditing ten medical records. Based on their findings, the PIs were adapted to the final set of 12 PIs categorized in five key indicators [Joosen et al., submitted] (see Table 3).

The PIs were rated as 0 (no guideline adherence), 1 (minimal adherence) or 2 (adequate adherence). The difference between minimal and adequate adherence represented, for most of the PIs, a difference in how often a PI was documented or the extent of argumentation why certain actions were taken or not taken by the occupational physician. Because there were too few medical records showing adequate adherence, post hoc, the audit ratings were dichotomized by collapsing 'minimal adherence' (score 1) and 'adequate adherence' (score 2) into one category of 'minimal-to-adequate adherence'. Overall, guideline adherence was dichotomized by using the median score of the sum score of all performance indicators (scale range 0–24) as cut off score.

Two researchers independently audited the anonymized medical records. The auditors were blinded for the identity of the occupational physicians and their group allocation. In case of no consensus, a third researcher audited the medical record and decided on the final PI score. Table 3 shows the distribution of the PI scores for the intervention and control groups.

Return to work

Time to *first* return to work was calculated as the number of calendar days between the first day of sickness absence and the first day of return to work, irrespective of the number of working hours per week and the occurrence of sickness absence relapses. Time to *full* return to work was calculated as the number of calendar days between the first day of sickness absence and the first day of full return to work. Full return to work was defined as working the number of hours of their employment contract, for at least 4 consecutive weeks.

Potential confounders

As this study was part of a larger study, more data on the participants were available than from just the medical records.

Therefore, to check for possible confounding, some of these data were used. They concerned age, gender, severity of distress, depression, anxiety and somatization (measured by the Four-Dimensional Symptom Questionnaire (4-DSQ)) [25], work-related self-efficacy (measured by the return to work self-efficacy (RTW-SE) scale) [26], and perceived workability (measured using a single question of the workability index (WAI)) [27,28]. These data were measured at baseline within 13 weeks after the start of the sickness absence. More detailed information about this questionnaire have been described elsewhere [19].

Statistical analyses

Guideline adherence

Descriptive analyses were used to calculate the percentage of medical records in which guideline-based care was documented (performance rate).

Return to work

Descriptive analyses were used to calculate the mean and median time to first and full return to work.

Guideline adherence and time to return to work

Cox regression analysis was used to assess the impact of guideline adherence (overall and per item) on (time to) first and full return to work. To correct for the clustered design, the frailty random effect was used in this analysis [29,30]. Workers were censored when first or full return to work was not established within the follow-up period, or when the sickness absence period ended before their return to work was established. It is likely that these workers resigned or that the employer contracted another occupational health service, but it was not possible to retrieve this information from the registration system of the occupational health service.

The potential confounders were added one by one to the base model to test if they influenced the regression coefficient by more than 10%, or, in case the base model was non-significant, they changed the significance of the model. All variables that were shown to be confounders were included in the final model.

We merged data from the intervention and control groups of the larger study, which was adequate, provided that the intervention was not effective [31]. Although the intervention did not affect return to work [32] and did not substantially affect the degree of guideline adherence [Joosen et al., submitted], we could not rule out the possibility that the intervention might have had a modifying effect on the association between guideline adherence and return to work. Therefore, we tested the intervention for effect modification in all analyses. If the intervention proved to be a significant effect modifier, we reported results for the intervention and control groups separately. Otherwise, results were reported for the merged groups.

Analyses were performed with SPSS version 19.0 and R statistical program version 3.1.2. with the frailtypack [29].

Results

Baseline characteristics

Table 4 shows the baseline characteristics of the 114 workers. The average age of the workers was 46 years (SD 10.7), the majority were female. The average age of the occupational

Table 2. Description of 12 performance indicators for occupational physicians' guideline adherence in workers' medical records and criteria for their scoring [Joosen et al., submitted].

Performance Indicator	Criteria	Scoring*
1. Process diagnosis		
1.1 Monitoring the recovery phase of the worker	The process of recovery (i.e. phase of the recovery process: crisis phase, problem solving phase, implementation phase) should be monitored throughout the sickness absence period	0 = Recovery phase not documented 1 = Recovery phase occasionally documented 2 = Recovery phase regularly documented
1.2 Assessment of the worker's recovery tasks	The tasks needed to achieve recovery should be assessed throughout the sickness absence period (e.g. gaining insight into what happened, accepting the situation, regain day structure, problem identification and finding solutions, implement solutions, regain roles)	0 = Recovery tasks not documented 1 = Recovery tasks occasionally documented 2 = Recovery tasks regularly documented
1.3 Assessment of the employers' perspective	The way the employer (e.g. supervisor, management, human resource management) copes with the sick-listed worker and their perspective on recovery should be assessed during the sickness absence period	0 = No information about the employers' perspective 1 = Occasional information about the employers' perspective 2 = Clear description of the employers' perspective in relation to the worker's situation
2. Problem orientation		
2.1 Problem identification	The relation between factors that influence the mental health problems and performance at work and home should be identified (e.g. overburdened by high workload or work conflict or lack of social support)	0 = Problems not documented 1 = Problems documented, relation with performance not documented 2 = Problems and their relation with performance documented
2.2 Assessment of symptoms	Presence or absence of essential symptoms of mental health problems should be assessed (i.e. distress, depression, anxiety, and somatization)	0 = No symptoms documented 1 = Symptoms occasionally documented 2 = Presence or absence of the essential symptoms documented
2.3 Diagnosis	Diagnosis based on ICD-10 and supported with arguments	0 = No diagnosis documented 1 = Diagnosis documented without arguments 2 = Diagnosis documented, including arguments
3. Intervention/Treatment		
3.1 Evaluation of the worker's course of the recovery process	The course of the recovery process (stagnation or recovery process as expected) should be evaluated and supported with arguments.	0 = Course of recovery process not documented 1 = Course of recovery process documented without arguments 2 = Course of recovery process documented including arguments
3.2 Treatment in accordance with the worker's recovery process	IF recovery process is 'as expected', the occupational physician acts as process manager by monitoring the process of recovery and using minimal interventions. IF recovery process stagnates, the occupational physician also acts as care manager by providing a more extensive guidance with treatment based on cognitive behavioral techniques, providing the employer with advice on recovery and the return to work process, contacting other health care professionals (e.g. general practitioner, psychologist), and if necessary referring the worker to specialized care.	0 = Treatment is not in accordance with the recovery process 1 = Treatment is in accordance with the recovery process without argumentation 2 = Treatment is in accordance with the recovery process including argumentation
4. Relapse prevention		
4.1 Relapse prevention	Relapse prevention should be integrated during consultations AND the occupational physician has at least one consultation with the worker after full return to work	0 = No information on relapse prevention documented 1 = Information on relapse prevention during or after the sickness absence period documented 2 = Information on relapse prevention during the sickness absence period documented AND the occupational physician had at least one consultation with the worker after full return to work
5. Continuity of care/Evaluation		
5.1 Rapid first consultation	First face-to-face consultation within 15 days from the first day of sickness absence.	0 = First consultation after 22 days 1 = First consultation between 15–22 days 2 = First consultation with 15 days
5.2 Regular contact with the worker	Consultations with the worker take place every 3 weeks during the first three months of sickness absence. Thereafter consultations take place every 6 weeks.	0 = Interval between consultations 6 weeks or more during first 3 months AND 9 weeks or more thereafter 1 = Interval between consultations 4–5 weeks during first 3 months AND 7–8 weeks thereafter 2 = Interval between consultations less than 4 weeks during first 3 months AND less than 7 weeks thereafter
5.3 Regular contact with the employer	Occupational physician contacts the employer (e.g. supervisor, manager, human resource manager) during the sickness absence period every 4 weeks.	0 = Contacts every 8 weeks or more 1 = Contacts every 5–8 weeks 2 = Contacts every 4 weeks or less

*Scoring: 0 = no adherence, 1 = minimal adherence, 2 = adequate adherence.

Table 3. Guideline adherence per performance indicator (percentages of workers, $n = 114$).

Performance Indicator	No adherence = score 0		Low adherence = score 1		Adequate adherence = score 2	
	IG $n = 55$	CG $n = 59$	IG $n = 55$	CG $n = 59$	IG $n = 55$	CG $n = 59$
Process diagnosis	%	%	%	%	%	%
1.1 Monitoring the recovery phase of the worker	41.8	71.2	47.3	28.8	10.9	0.0
1.2 Assessment of the worker's recovery tasks	29.1	61.0	65.5	39.0	5.5	0.0
1.3 Assessment of the employers' perspective	32.7	33.9	49.1	52.5	18.2	13.6
Problem orientation						
2.1 Problem identification	0.0	8.5	74.5	79.5	25.5	11.9
2.2 Assessment of symptoms	56.4	74.6	34.5	22.0	9.1	3.4
2.3 Diagnosis	10.9	20.3	78.2	76.3	10.9	3.4
Interventions/Treatment						
3.1 Evaluation of the worker's course of the recovery process	30.9	57.6	60.0	35.6	9.1	6.8
3.2 Treatment in accordance with the worker's recovery process	40.0	57.6	45.5	32.2	14.5	10.2
Relapse prevention						
4.1 Relapse prevention	72.7	86.4	25.5	11.9	1.8	1.7
Continuity of care/Evaluation						
5.1 Rapid first consultation	34.5	28.8	12.7	18.6	52.7	52.5
5.2 Regular contact with the worker	36.4	35.6	36.4	39.0	27.3	25.4
5.3 Regular contact with the employer	78.2	79.7	9.1	8.5	12.7	11.9

IG: intervention group ($n = 55$);
CG: control group ($n = 59$).

Table 4. Baseline characteristics of the workers.

Characteristic	n	Mean	SD	%	% workers above cutoff value
Age	114	46.4	10.7	.	.
Gender, male	114	.	.	41.2	.
Return to work self-efficacy (range 1–6) ^a	107	3.5	0.8	.	.
Workability (range 0–10) ^a	103	5.4	2.5	.	.
4-DSQ (Four-Dimensional Symptom Questionnaire)					
Distress (range 0–32, cutoff >10) ^a	109	18.0	9.3	.	74.3
Depression (range 0–12, cutoff >2) ^a	111	2.8	3.7	.	39.6
Anxiety (range 0–24, cutoff >3) ^a	109	5.4	5.2	.	50.5
Somatization (range 0–32, cutoff >10) ^a	107	9.3	6.6	.	35.5

^aHigher scores indicate a greater presence of the named factor.

physicians was 54 years, and the majority were male (77%). Distress was the most prevalent mental health problem (74.3% of the workers scoring above the cutoff for moderate distress).

Guideline adherence

Overall guideline adherence

The actual degree of overall guideline adherence was low, since the median score of the sum score of all PIs was 8 (range 0–18) on a scale of 0–24 (results not shown).

Adherence to specific guideline items

The adherence to specific items per PI is shown in Table 3. Concerning the mean percentages of 'adequate guideline adherence' of both groups, there were only two PIs with more than 20% 'adequate guideline adherence': 'Rapid first consultation worker' (52.6%), and 'Regular contact worker' (26.3%).

Return to work

After one year, 84% of the 114 workers established a first return to work, whereas 79% of the 114 workers established full return to work. The mean time to first return to work was 159 calendar days (SD 124) and the median time was 117 calendar days (range 0–365). The mean time to full return to work was 220 calendar days (SD 112) and the median time was 204 calendar days (range 27–365).

Guideline adherence and time to return to work

Is better guideline adherence by occupational physicians associated with earlier return to work in workers?

Overall guideline adherence (PI sum score ≥ 8 versus < 8) was not associated with earlier first return to work (Hazard Ratio 1.07 (95%CI 0.52 – 1.21), $p = 0.747$) nor with earlier full return to work (Hazard Ratio 1.25 (95%CI 0.82 – 1.89), $p = 0.301$).

Which specific guideline items are associated with earlier return to work?

The results are presented in Table 5 (first return to work) and Table 6 (full return to work). A Hazard Ratio greater than 1 indicated earlier return to work; a Hazard Ratio less than 1 indicated delayed return to work. Group allocation turned out to be an effect modifier of 2 associations. The 'Assessment of the employer's perspective' was associated with significantly delayed return to work in the control group, but not in the intervention group. The 'Evaluation of the course of the recovery process' tended to be associated with delayed return to work in the control group whereas it tended to be associated with earlier return to work in the intervention group. The difference between the groups was statistically significant but within the separate groups the effects were not significant. In several analyses, confounders had to be taken into account.

In almost none of the PIs, was guideline adherence associated with return to work (see Tables 5 and 6). Regular contact between the occupational physician and the employer (PI 5.3) was

Table 5. Effect of guideline adherence per performance indicator on time to first return to work, adjusted for significant confounders ($n = 114$).

Performance Indicator	HR	95% CI	<i>p</i> value	Confounder
Process diagnosis				
1.1 Monitoring the recovery phase of the worker	0.68	0.44–1.06	0.088	Anxiety
1.2 Assessment of the worker's recovery tasks	0.79	0.52–1.21	0.279	
1.3 Assessment of the employers' perspective	0.59	0.36–0.96	0.033*	Gender, anxiety, RTW-SE
Problem orientation				
2.1 Problem identification	0.92	0.34–2.50	0.877	
2.2 Assessment of symptoms	0.71	0.45–1.14	0.162	
2.3 Diagnosis	0.75	0.43–1.30	0.302	
Intervention/Treatment				
3.1 Evaluation of the worker's course of the recovery process	0.81	0.53–1.23	0.320	
3.2 Treatment in accordance with the worker's recovery process	1.05	0.69–1.59	0.829	
Relapse prevention				
4.1 Relapse prevention	1.47	0.87–2.48	0.150	
Continuity of care/Evaluation				
5.1 Rapid first consultation	1.32	0.84–2.09	0.231	
5.2 Regular contact with the worker	1.26	0.81–1.98	0.304	
5.3 Regular contact with the employer	1.36	0.82–2.26	0.228	

RTW-SE: return to work self-efficacy;

HR: hazard ratio 95% CI: 95% confidence interval;

*Significant $p < 0.05$.

significantly associated with earlier full return to work but not with first return to work. Regular contact between the occupational physician and the worker showed a similar pattern although the association was not statistically significant. Unexpectedly, 'Monitoring the recovery phase of the worker' was significantly associated with delayed full return to work and almost significantly with first return to work. Similarly, 'Assessment of the employers' perspective' was significantly associated with delayed first and full return to work, but the latter only in the control group.

Discussion

The findings of our study indicate that occupational physicians' documented guideline adherence was, at most, minimal. Because we observed so little *adequate* levels of guideline adherence, we could not evaluate the impact of adequate guideline adherence on the return to work of workers sick-listed with common mental disorders. Occupational physicians' low overall adherence to the guideline was associated with neither earlier first return to work nor earlier full return to work in sick-listed workers.

An important question that arises from the results of this study is: why did occupational physicians adhere so minimally to the guideline? We can only speculate about possible explanations. The low degree of guideline adherence adds to previous research showing low guideline adherence among health care professionals in general [33–35]. Although several implementation strategies have been developed and evaluated, it is still challenging to implement and improve professionals' guideline adherence [5,17,36–38]. Results from other studies have shown that barriers to the use of guidelines play a crucial role in professionals' degree of guideline adherence. According to the framework of Cabana and colleagues, specific barriers for guideline use are: knowledge-related, attitude-related, and related to external factors [33]. In a qualitative study, Lugtenberg and colleagues [39] found that occupational physicians reported considerable external barriers to using the Dutch occupational mental health guideline (e.g. lack of time, limited number of contacts between occupational physician and worker, and conflicting policy on, and lack of collaboration with, for example, employer and other health care providers). These external barriers were difficult to overcome, whereas several

other – internal – barriers related to knowledge and attitude (skills and motivation) could readily be removed. These findings underline what Cabana and colleagues [33] already pointed out, namely that external barriers can affect the ability of occupational physicians to execute the guideline recommendations. It seems likely that, in general, elimination of external barriers is conditional for better guideline adherence by professionals.

Despite the minimal adherence, regular contact between the occupational physician and the employer (and the worker) was associated with earlier return to work. As about 80% of the medical records showed no regular contact between the occupational physician and the employer, this suggests there is considerable room for improvement in the care of sick-listed workers. In the current study, it remains unclear whether the established contacts were mostly initiated by the occupational physician, the employer, or the worker, and whether more contacts between the occupational physician and the employer caused earlier return to work, or vice-versa. The importance of the involvement of the employer (e.g. supervisor, human resource management or managers) in the recovery and return to work process underlines the findings of other studies [40–43]. Apparently, if occupational physicians can invest time in contact with the worker and the employer or when employers themselves are inclined to contact their occupational physicians and their workers more often, this study found that this tended to be associated with earlier return to work, a finding which is in line with previous studies [12,43]. Regular contact between the employer and the occupational physician might contribute to the perceived social support of the worker. Moreover, the employer has a key role in the recovery and the return to work process as the employer is familiar with the characteristics of the work and has the ability to implement (temporary) work adjustments that might be necessary for earlier work resumption. In addition, research has indicated that work is beneficial for health, particularly for depression and general mental health [44].

The finding that the occupational physicians' monitoring of the recovery phase of the worker and assessment of the employers' perspective were associated with delayed return to work seems counter-intuitive. There are several possible explanations for these findings. First, perhaps occupational physicians who conducted a more thorough assessment of the 'Process diagnosis' found more complaints and problems and, as a result, may have allowed the

Table 6. Effect of guideline adherence per performance indicator on time to full return to work, adjusted for significant confounders ($n = 114$).

Performance indicator	HR	95% CI	p value	Confounder
Process diagnosis				
1.1 Monitoring the recovery phase of the worker	0.62	0.39–0.97	0.035*	Anxiety
1.2 Assessment of the worker's recovery tasks	0.92	0.60–1.38	0.667	
1.3 Intervention group: assessment of the employers' perspective	1.52	0.75–3.06	0.246	Anxiety, somatization, workability
Control group: assessment of the employers' perspective	0.37	0.18–0.77	0.008*	Anxiety, somatization, workability
Problem orientation				
2.1 Problem identification	0.68	0.26–1.24	0.439	
2.2 Assessment of symptoms	0.80	0.52–1.24	0.317	
2.3 Diagnosis	0.87	0.50–1.54	0.642	
Intervention/Treatment				
3.1 Intervention group: evaluation of the worker's course of the recovery process	1.72	0.68–4.38	0.254	Distress, anxiety, somatization, workability, RTW-SE
Control group: evaluation of the worker's course of the recovery process	0.63	0.29–1.39	0.254	Distress, anxiety, somatization, workability, RTW-SE
3.2 Treatment in accordance with the worker's recovery process	1.16	0.77–1.75	0.487	
Relapse prevention				
4.1 Relapse prevention	1.21	0.74–2.00	0.443	
Continuity of care/Evaluation				
5.1 Rapid first consultation	1.29	0.81–2.03	0.281	
5.2 Regular contact with the worker	1.66	0.98–2.81	0.058	Workability, RTW-SE
5.3 Regular contact with the employer	1.87	1.10–3.16	0.021*	Distress, depression, somatization, RTW-SE

RTW-SE: return to work self-efficacy; HR: hazard ratio 95% CI: 95% confidence interval;

*Significant $p < 0.05$.

worker to take more time for the recovery and return to work process. Alternatively, and equally plausibly, imminent delayed return to work may have urged the occupational physician to pay more attention to the worker's recovery process (phases) and the employer's perspective on the return to work of the worker. Further exploration is needed about how better assessment and more complex cases can be optimally incorporated in the guidance by occupational physicians.

However, contrary the expectation that the initial group allocation would have no influence on the associations, the association between delayed full return to work and the 'assessment of employers' perspective' was only seen in the initial control group and not in the intervention group. A possible explanation for this might be that the occupational physicians in the intervention group developed more skills and a habit of assessing the employers' perspective regardless of how the recovery and return to work process progressed, whereby they had the ability to intervene in time and to avoid delayed return to work of the worker.

Strengths and limitations

The present study has several strengths and limitations that need to be discussed. First, a strength is the conscientious and careful procedure used to develop the PIs. Another strength is the low risk for bias, as data were obtained from the registration system of the occupational health service. An audit of medical records is susceptible to bias. The risk for recording desired performance by the occupational physician is minimal, since the data collection started 3.5 years after the occupational physicians, and 1.5 years after the workers, had given informed consent. To prevent interpretation bias, all medical records were blindly assessed independently by two researchers and by a third researcher in cases where no consensus was reached.

A limitation of this study is that medical records do not necessarily reflect the actual behavior of the occupational physician, for example due to habit, lack of time, or an inadequate record system. However, the method of auditing medical records is also a strength; it is more accurate than self-perceived adherence [45]. Also, it does not interfere with actual performance, as for example, actual or video observation of consultations would have done, since occupational physicians were not aware of which records

were assessed. A second limitation is that no information was available from workers who did not participate in the study, for which reason a non-response analysis could not be conducted. Another limitation is that it was assumed in this study that all individual PIs influenced the degree of guideline adherence equally. However, some PIs might be conditional for others: notably if an occupational physician does not have regular contacts with the worker or the employer, it can hardly be expected that increased knowledge and skills will optimize the guidance. Furthermore, time to return to work may not be the best workers' outcome to evaluate, because time to return to work does not reflect the quality of workers functioning after work resumption. Similarly, we chose a Dutch social security definition of sustained return to work implying a minimum of four weeks of full return to work without relapse into sickness absence. This definition, however, provides little information on the quality of the work or the long-term sustainability. Measurement of the quality of workers' functioning provides additional and essential information besides time to return to work [46,47], which might be more important in more complex cases and in general.

Conclusion and implications

Because of the low percentage of *adequate* guideline adherence, it was not possible to evaluate the associations between *adequate* guideline adherence and the time to return to work in workers with common mental disorders. Overall guideline adherence was not associated with earlier return to work in workers with common mental disorders (first research question). However, when evaluating specific items of the guideline (second research question), regular contact between the occupational physician and the employer was found to be associated with earlier return to work in workers, even with minimal-to-adequate adherence. On the other hand, two specific parts of the guideline ('Monitoring the recovery phase of the worker' and 'Assessment of the employers' perspective') were associated with delayed return to work in workers. Future research should explore these associations further, and also explore the importance of individual PIs, as some may be more important than others for successful return to work. Furthermore, future research should focus on how implementation problems and conditional external barriers for guideline use can

be overcome, so as to improve the quality of guideline-based occupational mental health care. A suggestion would be that future implementation should also target the level of commitment of organizations to reducing organizational constraints to enable professionals to provide high-quality occupational health care. If future guideline implementation proves to be able to achieve truly adequate guideline adherence, instead of the current minimal adherence, new studies can assess the impact of adequate adherence on workers' return to work and functioning.

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Disclosure statement

JvdK was the manager and main author of the NVAB guideline. JvdK did not receive fees for the use of the guideline. JvdK, MJ, and EB developed the training for occupational physicians in this study. MJ was the trainer of the training for occupational physicians. The authors did not receive fees for conducting the training. KvB, BT, and JvW declare that they have no conflicts of interests.

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