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**Cooperation between general practitioners,  
occupational health physicians, and rehabilitation  
physicians in Germany: what are barriers to cooperation  
and how can these be overcome?**

**A qualitative study**

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# Widmung

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# 1 Abbreviations

DRV Deutsche Renten Versicherung

FGDs Focus Group Discussions

GPs General Practitioners

OP Occupational Health Physicians

RPs Rehabilitation Physicians

RTW Return to Work

## 2 Introduction

### 2.1 Overall concept of dissertation

This dissertation is conducted in the field of health services research. It focuses on barriers to and obstacles in the cooperation between general practitioners, occupational health physicians, and rehabilitation physicians in Germany, and explores approaches of how these barriers and obstacles can be overcome. The dissertation consists of three publications, which were published in international peer-reviewed scientific journals as part of a larger research project conducted by and under the supervision of Prof. Dr. Völter-Mahlknecht.

The foundation for the overall research project was a literature review of the international and German scientific literature on interface between rehabilitation and occupational health physicians [1]. The authors Völter-Mahlknecht and Rieger found that: “In practice, the reintegration [of patients to the workplace after rehabilitation therapy] is achieving unsatisfactory results” and that reasons for the unsatisfying reintegration quotas include – among other things – “current temporary latencies and qualitative deficits of rehabilitation discharge reports, unsatisfying communication and cooperation between rehabilitation and company doctors, insufficient presence of company doctors, and trust issues between rehabilitant and company doctor”[1]. The authors furthermore concluded that “since the currently available data are dissatisfactory concerning the medical interfaces in the rehabilitation process, despite the high thematically relevance, research activities should absolutely be intensified in this field of interest.”[1]. As this review as well as another non-systematic literature review on a similar topic [2] indicated a knowledge gap regarding the interface between rehabilitation and occupational health physicians, the literature review was followed by a qualitative research project. This approach is in accordance with the Medical Research Council (MRC) recommendations for the design and evaluation of complex interventions to improve health [3]. This qualitative research phase within the overall research project constitutes the basis for this cumulative dissertation.

The first publication (Experiences, attitudes and possibilities for improvement concerning the cooperation between occupational physicians, rehabilitation physicians and general practitioners in Germany from the perspectives of the

medical groups and rehabilitation patients – a protocol for a qualitative study)[4] is the published version of the study protocol and describes the qualitative research phase within the larger research project. It was published in the journal BMJ Open. This publication provides an in-depth description of the theoretical background, research questions and methodology to be applied as well as a framework of how the cooperation between the stakeholders is conceptualized.

The following two publications in this dissertation project [5, 6] were published in the journal International Archives of Occupational and Environmental Health and present the main results of the qualitative research phase: Hereby the publication Optimizing cooperation between general practitioners, occupational health and rehabilitation physicians in Germany: a qualitative study [6] focuses on the barriers to and obstacles in the cooperation and communication between the involved professional groups as experienced by the participants of the Focus Group Discussions. The publication Optimizing cooperation between general practitioners, occupational health and rehabilitation physicians in Germany: a qualitative study [5] focuses on approaches of how communication and cooperation between the protagonists may be improved.

Preliminary results of the qualitative study phase were presented at conferences multiple times and in 2015 the author Jan M Stratil received the poster award for junior researchers by the Deutsche Gesellschaft für Arbeits- und Umweltmedizin.

A fourth manuscript by the author which also builds on the qualitative study phase I not part of the dissertation. This study conceptualizes the perceived cooperation deficits between the protagonists on the theoretical background of the Social Identity Approach by Tajfel and Turner [7]. The manuscript was submitted to the journal BMC Health Services Research at the moment and is in the peer-review at the moment (Stratil et al, in peer review).

One aim of the larger research project was the development of a questionnaire to allow for and facilitate future quantitative research. The development of the questionnaire was intended to follow and build on the results of this qualitative research phase and inter alia to assess the relative weight of the findings. The development of the questionnaire as well as a subsequent quantitative research phase is not part of this dissertation project. Although a questionnaire for general practitioners based on the results of the qualitative study phase was developed

by the author and pilot-tested in a convenience sample of resident doctors. The results were presented at a conference of the Deutsche Gesellschaft für Arbeits- und Umweltmedizin in Munich in 2016 [8].

## **2.2 Introduction to the research project**

This segment on the background of the research project is based on the introduction sections of the published manuscripts written by the author [4, 5]. Also, a brief overview over the methodology is given. The specifics of the methodological approach are outlined in the published study protocol [4] and the methods section of the two publications on the results [5, 6].

### **2.2.1 Rehabilitation in Germany**

The number of rehabilitative treatments conducted in Germany has increased steadily in the past decades [9, 10]. For example has the number of completed services in the context of medical rehabilitation provided by the German Pension Fund (Deutsche Rentenversicherung, DRV) increased by 24 percent between the year to 2000 and 2015 (from 1017 therapies per 100.000 inhabitants in 2000 to 1258 therapies per 100.000 2015) [9]. The number of provided services for participation in the working life (Leistungen zur Teilhabe am Arbeitsleben) have increased from 105 provided services per 100.000 inhabitants in 2000 to 187 services provided per 100.000 in the year 2015. An increase by more than 78 percent [10]. This development was driven – among other things – by an overall aging demographic structure, the changing disease spectrum including the epidemiologic transition and an increase in non-communicable chronic diseases, as well as changes in the workforce and its age structure [10].

Not only is rehabilitation an essential element for an independent and self-determined existence, but also aims at retaining older parts of the population within the workforce and helps patients after disease or injury to again take part in the working life. Beyond the economic benefits for the employer and society as a whole, the ability to work is a key component of self-identity for substantial parts of the population. Therefore rehabilitative interventions aim to provide rapid and sustainable return to work (RTW) of the patient through linking prevention, treatment and post-treatment care within rehabilitative interventions [10-12].

As the rehabilitative health care system in Germany is complex, the next segments aim to give a brief and focused overview over key components of the



German rehabilitation process, which are important for the understanding of this study.

The German code of social law (Sozialgesetzbuch) distinguishes between three main forms of rehabilitation: medical, occupational, and social rehabilitation. A patient is eligible for medical rehabilitation if his or her earning capacity is diminished or substantially at risk to be diminished in the near future. In such a case, the funding agency (the payer of the rehabilitative treatment) will be the German Pension Fund (Deutsche Rentenversicherung, DRV) [13, 14]. Medical rehabilitation inter alia includes the treatment by specialized physicians, stress tests and other diagnostics, psychological or/and physical therapy, and occupation-focused rehabilitation therapy (medizinisch-beruflich orientierte Rehabilitation, MBOR) as well as the provision of assisting devices to support the patient at the work place and graded (occupational) reintegration programs (§ 15 SGB VI, §§ 26–31 SGB).

### **2.2.2 Intersections in the rehabilitative health care system in Germany**

Intersections (in German: “Schnittstellen”) are points of transition in complex social systems. At these intersections specific professional expertise and skill levels, organizational responsibilities as well as the reach provided services end, which creates the need of continuation and supplementation in a cooperative manner. While an increasing specialization and professional focus allows for an increase in quality and a refinement of the performance of individual providers, the intersections which emerge as a result may interfere and disrupt the efficient delivery of health care services [15-17]. In the broader healthcare system, these intersections, their characterization and optimization, are key interests in health services research [18, 19].

Within the highly segmented rehabilitative healthcare system in Germany multiple specialized protagonists and institutions fulfil different functions and roles, which create several of such intersections between institutions and professional groups [9, 20]. The complexity of the web of intersections and interplay of institutions and protagonists is furthermore increased through the German sectoral health service system, complex goals as well as partly diverging goals and priorities of the protagonists and incentives provided to them [1, 21]. An additional layer of complexity is added, as the protagonists involved in

the rehabilitation process are not always familiar with the specifics of every sector of the healthcare system as well as by protagonists outside the health care system (e.g. employers and family), who also play an important role [21].

On the background of the current and further increasing relevancy of rehabilitation in Germany the importance of well-functioning intersections in the rehabilitation system are furthermore underlined [9, 20, 22, 23].

#### **2.2.2.1 Roles and functions of the main medical protagonists**

While various protagonists including multiple professional groups are involved in the German rehabilitation system, the main medical protagonists are general practitioners (GPs), occupational health physicians (OPs), and rehabilitation physicians (RPs) [1, 22]. Each of these three professional groups are meant to fulfil a specific function in the overall rehabilitation process, and therefore dependent on collaboration with and information flow from other protagonists in order to achieve improved health, social, and occupational outcomes for the patients. Barriers and obstacles to communication and cooperation between the protagonists may therefore lead to patients not receiving the best treatment possible and an improvement of the information flow may improve the professions' ability to function [4].

Within the rehabilitation system in Germany, GPs inter alia screen for and inform eligible patients about rehabilitation therapy, initiate and support the application process of the patients, provide preliminary medical information to the RPs before and during rehabilitation treatment, prepare the patients for the rehabilitative treatment and are responsible for the post-rehabilitation follow-up. This post-rehabilitation follow-up inter alia includes prescribing treatments and medication, issuing medical sickness certificates and evaluating the short and long term results of the rehabilitation treatment [4].

The RPs' main responsibility in the rehabilitation process is the rehabilitation treatment itself, as well as for the assessment of the patients' need for assisting devices and ability to work [4].

The OPs' functions in the overall rehabilitation process include inter alia screening for eligible employees among the workforce, initiating or supporting the application process, providing information about the patients' workplaces to RPs as well as assessing, preparing and discussing the occupational

reintegration. Furthermore, OPs can organize and manage the provision of individualized work accommodations (e.g. assisting devices), determine the need and possibilities for occupational retraining and job rotation as well as may play a role in evaluating the rehabilitation treatment [22, 24, 25].

#### **2.2.2.2 Key intersections between the main medical protagonists**

A rehabilitation therapy is initiated by patients by filing an application. It is common that the patient is supported by a medical specialist as the application for rehabilitation therapy needs to include a health assessment report by a GP, an OP, or another medical specialist [13, 14]. The funding agencies – in most cases the DRV – assess and decide on the patients' applications. If the application is rejected, an objection can be filed. The health information contained in the application is provided to the RP responsible for the patient. Additional information or data may be provided by GPs or OPs with or without a request from the rehabilitation clinic.

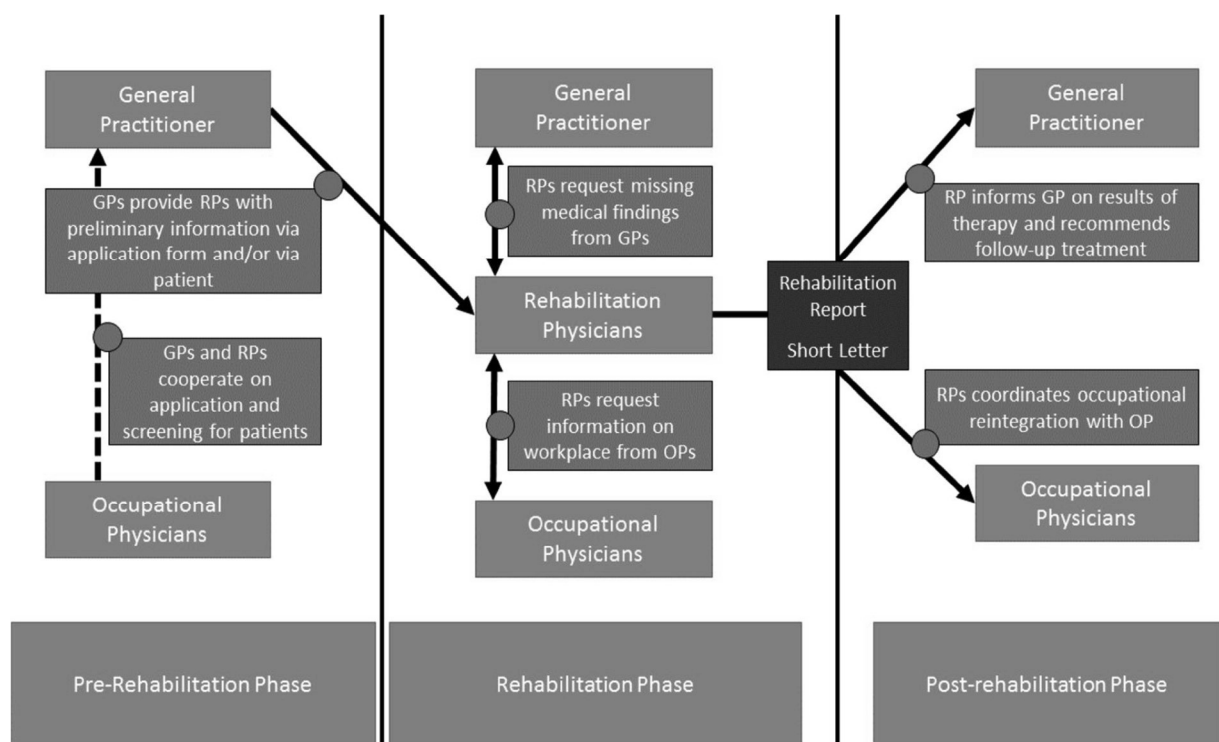
At the end of rehabilitation therapy, the rehabilitation institution assesses the need of (graded) occupational reintegration. When considered necessary, a proposed plan for (graded) occupational reintegration needs to be approved by the rehabilitant, the treating physician, and the employer. After rehabilitation, the physicians treating the patients (e.g., GP) are informed by the RP via a rehabilitation report and/or a short physician's letter. In the post-rehabilitation phase, GPs plan and organize the follow-up treatment and are involved in occupational reintegration of the patients [13] " [6]. As the OPs' role – inter alia – includes assessing, preparing, and discussing options for the patients' occupational reintegration, they are dependent on information provided by RPs and GPs [24, 26].

The intersection between the medical protagonists regarding the planning and implementation of the therapeutic strategy of graded RTW is of special importance. In this therapeutic strategy, the RP develops a therapeutic scheme in which the rehabilitation patient starts to work with reduced working hours per working day. The amount of working time is based on the patient's condition and is gradually increased until the employee is capable for an unrestricted RTW. As this therapeutic strategy is dependent on the consent of the employer, the employee, the funding agency (in most cases the DRV) and the treating physician, graded RTW constitutes an important intersection with the opportunity

to interlink efforts of rehabilitative services and occupational healthcare. Studies indicated that this intervention is as successful as a work rehabilitation strategy (e.g. in regard to time to RTW) [4, 11, 12, 27-32].

In order to improve the intersection between work and rehabilitation, the German federal state Baden-Württemberg German Pension Fund Baden-Württemberg (Deutschen Rentenversicherung Baden-Württemberg) in cooperation with the German society of occupation and company physicians (Verband der Deutschen Werks- und Betriebsärzte) have initiated the program BÄR BetriebsÄrztliche Rehabilitation, in which OPs may initiate and support the introduction of rehabilitation measures of employees through the local statutory pension insurance. Owing to the existence of the program BÄR, the federal state of Baden-Württemberg seems to be especially suitable to study the intersections within the medical and occupational rehabilitation process [25].

These intersections between the protagonists regarded by the author as most important for this study are also displayed in figure 1.



**Fig. 1** This figure displays the interfaces in the different stages of rehabilitation process between OPs, RPs, and GPs as reported by the participants in this study [6]. The figure is derived from figure 1 in Stratil 2017a [6].

### 2.2.3 Why improving the communication and cooperation between the medical protagonists?

The need to improve cooperation and communication between the medical protagonists and the need for well-functioning cooperation in rehabilitation systems in general was stressed by various experts in the field. Several studies, editorials and statements have been published by OPs, GPs and RPs in which it is agreed that an efficient cooperation at the intersections in the rehabilitation process is necessary for successful medical rehabilitation and RTW. Therefore, these protagonists emphasize the need to strengthen cooperation and communication between the medical protagonists [33-40].

An indirect argument why an improved cooperation and especially the inclusion of occupational health physicians should be aimed at comes from the international literature on occupation focused rehabilitation. Systematic and non-systematic reviews of the international literature (including several Cochrane Reviews) have revealed factors and interventions which have had a positive influence on the occupational health of patients in the respective settings (e.g. in regard to a reduction in the duration of sick leave and time to first RTW). Based on these reviews it can be concluded that there is a moderate-to-strong evidence of effectiveness for interventions like: individualized rehabilitation therapy adjusted for the specific demands of a given workplace, providing work accommodations (e.g. ergonomic improvements or assisting devices), and early contact of the worker with the workplace and improved insights of the healthcare provider with the patients' workplace [31, 32, 41-45]. Other systematic reviews found that multidisciplinary RTW strategies as part of the rehabilitation treatment to be successful regarding several occupational health outcomes [31, 46-48].

While these interventions were delivered in different ways and by different providers in the various health care systems, most of these aspects lie in the German rehabilitation system within the responsibility of OPs or depend on information provided by them. But in regards to these findings it needs to be acknowledged that due to the complexity of the health care systems, a generalizability or transferability of these findings to the German context may be hampered.

In a German setting, several studies have assessed the effect of improving the communication between OPs, GPs and RPs or the effects of improving the

integration of OPs in the rehabilitation process through different measures [27-30, 49-56].

This includes a non-randomized controlled trial which assessed the long term effect of an improved cooperation between a rehabilitation clinic and the company physician in a large car producing company. It found a reduction in the number of employees diagnosed as incapacitated for work after completing a rehabilitation therapy (10 % (26/254) in the intervention group vs. 17% (36/210) in the control group) [54].

Another example is an uncontrolled before-and-after study which used an optimized discharge letter to improve the information flow from the rehabilitation clinics to the patients' OPs. The authors conclude that the improved communication was supportive for both rehabilitation and occupational physicians and that it had a positive impact on reintegration and return to work [49, 50].

Bethge et al assessed the effectiveness of graded return-to-work (GRTW) in Germany and thereby an intervention which includes a cooperation between OPs and RPs [27, 28]. The researchers compared patients receiving GRTW with a synthetic propensity-score-matched control group and found the probability of a disability pension to be decreased by about 40% among GRTW patients (5.4% in the intervention group versus 8.6% in the control group; hazard rate ratio 0.62 (0.49-0.80)) [28].<sup>^</sup>

All of these studies and several other publications reports on positive effects of cooperation and communication or on interventions to improve it in a German setting. But at the same time, all of these publications face high threats to their internal validity and/or the study design does not allow definite conclusions.

To conclude: while facing some issues regarding external and internal validity, the national and international literature indicates that a well-functioning cooperation between GPs, OPs and RPs in the German health care system and especially the inclusion of OPs is an important prerequisite for a successful rehabilitation with focus on occupational health outcomes.

#### **2.2.4 What is the state of the intersections in the rehabilitation process?**

But despite these results, studies continue to depict a structural exclusion of OPs from the rehabilitation process [1, 2, 57]. Low levels and a low intensity of cooperation and communication between OPs and RPs were reported in surveys

involving RPs [2, 52, 58, 59], OPs [2, 52, 59-61], and rehabilitation patients [62] conducted in Austria [2], Belgium [2], Germany [52, 60-62], and the Netherlands [58, 59]. Similar findings for the cooperation between GPs and OPs were reported in publications from Germany, although these did not have an explicit focus on rehabilitation [63-65]. To give an example, in a Dutch survey, 22 % (n=29 of 129) RPs stated that they had a point of contact with an OP once or twice per month and 19 % (n=25 of 129) stated they communicated with a OP less than once per month [58].

A structural exclusion of OPs from the rehabilitation process is particular noticeable in the studies conducted in Germany [52, 60-62]. For example, in a cross-sectional study which surveyed OPs in Germany (n=293), 93% reported that cooperation with rehabilitation clinics seldom took place. 84% of participants negated that they received the rehabilitation report of employees who underwent rehabilitation therapy [60, 61]. Other studies underlined the survey findings, for example, by stating that systematic exchange of information between RPs and OPs does not take place on a regular basis [49] or that OPs would in many cases receive information on their patients' rehabilitation therapy months after their return – if at all [50].

### **2.2.5 Rationale of the study and methodological approach**

On the background of the contrast between the potential benefits of a well-functioning and/or improved cooperation on one side and the low levels and low intensity of cooperation with OPs in the rehabilitation process on the other side, this qualitative study intends to help better understand this discrepancy.

Owing to the scarcity in studies on causes for the low levels of cooperation [1, 2, 57], a qualitative approach was chosen, with the aim of gaining particularly detailed insights into the research field [66]. Qualitative research is an established methodological approach in the field of health services research [67-71] and Since the turn of the century, health services research focusing on issues of occupational health gained momentum in the research community [18, 72]. Qualitative research methods have repeatedly been used successfully to approach research questions related to the complex interplay between health and occupation [73-78].

Within the qualitative approach chosen for the studies of this dissertation project, the experiences and attitudes of the respective groups are surveyed in Focus Group Discussions [79]. Focus Group Discussions (FGDs) are established methods for data collection in health services research [80, 81].

Through thoroughly planned FGDs – which are moderated by an experienced researcher and supported by questions guiding the discussion [82] – perspectives, attitudes and experiences of OPs, RPs, GPs and rehabilitation patients on the topic of interest can be determined and thereby new insights gained [79]. FGDs were chosen over individual expert interviews, as these offer some distinct advantages, for example, that statements of individuals can be explored more thoroughly and developed further through in-group processes adding to or challenging what was said or that group dynamics may generate a new thinking about a topic [83-85].

Since one aim of the study was to identify possibilities for improvement and identify barriers of which the participants may not always be explicitly aware in their everyday routine, these features of FGDs were perceived as useful.

For the data analysis of the transcribed discussions I used a qualitative content analysis approach as described by Mayring [86]. The evaluation was conducted both deductive and inductive: deductive based on general prior knowledge acquired through the review of literature and the guiding questions; and inductive out of the material itself. Within this analytic approach I followed the standards for good scientific practice in qualitative research [87, 88] and used the COREQ reporting guide developed by Tong et al in the publications [89].

### **2.3 Research questions**

The approach of this qualitative study was to interview both the main medical protagonists (OPs, RPs, GPs) and rehabilitation patients to explore perceived reasons for barriers in the cooperation process and opportunities for improvement of the workplace-rehabilitation interface. The underlying aim of this study was to identify the potential for improvements in the communication and cooperation between OPs and RPs as well as between OPs and GPs.

As laid out in the published study protocol [4] and based on the communication framework laid out in the same document (Figure 1 in Voelter-Mahlknecht 2017 [4]), the research questions of this qualitative phase of the larger project were:



## **1. Collaboration and communication:**

- 1.1 “How do the medical parties (OPs, GPs, and RPs) experience and evaluate their cooperation?”
- 1.2 How do the participants experience the information flow between the stakeholders?
- 1.3 How strong is the cooperation between OPs, RPs and GPs?
- 1.4 What experiences do rehabilitation patients have with the intersection between OPs, RPs and GPs?”[4]

## **2. Effects of communication and cooperation on patients’ outcomes:**

- 2.1 “How do the medical stakeholders perceive or expect the effect of lacking/improved communication and cooperation on rehabilitation outcomes?”
- 2.2 What do rehabilitants expect from the cooperation between OPs, RPs and GPs?”[4]

## **3. Barriers to communication and cooperation:**

- 3.1 “What kind of practical advice for the improvement of the intersections can be deduced from the subjective evaluations of the different stakeholders?”
- 3.2 What are the determinants of good cooperation, according to the participants?
- 3.3 Does the cooperation between protagonists work better when OPs initiate the rehabilitation therapy?
- 3.4 What opportunities for optimisation do the medical parties and the rehabilitation patients point out?”[4]
- 3.5 What kind of changes in communication and cooperation between the main medical stakeholders have the participants experienced in recent years?”[4]

## **3 Results**

### **3.1 Publication 1**

Voelter-Mahlknecht S, Stratil JM, Kaluscha R, Krischak G, Rieger MA: Experiences, attitudes and possibilities for improvement concerning the cooperation between occupational physicians, rehabilitation physicians and general practitioners in Germany from the perspectives of the medical groups and rehabilitation patients - a protocol for a qualitative study. *BMJ open* 2017, 7(4):e014228.

# BMJ Open Experiences, attitudes and possibilities for improvement concerning the cooperation between occupational physicians, rehabilitation physicians and general practitioners in Germany from the perspectives of the medical groups and rehabilitation patients – a protocol for a qualitative study

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## ABSTRACT

**Introduction:** Rehabilitation measures for patients in the working age primarily aim at maintaining employability, restoring fitness for work or timely return to work (RTW). To facilitate RTW after long sick leave in Germany, both rehabilitation physicians' knowledge about the patients' workplace and communication between the rehabilitation physician and the occupational physician need to be improved. This research will record the experiences and attitudes of occupational physicians, rehabilitation physicians and general practitioners, as well as of rehabilitation patients, to indicate barriers and possibilities for improvement concerning the intersection between workplace and rehabilitation institution. As a previous literature review has shown, insufficient data on the experiences and attitudes of the stakeholders are available. Therefore, an exploratory qualitative approach was chosen.

**Methods and analysis:** 8 focus group discussions will be conducted with occupational physicians, rehabilitation physicians, general practitioners and rehabilitation patients (2 focus groups with 6–8 interviewees per category). Qualitative content analysis will be used to evaluate the data, thus describing positive and negative experiences and attitudes, barriers and possibilities for improvement at the intersection of general and occupational medicine and rehabilitation with regard to the workplace. The data from the focus groups will be used to develop a standardised quantitative questionnaire for a survey of the medical groups and rehabilitation patients in a follow-up project.

**Ethics and dissemination:** The research will be undertaken with the approval of the Ethics Committee of the Medical Faculty and University Hospital of

## Strengths and limitations of this study

- A strength of this qualitative study is that we will include the perspectives of both the main medical stakeholders (rehabilitation physicians, general practitioners, occupational health physicians) and the rehabilitants.
- We will strive to attain a maximal structural heterogeneity of participants in the focus group discussions in order to reflect the diversity of ideas and perceptions within the study population.
- A limitation of qualitative studies in general is that the results are not statistically generalisable or representative of the population as a whole.
- A limitation of the study is that, owing to resource and time constraints, not all stakeholders who are directly or indirectly involved in rehabilitation (ie, relatives of patients, representatives of funding agencies) can be invited for additional focus group discussions.

Tuebingen. The study participants' consent will be documented in written form. The names of all study participants and all other confidential information data fall under medical confidentiality. The results will be published in a peer-reviewed medical journal independent of the nature of the results.

## BACKGROUND

In the past decades, a steady increase in rehabilitation treatments has been observed in Germany.<sup>1 2</sup> This increase is driven inter

alia by demographic evolution, social objectives to extend retirement age, the changing spectrum of disease, an increase in chronic diseases and a changing workforce. For most members of society, the ability to work is the foundation of a self-determined and responsible existence. Rehabilitation links prevention, therapy and post-treatment care and aims to provide rapid and sustainable return to work (RTW) of the patient.

The rehabilitative healthcare system in Germany is an example of a highly segmented structure in which multiple protagonists fulfil different roles.<sup>1</sup> The existing and still increasing relevancy of rehabilitation itself therefore underlines the importance of well-functioning intersections in the rehabilitation process as well.<sup>1-4</sup>

Intersections in complex social systems are points of transition where organisational responsibilities, specific occupational competencies and delivered services end and are in need of cooperative supplementation and continuation. In healthcare, these intersections can be characterised and potentially optimised by health services research.<sup>5-7</sup> Such intersections also exist in German rehabilitation processes, due to often complex goals, as well as the German sectoral health service system.<sup>8</sup> In this system, each sector acts according to its own goals and priorities. The rehabilitation process is thus rather challenging, since those involved are not always familiar with the specifics of every sector of the healthcare system. Furthermore, protagonists outside the healthcare system (eg, family and employers) also play an important role in the process.<sup>8</sup>

From a positivist stance, intersections are transition points between segments of care and thus constitute an opportunity for specialisation and performance refinement. Intersections can, however, also induce interference in the effective delivery of healthcare.

The main medical protagonists in the German rehabilitation system are general practitioners (GPs), rehabilitation physicians (RPs) and occupational health physicians (OPs).<sup>3</sup> Each professional group fulfils a specific function in the rehabilitation process, which depends on or may be improved through collaboration and information flow to achieve social, occupational and health outcomes for the patients. Barriers to communication and cooperation between the protagonists may therefore lead to patients not receiving the best treatment possible.<sup>9</sup>

Figure 1A describes the intersections in the rehabilitation process between patients and the groups of medical stakeholders involved in our study.

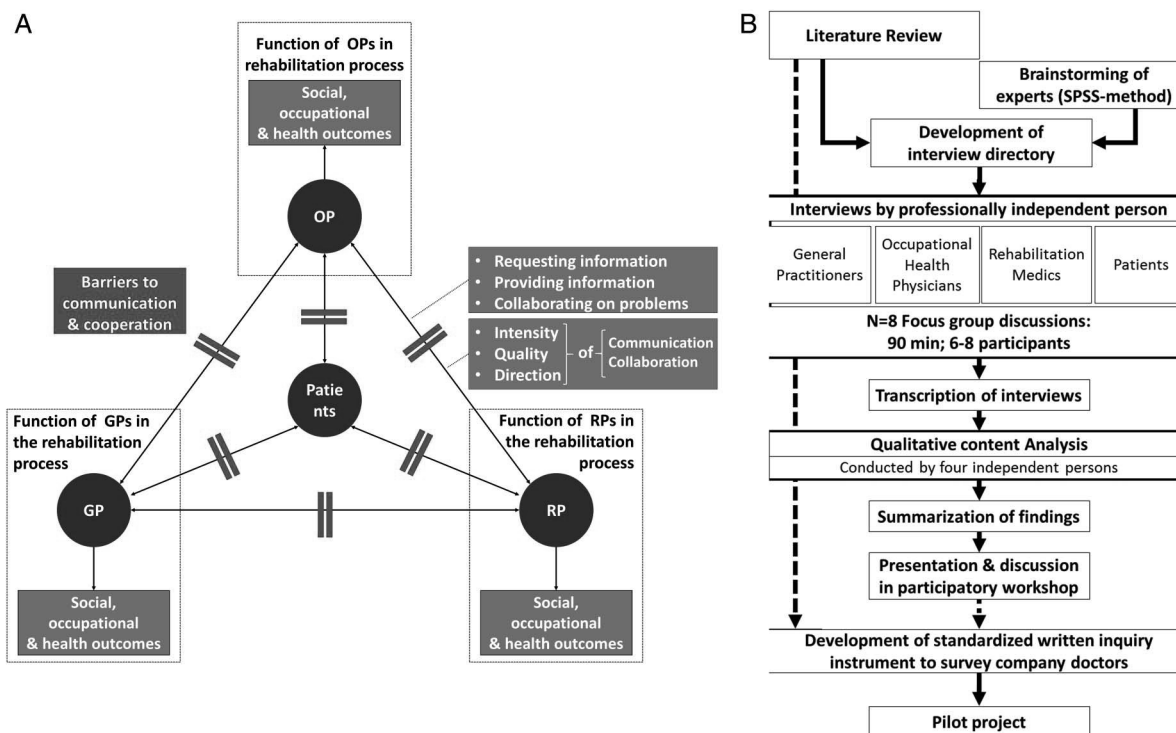
In the German rehabilitation system, GPs screen for patients, initiate and support the application process, provide preliminary medical information to the RPs, prepare the patients and are responsible for the postrehabilitation follow-up. The follow-up includes prescribing medication and treatments, issuing medical sickness certificates and evaluating the rehabilitation results. RPs are responsible for the rehabilitation treatment during the rehabilitation process, as well as for assessing the

patients' ability to work and need for assisting devices. OPs functions with regard to the rehabilitation process include screening among employees, initiating or supporting the application process, providing RPs with information about the workplace as well as assessing, preparing and discussing the occupational reintegration. OPs can manage the provision of work accommodation (eg, assisting devices), determine the need and possibilities for retraining and job rotation and play a role in the evaluation of the rehabilitation treatment.<sup>3 10 11</sup> To improve the intersection between work and rehabilitation, OPs in the German federal state Baden-Württemberg have the opportunity to support the introduction of rehabilitation measures through the local statutory pension insurance. Owing to this development, this federal state seems to be especially suitable to study the intersection of the medical rehabilitation process and the workplace.<sup>11</sup>

RPs, OPs and GPs complement each other with their specific abilities and institutional competences when it comes to reintegrating rehabilitation patients into the workforce. An intensive transfer of information between these medical groups concerning the entire rehabilitation process can help to approach the goals of the rehabilitation measures.<sup>8 12-14</sup> OPs, GPs and RPs agree that an efficient cooperation at the intersections is necessary for successful medical rehabilitation and RTW. Therefore, cooperation and communication need to be strengthened, according to these protagonists.<sup>15-23</sup>

One intersection between the protagonists is the therapeutic strategy of graded RTW. The RP develops a scheme in which the patient starts to work with reduced working hours a day, based on his or her condition, which gradually are increased until the employee is able for a full RTW. Since this strategy needs the consent of the employee, the employer, the funding agency and the treating physician, it constitutes an intersection with the opportunity to link efforts of occupational healthcare and rehabilitation services. Studies found this intervention to be successful as a work rehabilitation strategy (ie, in regard to time to RTW).<sup>8 24-28</sup>

International literature reviews have revealed factors which had a positive influence on the occupational health of patients (eg, in regard to reduced sick leave and time to first RTW). The authors of these studies conclude that there is a moderate-to-strong evidence basis for interventions like: individualised rehabilitation adjusted for the demands of a specific workplace, providing work accommodations, early contact of the worker with the workplace and contact of the healthcare provider with the patients' workplace.<sup>24 29-35</sup> In the German healthcare system, most of these aspects lie within the responsibility of OPs. Multidisciplinary RTW strategies as part of the rehabilitation treatment have been found to be successful in terms of occupational health outcomes.<sup>24 36-38</sup> For the setting of the German rehabilitation process, studies have indicated that improved cooperation in the rehabilitation process, and



**Figure 1** (A) Framework of cooperation between the stakeholders. Framework of cooperation, communication and information flow between the stakeholders involved in the qualitative study. The medical stakeholders (OPs, RPs and GPs) fulfil different functions in the rehabilitation system in order to achieve social, occupational or health outcomes. The professional groups interact in the process through collaboration and communication which can be characterised by its intensity, quality and the direction of interaction. The information flow and collaboration may be obstructed by barriers. (B) Flow chart of the study design. A literature search and the input of context experts were used to develop the interview guide used in the focus groups. A transcription of the focus group discussions will be used for quality content analysis and will be presented for content validation in a participatory workshop. GP, general practitioner; OP, occupational physician; RP, rehabilitation physician.

especially the inclusion of OPs, is beneficial in improving the occupational health of patients.<sup>14 25–27 33</sup>

Barriers for successful RTW often include RPs' insufficient understanding of the patients' workplace, as well as inadequate transfer of information between the RP and the occupational physician.<sup>8 9 14 23 39 40</sup> Furthermore, privacy regulations require the communication between RPs and OPs to be authorised by the patients. Sometimes they are reluctant to give the necessary permission.<sup>22 39–41</sup> So a deeper understanding of patients' attitudes towards OPs may be crucial to improve the RTW process.

However, although studies continue to show benefits of cooperating with OPs, other studies continue to draw the picture of a structural exclusion of OPs from the rehabilitation process. A low intensity of communication and cooperation between OPs and RPs has been shown in surveys from involving RPs,<sup>22 23 40 42</sup> OPs,<sup>23 40–42</sup> and rehabilitants<sup>43</sup> from Austria,<sup>23</sup> the Netherlands,<sup>22 40</sup> Belgium<sup>23</sup> and Germany.<sup>41–43</sup> Studies from Germany especially emphasised this structural exclusion of OPs from the rehabilitation process.<sup>41–43</sup> In a survey among German OPs (n=293), 93% reported that only seldom cooperation with rehabilitation clinics took place.<sup>41</sup> Other studies underlined the survey findings, for

example, by stating that systematic communication between RPs and OPs would not take place on a regular basis or that OPs often receive information on their patients' rehabilitation treatment months after the discharge, if at all.<sup>14</sup>

We conduct this study to better understand the discrepancy between the current structural exclusion of OPs from the rehabilitation process, and the possible benefits which improved cooperation with OPs would confer. The approach of this study is to survey both medical actors (OPs, RPs, GPs) and rehabilitation patients regarding their experiences, attitudes and perceived opportunities for improvement of the workplace–rehabilitation interface. The aim of this study is to determine the potential for improvement in the cooperation between OPs and RPs as well as between OPs and GPs. We also aim at determining the potential for a consequent improved RTW process overall.

## METHODS/DESIGN

On the basis of the Medical Research Council (MRC) recommendations,<sup>44</sup> we will conduct an exploratory qualitative approach to analyse the need for improvement descriptively. Within the scope of our methods, we

can identify what the stakeholders involved perceive as limiting and facilitating cooperation at the interfaces.

In a first phase of this project, a qualitative study using focus group discussions (FGDs) will be conducted and the derived data will be analysed using qualitative content analysis.<sup>45</sup> In a second phase (which is not part of this study protocol), a standardised quantitative survey for OPs, GPs, RPs and rehabilitants will be developed and tested before implementation in a third phase as a follow-up project.

### Research questions

Based on our framework of communication and cooperation between the protagonists involved in our study (figure 1A), the findings of the qualitative surveys of the groups noted above will be used to answer among others the following questions:

1. Collaboration and communication:
  - 1.1 How do the medical parties experience and evaluate their cooperation?
  - 1.2 How do the participants experience the information flow between the stakeholders?
  - 1.3 How strong is the cooperation between OPs, RPs and GPs?
  - 1.4 What experiences do rehabilitation patients have with the intersection between OPs, RPs and GPs?
2. Effects of communication and cooperation on patients' outcomes:
  - 2.1 How do the medical stakeholders perceive or expect the effect of lacking/improved communication and cooperation on rehabilitation outcomes?
  - 2.2 What do rehabilitants expect from the cooperation between OPs, RPs and GPs?
3. Barriers to communication and cooperation:
  - 3.1 What kind of practical advice for the improvement of the intersections can be deduced from the subjective evaluations of the different stakeholders?
  - 3.2 What are the determinants of good cooperation?
  - 3.3 Does the cooperation between protagonists work better when OPs initiate the rehabilitation therapy?
  - 3.4 What opportunities for optimisation do the medical parties and the rehabilitation patients point out?

Work-related medical rehabilitation has gained importance in the German rehabilitation process in recent years, while only a few primary studies on the cooperation of the protagonists have been conducted during the same period.<sup>9 39 46</sup> It is therefore possible that the cooperation and communication of protagonists have improved in recent years as well. Consequently, one research question will be:

What kind of changes in communication and cooperation between the main medical stakeholders have the participants experienced in recent years?

### Study design

Owing to the scarcity in data, the chosen method for the first study is a qualitative research approach with the aim of gaining particularly detailed insights.<sup>47</sup> Qualitative study designs are well established in health services research.<sup>48</sup> Since early 2000, health services research in the field of occupational health gained further interest among researchers<sup>7 49</sup> and qualitative methods have repeatedly been used successfully to answer research questions related to health and occupation.<sup>50–56</sup>

With the qualitative approach, the experiences of the respective groups are surveyed in FGDs.<sup>57</sup> FGDs are established methods in health services research.<sup>58 59</sup> Through thoroughly planned FGDs which are supported by guiding questions,<sup>60</sup> perspectives and experiences on the topic can be determined, and insights on the attitudes and perspectives of OPs, RPs, GPs and rehabilitation patients can be gained.<sup>57</sup> FGDs offer some advantages compared with individual interviews, for example, that ideas of individuals can be developed further through in-group processes or that group dynamics can generate new thinking about a topic.<sup>61–63</sup> Since we aim to identify possibilities for improvement, we perceive these features as useful. To ensure a free and uninterrupted discussion, the four groups involved in the rehabilitation process will be interviewed separately.

The questions for discussions will be developed on the basis of literature reviews<sup>9 39</sup> and brainstorming by an interdisciplinary team of scholars through a method that collects, tests, sorts and subsumes questions.<sup>64</sup> In a second round, these key questions will be reflected and revised by the research team. This team consists of two occupational medicine scholars (both with experience as OPs), one OP, a rehabilitation researcher and a health services researcher. The guiding questions will be adjusted to appropriately address the different groups of actors or the rehabilitation patients, respectively. The content of the discussions is meant to record questions concerning experiences with and attitudes towards the cooperation of OPs, GPs and RPs in regard to rehabilitation measures for patients in working age and opportunities to optimise them.

A professionally independent person (ie, neither an OP, nor a RP nor a GP) with experience in conducting interviews and familiar with the research topic will lead the four FGDs. The moderator is not going to have any prior established relationship with the patients. Participants will be informed about the moderator's profession, about the aim of the study and about the independency in relation to the research project. We will inform about the moderator's credentials, profession

and gender. The FGDs will be ~90 min long and will be audio taped in their entirety. A complimentary video will be produced to make it easier to assign voices to discussion participants during transcription.

The participants will be notified in writing during the recruitment process that the FGDs are going to be recorded, that these recordings will be transcribed using pseudonyms, and finally evaluated.

The transcribed data of the FGDs will be evaluated using qualitative content analysis.<sup>45</sup> This method involves four neutral persons to ensure an intersubjective correlation<sup>65</sup> (quality assurance through communicative validation). Prior to the analysis, all persons involved in the analysis will record their expectations, preliminary assumptions, and their own experiences in written form so as not to predetermine the analysis through prior understanding.<sup>64</sup> The resulting data will be evaluated using appropriate software (ie, MAXQDA).

The evaluation itself will be both inductive and deductive; inductive out of the material itself and deductive based on general prior knowledge and the guiding questions. First, the persons undertaking the analysis will read the transcript of one FGD separately and determine central themes. To ensure effective subjective understanding and to control for subjective blurring, the analysis will be validated by means of discussion between the two evaluators. The analysis of central themes will be performed sequentially in the first reading, for example, sentence by sentence, paragraph by paragraph. Repeated themes will be reflectively controlled in the ongoing analysis process, developed and finally brought together into categories. The content of the other focus group interviews will then be analysed using the previously developed category system, or the category system will be enhanced by new categories of content as they are encountered. The categories will be given definitions, coding rules and anchor examples to ensure proper assignment.<sup>45</sup>

In a final step, approaches to overcome or reduce the barriers and to improve the cooperation will be formulated, taking into account the experiences and wishes of the rehabilitation patients.

By means of a qualitative approach, the different groups of actors will be surveyed about optimisation possibilities. The insights gained through all actors will be collected to create practical initial suggestions. Towards the end of the project, these suggestions will be introduced and discussed in a participatory workshop used for content validation. Representatives of OPs, RPs and GPs will be invited to participate in this expert workshop.

The study design is displayed in figure 1B.

### Study population

To recruit the focus groups (n=6–8 interview partners), we will contact OPs from the address file of the Association of German factory and company doctors (Verband Deutscher Betriebs-und Werksärzte, VDBW).

RPs and rehabilitation patients will be recruited from two institutions (Therapy Center Federsee, Bad Buchau; Rehabilitation Center Bad Duerrheim, Klinik Huettenbuehl). GPs will be contacted from the training-practice lists of the former General Medicine Department of the Medical Faculty, University of Tuebingen.

The FGDs with GPs and OPs will take place at the University Hospital of Tuebingen in our institute in Tuebingen. The FGDs with RPs and rehabilitants will take place in the respective clinic and for RPs in the context of the regularly held meetings for continuing education.

### Election and invitation of the study population

For each group, participants as diverse as possible will be selected in accordance with the principle of maximal structural variation,<sup>66</sup> to represent the heterogeneity of the research field as accurately as possible. Table 1 shows the constituency of the four collectives.

### Election and invitation of GPs

For the group of GPs, primary care physicians, that is, office-based GPs and internists, supporting the work of the Department of General Medicine will be contacted. During the recruitment of the groups, equal representation must be ensured for both sexes, as well as both rural and urban geographic regions. Doctors from practices near to a larger occupational physician service (urban vs rural regions), as well as doctors from practices whose practice is not close to a large company and its particular occupational health service (urban vs rural regions) will be recruited. Furthermore, there will be a differentiation between doctors from individual and group practices. If several GPs will be available, the choice will be determined by the number of rehabilitation patients in care, the size of the practice (number of patients insured through statutory healthy insurance), as well as the years of experience as a GP. If feasible, GPs who also work as OPs will not be included. The invitation of the GPs will be conducted via email out of medical practices associated with the Department for General Medicine in the Medical Faculty of the University of Tuebingen. The GPs will be invited to participate in the FGDs, which will be conducted at the annual advanced training session for GPs at the University Department of Tuebingen.

### Election and invitation of OPs

For the group of OPs, we will recruit those who are specialised in company medicine or occupational medicine and who work primarily as OPs. During the creation of the groups, it must be ensured that both sexes and both rural and urban regions will be represented equally. Furthermore, it will be differentiated between (1) OPs working for one business and those working for several businesses; (2) OPs employed by an occupational service provider and those working independently; and (3) OPs with other duties of occupational medicine. If several

**Table 1** Planned composition of the four collectives for the focus group interviews**Two focus groups per category, participants per focus group: n=6–8**

General practitioners	<ul style="list-style-type: none"> <li>▶ n=4 doctors (male/female) in medical practice with a constituency from one occupational health service in the surroundings of a larger business               <ul style="list-style-type: none"> <li>– n=1 own medical practice in an urban region</li> <li>– n=1 own medical practice in an urban region</li> <li>– n=1 own medical practice in a rural region</li> <li>– n=1 shared medical practice in an urban region</li> <li>– n=1 shared medical practice in a rural region</li> </ul> </li> <li>▶ n=4 doctors (male/female) in medical practice without special ties to a business               <ul style="list-style-type: none"> <li>– n=1 own medical practice in an urban region</li> <li>– n=1 own medical practice in a rural region</li> <li>– n=1 shared medical practice in an urban region</li> <li>– n=1 shared medical practice in a rural region</li> </ul> </li> </ul>
OPs	<ul style="list-style-type: none"> <li>▶ n=1–2 OPs (male/female) employed by one company</li> <li>▶ n=1 OP (male/female) employed by an occupational service provider (serves one/a few businesses)</li> <li>▶ n=1 OP (male/female) employed by an occupational service provider (serves several businesses/small and medium-sized businesses)</li> <li>▶ n=1 OP (male/female) with additional function as a staff doctor (eg, organisations employing civil servants, eg, German Post (Deutsche Post), Federal Train Company (Deutsche Bahn), Police (Polizei))</li> <li>▶ n=1 OP (male/female) serving through own private practice (urban area)</li> <li>▶ n=1–2 OPs (male/female) serving through own private practice (rural area)</li> </ul>
RPs	<p>Rehabilitation centre 1</p> <ul style="list-style-type: none"> <li>▶ n=1–2 RPs (male/female)—internal medicine (internal medicine/oncology/rheumatology)</li> <li>▶ n=2–4 RPs (male/female)—orthopaedics</li> <li>▶ 1–2 RPs (male/female)—psychosomatics</li> </ul> <p>Rehabilitation centre 2</p> <ul style="list-style-type: none"> <li>▶ n=2–3 RPs (male/female)—general medicine/internal medicine</li> <li>▶ n=4–5 RPs (male/female)—specialists for psychosomatic medicine/psychiatrists</li> </ul>
Rehabilitation patients	<p>Rehabilitation centre 1:</p> <ul style="list-style-type: none"> <li>▶ n=4 rehabilitation patients from a small or medium-sized enterprise (=SME)               <ul style="list-style-type: none"> <li>– n=1 with an internal disease</li> <li>– n=2 with an musculoskeletal disorder</li> <li>– n=1 with a mental disorder</li> </ul> </li> <li>▶ n=4 rehabilitation patients from a large company               <ul style="list-style-type: none"> <li>– n=1 with an internal disease</li> <li>– n=2 with an musculoskeletal disorder</li> <li>– n=1 with a mental disorder</li> </ul> </li> </ul> <p>Rehabilitation centre 2:</p> <ul style="list-style-type: none"> <li>▶ n=4 rehabilitation patients from a small or medium-sized enterprise (=SME)               <ul style="list-style-type: none"> <li>– n=1–2 with an internal disease</li> <li>– n=2–3 with a psychosomatic disease or mental disorder</li> </ul> </li> <li>▶ n=4 rehabilitation patient from a large company               <ul style="list-style-type: none"> <li>– n=1–2 with an internal disease</li> <li>– n=2–3 with a psychosomatic disease or mental disorder</li> </ul> </li> </ul>

Small-sized and medium-sized enterprise based on the EU definition (Commission Recommendation of 6 May 2003 concerning the definition of micro-sized, small-sized and medium-sized enterprises (2003/361/EC)).  
EU, European Union; OP, occupational physician; RP, rehabilitation physician.

OPs are available, the choice will be determined by the years of experience as OP.

The OPs will be contacted via telephone. OPs will be informed about the aims of the study, the FGDs and privacy regulations. Unrelated to any actual participation in the study, structural data on the candidate will be recorded for the sampling. The persons not interested in partaking in the study will be asked for their consent to save and use the mostly structural data obtained during the telephone conversation for the study.

Election and invitation of RPs and rehabilitants

One focus group of RPs will be recruited from a medical rehabilitation centre that is specialised on internal, orthopaedic and psychosomatic diseases. The psychosomatic focus includes neurotic, stress-related, somatoform and affective disorders (including depression). Among the physicians specialised in orthopaedic rehabilitation, we will differentiate between the concept of occupational orthopaedic rehabilitation and psychosomatic orthopaedic rehabilitation.



For the other focus group with RPs, RPs will be recruited from a rehabilitation centre that is specialised on diseases in the musculoskeletal system and the respiratory system. For the choice of participating physicians, it will be ensured that the different medical indication groups (musculoskeletal disorders, mental disorders and internal diseases) of both clinics will be represented, that both sexes are represented equally and that doctors with as many different medical specialties as possible can be recruited. Furthermore, RPs with comparatively long professional experience in rehabilitation will be given preference. Using a short survey, a research assistant will conduct the first phone contact to record the characteristics used later for sampling.

We focused on the particular medical rehabilitation centres in order to include patients' suffering from, and physicians working on, disorders most relevant for in-house medical rehabilitation, which are: musculoskeletal disorders (reason of treatment in 34% of all female patients and 31% of all male patients), internal diseases (including oncological, cardiovascular, gastrointestinal, endocrine diseases; 25% among female patients, 30% among male patients), as well as mental disorders (21% among female patients, 13% among male patients).<sup>1</sup>

Criteria for the choice of rehabilitation patients are an age range of 20–60 years, the intention to gain full occupation after rehabilitation, either new or existing, as well as being in a stationary rehabilitation setting for the first time. Furthermore, the equal representation of sexes and indicators for the rehabilitation treatment (functional restriction and diagnosis) will be ensured in the recruitment process.

Rehabilitation patients will be referred by their attending physicians, who will be in turn previously informed about the study and selected for inclusion. The patients will be informed and asked for their participation in the study. The attending physicians are going to fill out the protocol 'first contact phone call rehabilitation patient'.

The focus group of rehabilitation patients will meet towards the end of the stationary rehabilitation treatment on weeknights after the daily programmes in both clinics. The patients will be asked to participate in a telephone survey 3 months after the end of their rehabilitation treatment.

### Ethics and dissemination

The participation in the study will be voluntary. The consent of the participants can be withdrawn at any given time without a statement of reasons and without detriment in medical care. The nature and scope of the research will be explained to the study participants in written and oral form before onset of the study. Their consent will be documented by their signature on the consent form. The video tapes are going to be destroyed after the pseudonymisation is completed. The patients will additionally be assured that neither participation nor non-participation will be of any detriment to them. In addition, audio tapes will be destroyed no later than

10 years after publication of the study. Until this date, the tapes will remain sealed and only available to the persons involved in this research.

Results from the study will be published, independent of the nature of the results, in scientific peer-reviewed journals, in the PhD theses of the author (JS) and at conferences. Authorship will be granted only to those who fulfil the authorship criteria recommended by the International Committee of Medical Journal Editors. We will report the results using the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.<sup>67</sup>

### CONCLUSION

This qualitative study will use FGDs with OPs, RPs and GPs, as well as rehabilitation patients to explore experiences and attitudes in order to describe barriers and possibilities for improvement concerning the intersection between the workplace and rehabilitation institutions. We want to better understand the discrepancy between sustained expression of support for improved cooperation,<sup>16 18–20 22 23</sup> the possible benefits of improved cooperation with OPs<sup>24 25 37</sup> and the persisting structural exclusion of OPs from the rehabilitation process.<sup>9</sup>

This qualitative study is part of a larger mixed-method research project. In a first phase, blind spots in the knowledge about the issue are identified through a scoping review,<sup>9</sup> which also forms the basis of the key questions for the FGDs. This qualitative project phase will be preceded by a third phase, in which we will use a representative survey of a broadened spectrum of stakeholders in order to quantify and differentiate enhancing and hindering (structural) factors. The findings of this exploratory mixed-method project could lead to intervention projects, which would then be developed, introduced and evaluated in larger follow-up projects.

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in drafting the manuscript; SV-M, MAR, RK and GK were involved in critical revision of the manuscript. SV-M, JS, MAR, RK and GK were involved in final approval of the version and agreement to be accountable for all aspects of the work.

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**Competing interests** None declared.

**Patient consent** Obtained.

**Ethics approval** The research will be undertaken in accordance with the bylaws for medical practitioners of the Doctoral Association (Landesärztekammer) of the federal state of Baden-Württemberg and the declaration of Helsinki in their respective current versions. The study design will be given to the Ethics Committee of the Medical Faculty and University Hospital of Tuebingen for review before the onset of the study. The names of all study participants and all other confidential information fall under medical confidentiality and the regulations of the German Federal Data Protection Act (Bundesdatenschutzgesetz, BDSG).

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**Data sharing statement** All data relating to the study protocol are included in this paper. The results of the study will be published as soon as the project is completed.

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# **Experiences, attitudes and possibilities for improvement concerning the cooperation between occupational physicians, rehabilitation physicians and general practitioners in Germany from the perspectives of the medical groups and rehabilitation patients – a protocol for a qualitative study**

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### **3.2 Publication 2**

Stratil J, Rieger MA, Voelter-Mahlknecht S: Optimizing cooperation between general practitioners, occupational health and rehabilitation physicians in Germany: a qualitative study. Int Arch Occup Environ Health 2017, 90(8):809-821.

# Cooperation between general practitioners, occupational health physicians, and rehabilitation physicians in Germany: what are problems and barriers to cooperation? A qualitative study

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## Abstract

**Purpose** General practitioners (GPs), occupational health physicians (OPs), and rehabilitation physicians (RPs) fulfill different functions in the rehabilitation process, which need to be interlinked effectively to achieve a successful medical and occupational rehabilitation. In Germany, this cooperation at the interfaces is often suboptimal. The aim of this study was to identify and discuss perceived barriers to cooperation between GPs, OPs, and RPs.

**Methods** We used a qualitative study design with eight focus group discussions (FGD) with GPs, OPs, RPs, and rehabilitants. Two FGDs per expert group with 4–10 participants were conducted. The transcripts were analyzed using qualitative content analysis.

**Results** A number of obstacles to cooperation were reported by the participants, including (1) organizational (e.g., missing contact details, low reachability, schedule restrictions), (2) interpersonal (e.g., rehabilitants level of trust in OPs, low perceived need to cooperate with OPs, low motivation to cooperate), and (3) structural barriers (e.g., data privacy regulations, regulations concerning rehabilitation reports).

**Conclusion** The present data agree with study results from other countries, which addressed interfaces in the rehabilitation process. While some barriers could be overcome by the participants themselves, a multi-level stakeholder approach might be necessary. Future quantitative

research is required to assess the relative weight of the findings.

**Keywords** Cooperation · Interface · General practice · Occupational medicine · Rehabilitation · Health services research

## Background

General practitioners (GPs), occupational health physicians (OPs), and rehabilitation physicians (RPs) fulfill different functions in the rehabilitation process. These need to be interlinked effectively to achieve successful medical and occupational rehabilitation. In Germany, these interfaces have been criticized for many years as suboptimal. In particular, it is criticized that the involvement of OPs in the process is not sufficient (Dasinger et al. 2001). This finding was confirmed by two recent international literature reviews on the cooperation between OPs and RPs (Rijkenberg et al. 2013; Völter-Mahlknecht and Rieger 2014) as well as one review on the cooperation between GPs and OPs (Mosshammer et al. 2011).

The cooperation and communication of OPs and RPs have been investigated in a number of surveys involving RPs, OPs, and rehabilitants from Austria, the Netherlands, Belgium, and Germany (van Amstel and Buijs 2000; Seidel et al. 2003; Luedemann 2006; Vroeijsstijn-Nguyen and Brenner 2007; Rijkenberg 2012; Mueller et al. 2013). Although OPs and RPs expressed an interest in improving communication and cooperation (van Amstel and Buijs 2000; Seidel et al. 2003; Vroeijsstijn-Nguyen and Brenner 2007; Rijkenberg 2012; Mueller et al. 2013), these studies found a low intensity of communication and cooperation between OPs and RPs in

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all four countries. Especially, the studies from Germany indicated an exclusion of OPs from the rehabilitation process (Seidel et al. 2003; Tavs 2005; Luedemann 2006; Mueller et al. 2013). Other studies underlined the survey findings, e.g., by stating that there is no regular, systematic communication between RPs and OPs (Schwarze et al. 2013), that OPs often receive information on their rehabilitants' rehabilitation treatment months after the discharge or not at all (Manecke et al. 2008).

A general need for improvement of the cooperation between OPs and GPs, including in the field of rehabilitation was concluded by studies from Germany and the UK (Beaumont 2003; Beach and Watt 2003; Mosshammer et al. 2011, 2016). However, the cooperation and communication between GPs and OPs concerning rehabilitation have not yet been investigated intensively.

OPs, GPs, and RPs agree that an efficient interaction between the protagonists is necessary for successful rehabilitation and occupational reintegration, and that cooperation and communication need to be strengthened (de Bono 1997; Buijs et al. 1999; van Amstel and Buijs 2000; Jakobsson et al. 2002; Schochat et al. 2003; Beaumont 2003; Rijkenberg 2012).

A number of international literature reviews analyze interventions which improve the work-related health of rehabilitants (e.g., in regard to reduced sick leave and time to first return to work). These include individualized rehabilitation according to need and capacity for a specific workplace, work accommodations (e.g., ergonomic improvements), early contact of the worker to the workplace, and contact of the health care provider with the rehabilitant's workplace (Franche et al. 2005; Steenstra et al. 2006; Bethge and Mueller-Fahrnow 2008; Carroll et al. 2010; van Vilsteren et al. 2015). Most of these aspects lie within the responsibility of OPs.

For the setting of the German rehabilitation process, studies have indicated that improved cooperation in the rehabilitation process and especially the inclusion of OPs is beneficial in improving the occupational health of patients (Trowitzsch and Rust 2000; Kuehn et al. 2008; Mueller et al. 2009; Schwarze et al. 2013; Bethge et al. 2016).

The German code of social law differentiates between medical, occupational, and social rehabilitation. A patient is eligible for medical rehabilitation if the patient's earning capacity is substantially at risk or already diminished. In these cases, the funding agency will be the German Pension Fund (DRV) (BAR 2005; Hallier et al. 2013). Medical rehabilitation in Germany includes the treatment by physicians, physical and/or psychological therapy, stress tests and occupation-focused rehabilitation therapy (*MBOR*) as well as the provision of assisting devices and step-wise (occupational) reintegration (§ 15 SGB VI, §§ 26–31 SGB IX).

Rehabilitation therapy is initiated by patients by filing an application, which needs to include a health assessment report by a GP, OP, or another medical specialist (BAR 2005; Hallier et al. 2013). In the federal state of Baden-Wuerttemberg, OPs can initiate and coordinate an OP-guided rehabilitation (*B.Ä.R.*) (DRV Baden-Wuerttemberg). The funding agencies assess and decide on the patients' applications and if it is rejected, an objection can be filed. At the end of rehabilitation therapy, the rehabilitation institution should assess the need of occupational reintegration. A proposed plan for occupational reintegration needs to be approved by the rehabilitant, the treating physician, and the employer.

After rehabilitation, the physicians treating the patients (e.g., GP) are informed by the RP via a rehabilitation report and/or a short physician's letter. In the post-rehabilitation phase, GPs plan and organize the follow-up treatment and are involved in occupational reintegration of the patients (BAR 2005). The OPs' role includes assessing, preparing, and discussing options for the patients' occupational reintegration. To facilitate the reintegration process OPs can manage the provision of work accommodation (e.g., assisting devices) as well as determine the need and possibilities for retraining and job rotation (Leitner et al. 2009; Panter 2012).

The aim of this study was to identify and discuss barriers to cooperation between RPs, OPs, and GPs. Based on the literature (Rijkenberg et al. 2013; Völter-Mahlknecht and Rieger 2014), this article focuses on the role of OPs at these interfaces. In particular, we aim to answer—amongst others—the following questions: (1) How do the medical stakeholders and rehabilitants experience and evaluate the cooperation and communication in terms of quality and intensity? (2) What barriers and obstacles to cooperation and communication do the participants perceive and experience?

## Methods

We conducted an explorative qualitative study based on eight Focus Group Discussions (FGDs) and used qualitative content analysis for data analysis. The questions in the FGDs focused on (1) attitudes towards rehabilitation therapy (warm-up question), (2) the perceived role and function of OPs, GPs, and RPs in the rehabilitation process, (3) the informational need of patients and medical stakeholders, and (4) the experienced quality and intensity of cooperation and communication at the interfaces. The full interview guide will be provided by the authors upon request.

## Study population

Two FGDs were conducted each with rehabilitants (7 and 7 participants per FGD) as well as the main medical stakeholders: GPs (6 and 10), RPs (6 and 6), and OPs (4 and 5). The composition of participants followed the principle of maximal structural variation (Patton 1990) to represent the heterogeneity of protagonists in the field. The study sample is shown in Table 1. OPs were recruited via telephone from members of the Association of German Occupational and Company Physicians (Verband Deutscher Betriebs- und Werksärzte (VDBW)). RPs and patients were recruited through cooperation with the rehabilitation clinics Treatment Center Federsee (Therapiezentrum Federsee) in Bad Buchau (specializing inter alia in orthopedic medicine, oncology, and rheumatology) and the Huettenbuehl clinic of the Rehabilitation Center Bad Duerrheim (Reha-Zentrum Bad Duerrheim, Klinik Huettenbuehl) in Bad Duerrheim (specializing in alia in psychosomatic illnesses and mental health). GPs were recruited via E-mail

from medical practices associated with the Department for General Medicine at the Medical Faculty of the University of Tuebingen. An incentive of 50 € for physicians and 30 € for patients was offered.

## Focus group discussions

FGDs are an established method of data collection in qualitative research (Liamputtong 2013; Krueger and Casey 2014). Supported by guiding questions, the participants engage in an in-depth discussion of various topics (Morgan and Spanish 1984; Kitzinger 1994). The semi-structured FGDs were conducted between February and May 2015 (duration: 85–99 min) by two female researchers working for the Institute of Occupational Medicine, Social Medicine and Health Services Research at the University of Tuebingen. Three OPs and one GP were already acquainted with one interviewer. The participants were informed on the professional background of the interviewers and the aim of the research project prior to the discussions. Both GP-FGDs

**Table 1** Characteristics of focus group participants

Physicians	General practitioners	Occupational physicians	Rehabilitation physicians	Rehabilitants	Rehabilitants
Participants	<i>n</i> = 22	<i>n</i> = 9	<i>n</i> = 12	<i>n</i> = 15	Participants
Age average [median/(range)]	57/(40–67) years	55/(45–65) years	48/(34–58) years	53/(22–63) years	Age [median/(range)]
Sex: nbr. female	<i>n</i> = 9	<i>n</i> = 5	<i>n</i> = 6	<i>n</i> = 8	Sex: nbr- fem
Work experience as physician	27/(13–40) years	29/(12–39) years	13/(6–30) years	One: <i>n</i> = 4 Two: <i>n</i> = 1 Three: <i>n</i> = 1	Previous rehabilitation therapies
Work experience in specialization [median/(range)]	21/(7–33) years	20/(1–32) years	11/(3–31) years		
Type of employment	Solo practice: <i>n</i> = 13 Group practice: <i>n</i> = 9	Employed at one/several enterprise <i>n</i> = 1 Employed in Occupational health service for one/several enterprises: <i>n</i> = 4 Freelance for one/several enterprises: <i>n</i> = 4		21 days: <i>n</i> = 4 28 days: <i>n</i> = 3 35 days: <i>n</i> = 5 >35 days: <i>n</i> = 3	Planned duration of rehabilitation (days)
Practice site	Urban: <i>n</i> = 2 Rural: <i>n</i> = 10 Mixed: <i>n</i> = 10	Urban: <i>n</i> = 5 Rural: <i>n</i> = 0 Mixed: <i>n</i> = 4		Mental health <i>n</i> = 5 Musculoskeletal <i>n</i> = 5	Reason for rehabilitation
Practice size (patients per 3 months)	<700: <i>n</i> = 2 700–1400: <i>n</i> = 14 >400: <i>n</i> = 5	Responsible for SME: <i>n</i> = 8		Office work: <i>n</i> = 5 Industrial production: <i>n</i> = 3 Construction work: <i>n</i> = 1 Logistic sector: <i>n</i> = 1 Nursing care: <i>n</i> = 2 Pedagogue: <i>n</i> = 1 Cleaner: <i>n</i> = 1	Occupation
Rehabilitation applications [median/(range)]	35/(5–50) per Year			Small or medium enterprises: <i>n</i> = 7	Type of employer
Within catchment area of a company medical service?	In town: <i>n</i> = 7 In the country: <i>n</i> = 3 Both: <i>n</i> = 2 Without: <i>n</i> = 8			Business has OP: <i>n</i> = 8 Patient knows OP: <i>n</i> = 7	Relationship to OP (responses by patients)



and one OP-FGD took place at the University Hospital of Tuebingen resp. in our institute in Tuebingen. The other OP-FGD was held in a conference room in Stuttgart, which was closer to the participants, and the FGDs with RPs and patients were conducted in the rehabilitation clinics.

### Data analysis

We used qualitative content analysis (Mayring 2014) and the software MAXQDA 11 (VERBI GmbH; Berlin, Germany) for data analysis. First, the audio files were transcribed and pseudonymized. We went through the transcripts line by line and built inductive categories from the material. Step by step, passages were either subsumed under categories already built or a new category was formulated. After working through three out of the eight transcripts, we assumed that saturation was reached as no new categories could be identified. At this point, we revised the coding frame and assessed whether it met the research questions. Next, we applied the categories deductively on the complete set of all eight transcripts (Mayring 2014). Throughout the whole process, two to three (neutral) persons worked partly independently from each other on the same steps, partly in close discussion. This was done in order to fully exploit the richness of the data, to control for subjective blurring, and to achieve intersubjective certifiability by including and discussing multiple perspectives in the research process (Lucius-Hoene and Deppermann 2004). Content validation was carried out in a workshop in January 2015. Representatives of all parties were invited with a total of 16 GPs and OPs participating.

## Results

### Category system

We identified four main categories: (I) “perceived interfaces between the protagonists,” (II) “perceived problems in the rehabilitation process,” (III) “perceptions of and attitudes towards the own group and other stakeholders,” and (IV) “perceived role of protagonists in the rehabilitation process”.

The first main category (I) “perceived interfaces between the protagonists” included the categories (I.a) “Interfaces between protagonists in general,” (I.b) “prior...,” (I.c) “during...,” and (I.d) “after & at the end of rehabilitation treatment.” Each of these four categories consists of the subcategories “type of interface” and “quality and intensity of cooperation & communication.” The fifth category in the main category (I) was (I.e) “Barriers to cooperation.”

The second main category (II) “perceived problems in the rehabilitation process” consists of the categories (II.a)

“prior...,” (II.b) “during...,” and (II.c) “after & at the end of rehabilitation therapy.” Further categories in the main category (II) were (II.d) “concerning application process,” (II.e) “concerning the rehabilitation report & the short letter,” (II.f) “concerning small- & medium-sized enterprises (SMEs),” as well as (II.g) “issues of data privacy.”

### Cooperation and communication between the protagonists

First, we will outline how the participants perceived and experienced the cooperation and communication at their interfaces at the beginning, during, and at the end of rehabilitation in regard to the type of interface as well as the quality and intensity of communication and cooperation. This is displayed in Fig. 1.

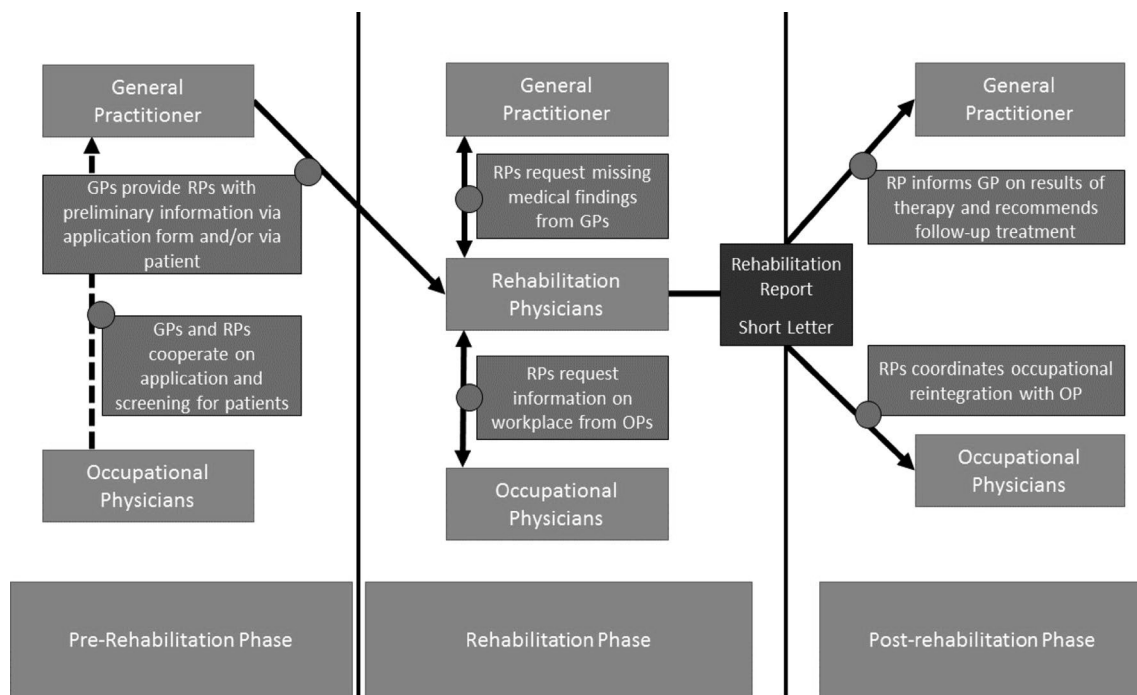
#### *Cooperation and communication at the interfaces in general*

The cooperation with OPs was described as low in intensity by all participants and OPs criticized being left out of the rehabilitation process. OPs stated they often did not receive information directly from the rehabilitation clinics. Further, they reported sometimes learning about a patient’s rehabilitation therapy weeks or months after discharge. While all OPs, most RPs, and some GPs stated that they wished to improve cooperation with OPs, some GPs and RPs as well as most patients were more hesitant.

The RPs mentioned GPs as their main cooperation partners in the rehabilitation process and characterized their cooperation as working well in general with need for improvement concerning the transmission of preliminary medical findings. In contrast, a number of GPs stated having little to no contact with RPs aside from the rehabilitation report and characterized the interface as functioning poorly. Most patients in the FDGs had little knowledge about the intensity and quality of cooperation at the interfaces. The rehabilitation process of two patients was initiated by an OP. These patients perceived that the cooperation between RPs and OPs was working well.

#### **Interfaces prior to rehabilitation treatment**

GPs provide RPs with preliminary medical findings prior to rehabilitation therapy via the application form or the patients themselves. According to RPs, documents were often missing and had to be requested from the GP, which resulted in a delay in assessment and treatment. Despite all four groups of stakeholders regarded a cooperation of GPs and OPs on screening and the application process as desirable and useful, none of our participants reported that such cooperation already existed.



**Fig. 1** Interfaces in the different stages of rehabilitation process between OPs, RPs, and GPs as reported by the participants in our study

#### *Interfaces during the rehabilitation treatment*

Providing information on the patient's workplace upon request of the RPs was reported to be a main interface between RPs and OPs. Most OPs reported that they were rarely asked to provide this information, while RPs reported rarely relying on the OPs assessments. Most OPs perceived this low flow of information as problematic as a sole reliance on subjective statements of patients was prone to bias. In regard to employees of larger companies RPs stated that this interface was working well. However, requesting workplace descriptions for patients from small and medium-sized enterprises (SME) was described as arduous and often not leading to the expected results.

#### *Interfaces after and at the end of the rehabilitation treatment*

RPs providing GPs, OPs, or medical specialists with information needed for the follow-up treatment was considered the main interface at the end of rehabilitation. This interface was mainly and often exclusively established through the short physician's letter and the rehabilitation report, according to all physicians.

Most OPs criticized that they rarely received the rehabilitation report directly from the rehabilitation clinics, even if the patient had given his/her consent and that OPs were rarely integrated in the occupational reintegration process,

especially in SMEs. This is in accordance with statements of RPs that they did not consider OPs to be obligatory recipients of the rehabilitation report and felt that integration of OPs was rarely necessary. Most patients were not aware of the OP's role in the occupational reintegration and of OPs as possible recipients of the rehabilitation report.

In the federal state of Baden-Wuerttemberg, OPs can initiate rehabilitation therapy as part of a structured OP-led rehabilitation process (*B.Ä.R.*). In general, OPs perceived this program as successful, although employees of SMEs rarely benefitted from it. Two patients reported to have made positive experiences with *B.Ä.R.* Patients, OPs, and one RP stated that communication in *B.Ä.R.* was working well.

#### **Barriers to cooperation**

Next, we will outline the organizational, interpersonal, and structural barriers to cooperation and communication found by means of the FGDs, as displayed in Table 2 and Fig. 1. Organizational barriers refer to practical barriers, which arose in the working routine of the stakeholders. Interpersonal barriers refer to obstacles, which the participants ascribed to the role, character, or interests of stakeholders. Structural barriers refer to barriers, which were perceived as being caused by regulations and the structure of the system the protagonists are placed in.

**Table 2** Barriers to cooperation between OPs, RPs, and GPs during the rehabilitation process found in our study with quotations from the interviews

Subcategories	Quotations
<b>Organizational barriers</b>	
Missing contact details of OPs	F2: "...when we're dealing with small companies that only see the OP once or twice a year, then [contacting the OP] is practically impossible." (RP II, 127–130)
Low reachability of RPs, OPs, and GPs	M1: "...today I contacted a company physician and it took five phone calls until I had him on the line. He's only there Tuesdays and Thursdays and only at this and that time. Than that has to fit into my schedule." (RP I, 62)
Time restriction of RPs and GPs	M1: "[It would be helpful] to facilitate the flow of information to occupational or company physicians [...], but at the moment I have no real idea how we could manage this in our daily routines." (RP II 83)
Need for fast coordination on short notice	M1: "Naturally [coordination with OPs regarding occupational reintegration] must happen in a timely manner... [Recommendations can only be made during the course of rehabilitation therapy]. And then it needs to be quick, then you can't say something like: okay, you'll get your answer in ten days-... That needs to be done within two or three working days." (RP II, 303)
<b>Interpersonal barriers</b>	
Relationship between patients and OPs and level of trust of patients	F2: "But to the company physicians, there's hardly any contact, if any. And that has a lot to do, speaking from my own experience here, a lot to do with prejudices and fears [of the rehabilitants] that confidentiality will be neglected with regard to their employers, etc." (RP I, 40)
Low perceived need to cooperate with OPs	M4: "...[with regard to workplace assessments] you usually reach a reasonable result in, up to 90 percent [of patients]. In rare cases, the occupational health physician or company physician actually does send us some kind of protocol from the workplace. [...] Usually there are hardly any problems [in the assessment without input from OPs]." (RP II, 96–98)
Lacking initiative of RPs, OPs, or GPs	F2: "In the 18 years [in which I've worked as a GP], I have never had contact with an OP, I don't know what they do [...] M5: "The fact is that contact is made primarily through our own private initiatives, and usually ends negatively." (GP I, 364–367)
<b>Structural barriers</b>	
Structure and length of rehabilitation report	M3: "[If we would call the GPs more often and talk on the phone], more information would be conveyed naturally than in just a report. Aside from that, as I mentioned, we are unfortunately formally obliged to formulate eight to ten-page reports that, as a rule, the physicians don't even read or only read small parts of." (RP I, 191)
Data privacy regulations	F4: "If we could write an E-Mail now, [...] I believe that would be more helpful, if they could chose the time when to read this information themselves." M1: "And that's where the data privacy regulations of the German pension insurance do not take effect. Because we still don't have a secure E-Mail system. Right now we're required to refrain from sending any E-mails with patient data to anyone, not even to the GP." (RP I, 279–280)
Different usage of terms for ability to work	Interviewer: > "...it is often difficult for the rehabilitant that they say their GP tells them something different than the rehabilitation physician. My OP says something completely different. Each has their own philosophy about what I can do, ... my state of health." W2: "But that sometimes depends on these differences in language use." (OP I, 188–193)
Small- and medium-sized enterprises	M1: "Workplace descriptions are available for large companies. There are no descriptions for small and medium -sized enterprises, or only to a limited extent" (RP II, 95)

In brackets: section in the transcript. In bold: pseudonymization codes of the interview partners (F: female participant, M: male participant)

### Organizational barriers

According to RPs, missing contact details posed a barrier to cooperation with OPs. This information was often missing in the application and could not be provided by patients. The latter was supported by the interviewed patients, as a considerable number of patients did not know the OP responsible for them.

Low reachability of OPs and RPs was mentioned as barriers by all groups of physicians. GPs and OPs both

perceived contacting RPs as cumbersome and complicated due to a low reachability and unclear responsibilities within the rehabilitation clinic.

Time restrictions on the part of the GP were perceived as a barrier to communication by RPs, e.g., GPs often had no time to discuss individual cases. GPs also perceived time restrictions as a barrier to communication with OPs and RPs, but associated these deficits in cooperation with shorter working hours of OPs and RPs in comparison with GPs.

RPs stated that coordination with OPs concerning occupational reintegration was complicated because coordination needed to materialize quickly and on short-notice. The assessment of the patients' needs for occupational reintegration is made at a late stage of rehabilitation therapy. Therefore, communication with OPs and feedback needed to be completed within few working days, which was often not regarded as feasible.

The patients seemed to have little knowledge about the organizational barriers at the interfaces.

#### *Interpersonal barriers*

A low need for cooperation with OPs was mentioned by RPs. While OPs perceived an external workplace description as important for successful rehabilitations, RPs felt they were able to sufficiently assess the patients' workplaces and therefore rarely requested information. The patients believed to be able to sufficiently inform RPs on their workplace.

Some RPs believed the integration of OPs into the occupational reintegration process as rarely necessary and considered OPs to be optional recipients of the rehabilitation report. OPs in both FGDs attributed their experience of being left out of the rehabilitation process to an insufficient knowledge of GPs and RPs of the OPs functions and capabilities. The OPs' perceptions were supported by one RP who was not aware that OPs were involved in occupational reintegration at all. Similar statements were made in one GP-FGD and both patient-FGDs. They responded that they were not aware of the OPs' function in general and therefore did not know of the OPs' role in the rehabilitation process.

Lacking initiative on part of OPs and RPs was reported in both GP-FGDs to pose a barrier to cooperation. Some GPs reported never or hardly ever having experienced an OP trying to contact them. Similar experiences were reported by RPs and OPs about the other groups of physicians. RPs and OPs both experienced that the cooperation was greatly improved when physicians on either side were committed to OP-RP-collaboration.

RPs and OPs both stated that patients' concerns often posed a barrier to cooperation between these protagonists. Some rehabilitants would not allow RPs to contact OPs (e.g., to request information). Moreover, patients demanded to decide if OPs should receive the rehabilitation report and thereby whether they were included in the reintegration process. The patients' demands were supported by RPs and GPs alike. Therefore, the relationship and trust between patients and OPs were considered important for the cooperation between RPs and OPs. In the interviews, the majority of patients reported either not to know or not to trust their OPs. Some feared that the OP might inform the employer

about their condition. This aligns with RPs' experiences. In contrast, two patients reported having a good and trustful relationship with their OP. Some OPs attributed these attitudes to an insufficient knowledge about the OPs' medical confidentiality.

#### *Structural barriers*

Data privacy regulations posed an obstacle to cooperation between RPs and OPs according to these protagonists. The patient's approval is needed for direct communication between RPs and OPs and also for OPs to receive the rehabilitation report. According to RPs, data privacy regulations in Germany prohibit the use of E-mails as long as no proper encryption was made available by the DRV.

Structure and length of the rehabilitation report were repeatedly reported as posing a problem by OPs, RPs, and GPs. It was perceived as too long and often containing unnecessary information. According to RPs, this led to recipients not to read the report as a whole and to miss relevant information. GPs argued that a leaner report would also allow shorter delivery times. Some RPs did not consider the length of the report to be an issue and argued that the comprehensiveness of the information might be needed by specialists. Length and structure were attributed to regulations set by the funding agencies.

According to OPs, RPs, and GPs, differing assessment of the patient's working ability posed obstacles at the interfaces. In the worst case, this could lead to the patient losing his/her job. GPs attributed the differences to funding agencies' regulations, which incentivized RPs to discharge patients in a status able to work. RPs ascribed the differing assessments to GPs not reading the whole rehabilitation report, a superficial knowledge of the patients' occupations, and being unfamiliar with legal definitions. OPs attributed these differences in the assessment to a different understanding of key terms (e.g., of the term *piecework*) and an insufficient knowledge of RPs on the patients' workplaces. Some patients had received contradicting information concerning their ability to work by different physicians.

Collaboration with OPs was regarded as complicated by RPs when the rehabilitant worked in SMEs as obtaining workplace information was time-consuming and the reachability of OPs was lower. These experienced issues with SMEs are in accordance with statements from OPs and rehabilitants.

## **Discussion**

Participants in this qualitative study perceived the cooperation between GPs, RPs, and OPs in the rehabilitation process as not working smoothly. Especially OPs felt excluded

from the process. RPs, OPs, GPs, and rehabilitants reported a number of obstacles to cooperation, including organizational, interpersonal, and structural barriers. These barriers are described in Fig. 2. While the nature of the method used does not allow conclusions concerning the representativeness of issues highlighted by the participants, our findings are in line with studies conducted in Germany and Western Europe.

The low levels of integration of OPs are in accordance with a number of German publications (Rijkenberg et al. 2013; Völter-Mahlknecht and Rieger 2014).

The organizational barrier of a lack of time and the reachability of communication partners were mentioned by OPs and RPs from the Netherlands, Belgium, and Austria (Vroeijenstijn-Nguyen and Brenner 2007; Rijkenberg 2012). These issues were also addressed as barriers to the cooperation between OPs and other medical specialists (Mosshammer et al. 2011).

As an interpersonal barrier, we found that the withholding of contact approval by patients could pose a barrier to cooperation between RPs and OPs. This finding is supported by a survey of German rehabilitants (Luedemann 2006) and RPs from Austria and Belgium (Rijkenberg 2012).

The interpersonal barrier of RPs and GPs being unaware of the OPs’ role and function in the rehabilitation process was reported in studies from Germany, the Netherlands, Belgium, and Austria (van Amstel and Buijs 2000; Rijkenberg 2012; Mueller et al. 2013; Mosshammer et al. 2012).

GPs’ mistrust of OPs was reported in studies from Germany, the Netherlands, Belgium, and the UK, e.g., in terms of OPs not working in the interest of the patient and not sticking to confidentiality regulations (Buijs et al. 1999; Nauta and von Grumbkow 2001; Pfaff et al. 2009; Mosshammer et al. 2011). Two Dutch surveys found similar perceptions among RPs (van Amstel and Buijs 2000; Vroeijenstijn-Nguyen and Brenner 2007).

A strength of the study is that not only physicians, but also rehabilitants were involved as main stakeholders. We were also able to attain a nearly optimal heterogeneity in the FGDs of GPs, RPs, and rehabilitants (e.g., on the characteristics: sex, working experience, company size of OPs, disease patterns). As the recruitment of OPs turned out to be complicated, a selection bias of OPs with a strong interest in the topic cannot be ruled out. Consequently, the actual composition of our focus groups deviates from the planned composition, especially concerning the OPs. As some OPs had worked as employees of occupational service providers and as staff doctors in the past, we believe their perspectives is represented in our interviews as well. As some studies indicate a strong heterogeneity of rehabilitation clinics, a bias in the RPs and rehabilitants perception due to unwanted group effects cannot be precluded. As the study was conducted by occupational health experts, biased responses due to social desirability are possible, but it can be considered low due to the richness of our data and the critical statement made in the discussions.

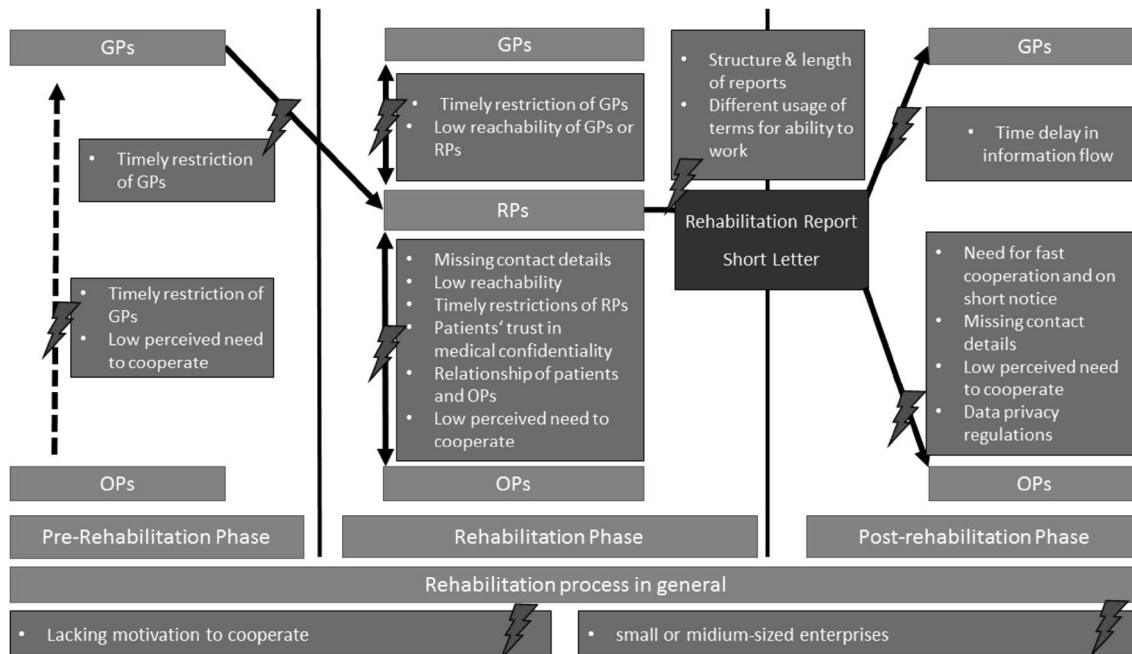


Fig. 2 Barriers to cooperation and communication at the interfaces in the rehabilitation process as mentioned by GPs, RPs, Ops, or patients

Our study provides an overview of barriers to the cooperation perceived by German GPs, RPs, OPs, and rehabilitation patients. The main problem area related to organizational, interpersonal, and structural barriers. As discussed, the presented data generally align with the results of studies from other European countries. Future quantitative research is required to better assess the weight of the suggestions presented here.

Some of the barriers could be overcome by the protagonists themselves or by regional cooperation in the current milieu. Other barriers will require interventions in the areas of finance, data regulation, and the rehabilitation report requirements. Therefore, it seems that ongoing interventions on various levels and by different stakeholders might be necessary, including state and federal actors.

We suggest focusing on the organizational and interpersonal barriers, as these might be easier to overcome by the stakeholders themselves. OPs should focus on how they can foster trust of employees in the medical confidentiality and on how to deepen doctor-patient relationships. Also, OPs should focus on informing GPs and RPs on the mutual benefits of strengthening cooperation. One opportunity could lie in joint continuing medical education programs. Furthermore, top-down interventions could focus on strengthening the role of OPs in the rehabilitation process, e.g., by making the contact details or information on the workplace an obligatory part of the application form.

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#### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical approval** Informed consent was obtained in writing and verbally from each participant included in the study. The ethics committee of the Faculty of Medicine at the University of Tuebingen approved the study protocol. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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### **3.3 Publication 3**

Stratil JM, Rieger MA, Volter-Mahlknecht S: Cooperation between general practitioners, occupational health physicians, and rehabilitation physicians in Germany: what are problems and barriers to cooperation? A qualitative study. *Int Arch Occup Environ Health* 2017, 90(6):481-490.



# Optimizing cooperation between general practitioners, occupational health and rehabilitation physicians in Germany: a qualitative study

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## Abstract

**Purpose** To achieve successful medical rehabilitation and timely return to work, general practitioners, occupational health and rehabilitation physicians need to cooperate effectively. This cooperation, however, can be hampered by organizational, interpersonal, and structural barriers. In this article, we present and discuss suggestions proposed by physicians and patients on how these barriers can be overcome.

**Methods** We conducted eight qualitative focus group discussions with general practitioners (GPs), occupational health physicians (OPs), rehabilitation physicians (RPs) and rehabilitation patients, which we analyzed with qualitative content analysis methods.

**Results** Room for improvement exists with regard to (1) regulation (e.g. formalized role and obligatory input of occupational physicians), (2) finance (e.g. financial incentives for physicians based on the quality of the application), (3) technology (e.g. communication by email), (4) organizational procedures (e.g. provision of workplace descriptions to RPs on a routine basis), (5) education and information (e.g. joint educational programs, measures to improve the image of OPs), and (6) promotion of cooperation

(e.g. between OPs and GPs in regards to the application process).

**Conclusions** Many suggestions are practical and could be implemented into the daily routine of physicians, while others demand multi-level, multi-stakeholder approaches. Our findings are supported by numerous international studies (especially from Western Europe). Future quantitative research could assess the relative weight of these findings. Feasibility and effectiveness of the proposed suggestions should be tested in controlled interventional studies.

**Keywords** General practice · Occupational medicine · Rehabilitation · Health services research · Interfaces · Interprofessional cooperation

## Background

Occupational health physicians (OPs), general practitioners (GPs), and rehabilitation physicians (RPs) fulfill different functions in the rehabilitation process, which need to be connected and coordinated effectively to achieve successful medical and occupational rehabilitation in employees.

International studies show that representatives of all three physician groups agree that their cooperation and communication are necessary for successful rehabilitation (van Amstel and Buijs 2000; Friesen et al. 2001; Edlund and Dahlgren 2002; Schochat et al. 2003; Beaumont 2003a; Rijkenberg 2012).

These statements are supported by several studies from Germany, which have indicated that improved cooperation in the rehabilitation process and especially the inclusion of OPs is beneficial in improving the occupational participation of patients (Kuehn et al. 2008; Mueller et al. 2009; Schwarze et al. 2013; Bethge 2016).

**Electronic supplementary material** The online version of this article (doi:10.1007/s00420-017-1239-6) contains supplementary material, which is available to authorized users.

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Moreover, a number of interventions have been found to improve the work-related health of patients in international literature reviews (e.g. in regards to reduced sick leave and time to first return to work). A number of these interventions lie within the responsibility of OPs in the German health care system, including rehabilitation treatment tailored to demands of the patient's workplace, work accommodations such as ergonomic improvements, and early contact of the worker to the workplace (Franche et al. 2005; MacEachen et al. 2006; Carroll et al. 2010; van Vilsteren et al. 2015).

Insufficient cooperation and communication between GPs, OPs and RPs has been identified as a relevant problem in numerous studies, and the need for improvements is acknowledged by all those involved (Seidel et al. 2003; Beaumont 2003a, b; Beach and Watt 2003; Vroeijerstijn-Nguyen and Brenner 2007; Mueller et al. 2013; Rijkenberg et al. 2013). In particular, several studies have identified an insufficient flow of information from and to OPs as a main barrier to a streamlined rehabilitation process in employees (Schupp 2001; Dasinger et al. 2001).

Surveys conducted among RPs, OPs, and rehabilitation patients from Austria, the Netherlands, and Belgium found a low intensity of communication and cooperation between OPs and RPs in all three countries (van Amstel and Buijs 2000; Vroeijerstijn-Nguyen and Brenner 2007; Rijkenberg 2012). German surveys in particular reported strong feelings of being excluded from the rehabilitation process among OPs (Seidel et al. 2003; Tavs 2005; Luedemann 2006; Mueller et al. 2013). These findings have been underlined by several German studies which reported that communication between RPs and OPs still does not take place on a regular basis (Schwarze et al. 2013) and that OPs were often informed about their patient's rehabilitation treatment months after their discharge, if at all (Behrens 2000; Manecke et al. 2008). Another study conducted in Germany found that OPs were mentioned or addressed in less than 1/8 of all discharge letters from rehabilitation clinics, and most of these references to OPs were negative (Jankowiak et al. 2013). These findings have been confirmed by two recent international literature reviews on the cooperation between OPs and RPs (Rijkenberg et al. 2013; Voelter-Mahlknecht and Rieger 2014).

Similar findings have been reported in a literature review on the cooperation between GPs and OPs (Mosshammer et al. 2011). The rehabilitation process has been identified as a main interface between GPs and OPs (Mosshammer et al. 2011), and room and need for improvement at this interface has been identified by numerous studies, including several recent studies from Germany (Beaumont 2003a; Beach and Watt 2003; Mosshammer et al. 2011, 2012, 2016).

In a previous publication within the same qualitative research project, we identified organizational, interpersonal, and structural barriers leading to low levels of cooperation (Stratil et al. 2017). Organizational barriers included: Missing contact details of OPs, low reachability of RPs, OPs, and GPs, time restrictions of RPs and GPs, and problems caused by the RPs' need for fast coordination with OPs on short notice. In regards to interpersonal barriers, patients as well as physicians reported that low levels of trust and poor relations between employees and OPs might be a barrier, as patients have to agree to OPs being included in the rehabilitation process and being provided with patient data. Furthermore, patients and physicians have expressed concerns that OPs might not follow confidentiality regulations and might have conflicts of interest due to their relationship with the employer. Other interpersonal barriers included lacking initiative or interest in communication by RPs, OPs, or GPs and a low perceived need to cooperate with OPs. For example, while OPs perceived a third-party workplace description as important for successful rehabilitations, RPs felt they were able to sufficiently assess the patients' workplaces, believed the integration of OPs into the occupational reintegration process as rarely necessary, and considered OPs to be optional recipients of the rehabilitation report (Stratil et al. 2017). These findings are in line with other studies conducted in Germany or Western Europe (Valk and van den Broek-Porius 2007; Vroeijerstijn-Nguyen and Brenner 2007; Mosshammer et al. 2011; Rijkenberg 2012; Mosshammer et al. 2014).

The overall aim of this research project was to identify barriers to and ways to improve the cooperation between RPs, OPs, and GPs in the rehabilitation process in Germany (Voelter-Mahlknecht et al. 2017). Following recommendations of the Medical Research Council (MRC) (Campbell et al. 2000) we first conducted a systematic literature review (Voelter-Mahlknecht and Rieger 2014). The first part of the qualitative study focused on the assessment of the cooperation as well as the identification of barriers and determinants for good cooperation and communication (Stratil et al. 2017). The present, second part focuses on possible solutions as reported by the four groups of stakeholders. In particular, we aim to answer the following questions:

1. What kind of practical advice for improved communication and cooperation at the interface between GPs, OPs and RPs can be deduced from the personal experiences of the different stakeholders?
2. What opportunities for optimization beyond the improvement of communication and cooperation do the medical parties and the rehabilitation patients point out?

Based on our review of the literature, we will focus on the role of OPs in the rehabilitation process (Rijkenberg et al. 2013; Voelter-Mahlknecht and Rieger 2014).

## Methods

This explorative qualitative study is based on eight Focus Group Discussions (FGDs) and used qualitative content analysis for data analysis (Mayring 2014). These methods are laid out in more detail in our study protocol and our publication on barriers to cooperation, in which we also contextualize the roles of the protagonists as well as the specific barriers addressed within the German health care system (Voelter-Mahlknecht et al. 2017; Stratil et al. 2017). In our reporting we followed recommendations outlined in the COREQ statement (Tong et al. 2007).

In short, two FGDs with seven participants on average (ranging from 4 to 10) were conducted with each of the three professional groups (GPs, RPs and OPs) as well as with patients as a fourth stakeholder group. The semi-structured FGDs with a duration between 85 and 99 min were conducted between February and May 2015. They were conducted by one of two female researchers of which one is an associate professor for occupational, social and environmental medicine for social medicine (author SVM) and the other an occupational safety engineer. Both were working for the Institute of Occupational and Social Medicine and Health Services Research at the University Hospital Tübingen, had previous experience in qualitative research and received theoretical training in our institute.

We informed the participants prior to the FGD about the professional background of the interviewer and the aim of the research project. One interviewer (SVM) was already acquainted with three OPs and one GP.

The study's purposive sample is shown in Table 1. We used a purposive sampling technique aiming for maximal structural variation in the composition of our sample in order to represent the heterogeneity of the stakeholder involved in the process we aimed for (Palinkas et al. 2015). OPs were recruited via telephone from members of the Association of German Occupational and Company Physicians (Verband Deutscher Betriebs- und Werksärzte (VDBW)) by one of the authors (JMS). RPs and patients were recruited through cooperation with the rehabilitation clinics Treatment Center Federsee (Therapiezentrum Federsee) in Bad Buchau (specializing in orthopedics, oncology and rheumatology) and the Huetttenbuehl clinic of the Rehabilitation Center Bad Duerrheim (Reha-Zentrum Bad Duerrheim, Klinik Huetttenbuehl) in Bad Duerrheim (specializing in psychosomatic and mental health) via contact persons. GPs were recruited via email from medical

practices associated with the Department for General Medicine at the University of Tübingen.

The pilot tested FGD-guide focused on (1) attitudes towards rehabilitation therapy (warm-up question), (2) the perceived role and function of OPs, GPs, and RPs in the rehabilitation process, (3) the informational need of patients and medical stakeholders, and (4) the perceived quality and intensity of cooperation and communication at the interfaces between the different groups. The full interview guide can be provided upon request.

The discussions were digitally recorded on audio and video, with the videos being deleted after the pseudonymization of the transcript. No field notes were taken. The transcribed and pseudonymized interviews were assessed with the methodological orientation of content analysis using the method of qualitative content analysis (Mayring 2014) and the software MAXQDA 11 (VERBI GmbH, Berlin, Germany). Two to three researchers went through the transcripts line by line and built inductive categories from the material. After coding three out of the eight transcripts we could identify no further categories and therefore assumed saturation. We then revised the coding frame and assessed whether it met the research questions. Next, we applied the categories deductively on the complete set of all eight transcripts. In order to control for subjective blurring and to achieve intersubjective creditability, two to three persons created and applies the categories partly independently from each other, and partly in close discussion (Mayring 2014). The transcripts were not returned to participants for comments or corrections, but in January 2015 we conducted a workshop for content validation in which we presented a summary of the content of the FGDs and preliminary findings to the participants. Representatives of all parties were invited and a total of 16 GPs and OPs participated.

## Results

We identified four main categories: (I) "perceived interfaces between the protagonists", (II) "perceived problems in the rehabilitation process", (III) "perceptions of and attitudes towards the own group and other stakeholders" and (IV) "perceived role of protagonists in the rehabilitation process". The category system is displayed in Electronic Supplementary Material, Annex I. The first two categories were the focus of the preceding publication on barriers to communication and cooperation. This publication is primarily based on the categories "Suggestions for improvements" which is a subcategory to several of the categories (i.e. II.a–g; III, IV) in the category system.

We assigned the suggestions proposed by our four groups of stakeholders in six categories: (O) organizational, (T) technology, (F) finance, (R) regulation, (E) educational and information, and (P) promotion of cooperation. These

**Table 1** Characteristics of the study population

Physicians	General practitioners	Occupational health physicians	Rehabilitation physicians	Patients	Patients
Participants	<i>n</i> = 22	<i>n</i> = 9	<i>n</i> = 12	<i>n</i> = 15	Participants
Age average [median/(range)]	57/(40–67) years	55/(45–65) years	48/(34–58) years	53/(22–63) years	Age [median/(range)]
Gender: N. female	<i>n</i> = 9	<i>n</i> = 5	<i>n</i> = 6	<i>n</i> = 8	Gender: N. female
Work experience as physician	27/(13–40) years	29/(12–39) years	13/(6–30) years	One: <i>n</i> = 4	Previous rehabilitation therapies
Work experience in specialization [median/(range)]	21/(7–33) years	20/(1–32) years	11/(3–31) years	Two: <i>n</i> = 1	
Type of employment	Solo practice: <i>n</i> = 13 Group practice: <i>n</i> = 9	Employed at enterprise: <i>n</i> = 1 Employed in occupational health service: <i>n</i> = 4 Freelance: <i>n</i> = 4		Three: <i>n</i> = 1	Planned duration of rehabilitation (days)
Practice site	Urban: <i>n</i> = 2 Rural: <i>n</i> = 10 Mixed: <i>n</i> = 10	Urban: <i>n</i> = 5 Rural: <i>n</i> = 0 Mixed: <i>n</i> = 4		21 days: <i>n</i> = 4 28 days: <i>n</i> = 3 35 days: <i>n</i> = 5 >35 days: <i>n</i> = 3	Reason for rehabilitation
Practice size (patients per 3 months)	<700: <i>n</i> = 2 700–1400: <i>n</i> = 14 >1400: <i>n</i> = 5	Responsible for SME: <i>n</i> = 8		Mental health <i>n</i> = 5 Musculoskeletal <i>n</i> = 5	
Rehabilitation applications [median/(range)]	35/(5–50) per year			Office work: <i>n</i> = 5 Industrial production: <i>n</i> = 3 Construction work: <i>n</i> = 1 Logistic sector: <i>n</i> = 1 Nursing care: <i>n</i> = 2 Pedagogue: <i>n</i> = 1 Cleaner: <i>n</i> = 1	Occupation
Within catchment area of a company medical service?	In town: <i>n</i> = 7 In the country: <i>n</i> = 3 Both: <i>n</i> = 2 Without: <i>n</i> = 8			Small or medium enterprises: <i>n</i> = 7	Type of employer
Setting of data collection	Meeting room in the University Hospital Tübingen resp. in our institute in Tübingen	Meeting room in our institute in Tübingen and conference room in Stuttgart	Meeting room in rehabilitation clinics	Business has OP: <i>n</i> = 8 Patient knows OP: <i>n</i> = 7	Relationship to OP (responses by patients)

categories are displayed in Table 2 with exemplary text passages and suggestions in Table 3.

### Suggestions to improve the interfaces prior to rehabilitation

In Germany, patients in need of rehabilitation therapy need to apply for funding at their insurance, in general the public German Pension Insurance (DRV). The application needs to include a health assessment report by a GP, OP, or another medical specialist. GPs in our interview criticized high rejection rates, a time consuming application process, insufficient remuneration for the medical support of the patients' application, and lack of compensation for filing objections to rejected applications. Some OPs therefore suggested that an improved cooperation between GPs and OPs in the application process could be beneficial for GPs and patients. It was proposed, that (P.1) OPs could add an OP's assessment to the GP's application, which could increase the acceptance rate in the view of both GPs and OPs. They also suggested (P.2) that OPs could file objections to rejected applications, which would save time for GPs. GPs and OPs themselves could promote and initiate this form of cooperation with local and regional stakeholders, e.g. by promoting this form of cooperation by arguing with the mutual benefits of such arrangements.

### Interfaces at the beginning and during rehabilitation

RPs and OPs regarded the provision of information on the patient's workplace and occupational setting as an important interface and reported missing contact details of OPs as a main barrier, although the application form calls for the OP's contact details. Both groups of physicians agreed that the contact details of the patient's OP should be provided to RPs by default. This could be accomplished by encouraging, incentivizing, or obliging patients and the physician supporting the application process to provide the OPs contact details to RPs. OPs suggested that (R.1) the funding agencies should make this segment an obligatory part of the application form, without which the application should be rejected. GPs rejected this proposal and suggested (F.1) a raise of the remuneration instead. An increase could motivate the physician to invest more time in this task and—as a result—improve the quality of the applications. RPs proposed (F.2) a conditional financial incentive for the physician for handing in an application fulfilling certain quality criteria (e.g. containing the OP's contact details). Other suggestions made by OPs to improve the provision of RPs with an OP's assessment of the workplace included (R.2) making such a description by the patient's OP an obligatory part of the application form. This proposal was rejected by other OPs and the majority of RPs. As a less intrusive suggestion, one OP proposed

**Table 2** Coding frame of categories included in this study, and coding examples

#### Suggestions related to

##### Regulation

**M1:** "...everywhere where there's an interface with the workplace, that's where we [OPs] play an important role. I don't understand why it's not standard for us to be the actors during the progressive reintegration phase. It should be like that as a matter of principle, but it's not." OP II, 150

##### Financing

**Interviewer:** "Missing diagnoses. Would it be possible to make it more attractive to GPs by increasing the remuneration for a rehabilitation application?" **M1:** "Absolutely." **F2:** "I agree." **M1:** "Absolutely." RP II, 335–338

##### Technical and technological solutions

**F4:** "I can also imagine that calls are considered bothersome by the GP. If we could write an email now,... I believe that would be more helpful, if they could chose the time when to read this information themselves, or so." RP I, 178–280

##### Organizational procedures

**M1:** "What you could do [to provide the occupational physician information if the patient doesn't fully trust him/her], would be to simply reduce it to the sociomedical assessment. So that he [the OP] doesn't get all of the other information, just the sociomedical assessment." RP I, 121–125

##### Education and Information

**M2:** "...the company physicians are always rather exotic for the other two groups, doing something that a general practitioner doesn't really know about, and the same for the reha-physician. And this lack of knowledge about each other naturally leads to misjudgments." OP II, 101–102

##### Promoting cooperation

**M3:** "... it would naturally be nice if, when you work in a company, and you always had similar or the same rehabilitation clinics where you sent people. Then contact could gradually be built up." OP II, 254–257

In brackets: section in the MAXQDA file, in bold: pseudonymization codes of the interview partners

*F* female participant, *M* male participant, *OP* FGD with occupational health physician, *RP* FGD with rehabilitation physicians, *GP* FGD with general practitioners

**Table 3** Suggestions for improving cooperation and their presumed acceptability, feasibility and efficacy, based on statements made by the participants in our interviews

	Main addressee	Intervention	Opinion in interviews			
			GPs	OPs	RPs	Rehab
Application	OPs/GPs	P.1 Promote cooperation between OPs and GPs on application: OPs could add assessment to GPs application	↑	↑	U	U
		P.2 OPs could write objection to rejected applications				
		R.1 Funding agencies should make an OP's contribution to application form (i.e. statement (R.1)/work place description (R.2)) an obligatory prerequisite for acceptance of application	↓	↑	U	M
		R.2				
		F.1 Remuneration of doctors for filing rehabilitation applications should be increased	↑	↑	↑	U
		F.2 A conditional financial incentive for application forms containing all necessary information should be introduced	U	U	↑	U
Rehabilitation report	Funding agencies	R.3 Funding agencies should introduce regulations in order to shorten the rehabilitation report	↑	↑	M	U
		R.4 Funding agencies should introduce regulations to allow a division of the rehabilitation report into segments and have recombined and tailored reports send to recipients (i.e. OPs)	U	U	↑	U
		R.5 OPs should be obligatory recipients of the rehabilitation report	↓	↑	M	M
		R.6 The default status of OPs as recipient should be introduced, instead of an explicit opt-in decision of patients/RPs	U	↑	U	U
	OPs/RPs/GPs	O.5 OPs, RPs, and GPs should developing a joint definition or understanding of terms, i.e. regarding the patient's ability to work	U	↑	U	U
	Funding agencies	T.1 A revised discharge letter with predefined terms relating to the patient's ability to work should be introduced (i.e. by the DRV)	U	↑	U	U
Evaluation	Funding agencies	R.7 To improve evaluation of the rehabilitation, a structured follow-up program including medical consultation and examination i.e. by a GP should be introduced	↑	↑	U	U
		R.8 A structured post-discharge check-up conducted by OPs should by introduced (i.e. by the funding agencies)	↑	U	U	U
	RPs	O.2 Introduce an evaluation system based on rehabilitation clinics sending questionnaires to GPs 6 months after rehabilitation	↑	U	↑	U
		O.3 Have rehabilitation institutions send a reminder to GPs to evaluate the results of rehabilitation	↑	U	↑	U
Occupational reintegration	RP/OPs	P.3 Promote RPs reaching out to OPs if continued employment of patient is at risk	U	↑	U	U
	Funding agencies	R.9 Have OPs contribution to occupational reintegration made obligatory (i.e. by the funding agency)	↓	M	↓	M
	Employer/OPs	O.4 OPs could make an arrangement with the employer, to have the employers' acceptance of the RPs' proposal for occupational reintegration to depend on the OPs assessment	U	↑	U	U
Post-rehab. treatment	Funding agencies	F.3 Organize financing of post-rehabilitation treatment through the rehabilitation institutions (i.e. through voucher booklets)	↑	U	U	U
Communication	OPs, RPs, GPs	T.2 Increase the use of e-mails in the communication between OPs, GPs, and RPs (i.e. by introducing appropriate software)	↑	↑	↑	U

**Table 3** continued

	Main addressee	Intervention	Opinion in interviews			
			GPs	OPs	RPs	Rehab
Joint medical education	OPs, RPs, GPs	E.2 Introduce/increase joint continuing medical education programs between RPs, OPs, and GPs	M	↑	↑	U
	OPs	E.3 Introduce education programs within companies to provide RPs and GPs insight into occupational health aspects	U	↑	↑	U
OP–RP-communication	OPs	P.4 Establishing lasting cooperation between OPs/employers and selected rehabilitation institutions	U	↑	U	U
	Employers	O.1 Have HR departments send the OP contact details or work place description by default	U	↑	↑	U
	OPs	E.1 Encourage OPs to file applications more often to increase their visibility	U	↑	U	U
Cooperation with OPs in general	OPs	E.4 OPs should focus more on informing and educating GPs/RPs/patients better about OPs' role and functions	U	↑	↑	↑
	Prof. organizations	E.5 Professional associations should focus on informing and educating GPs/RPs/patients better about OPs' role and functions	U	↑	U	U

↓, rejected; ↑, supported/suggested; U, attitude unclear; M, mixed responses. Categories of the suggestions: E, Education and Information; R, Regulation; F, Financing; T, technical and technological salutations; P, promoting cooperation; interviewees: GP, general practitioners; OPs, occupational health physicians; RPs, rehabilitation physicians; Rehab, rehabilitation patients

(O.1) to have the companies' HR-departments send (O.1a) the OP's contact details or a workplace description (O.1b) to the OP to the patient's rehabilitation clinics by default, as soon as this department was informed about the patient's rehabilitation treatment. It was argued that this was only feasible in sufficiently large companies and RPs in both focus groups were hesitant about the provision of a workplace description by default, as they felt sufficiently able to assess the patient's workplace in most cases and were concerned about being flooded with unnecessary information.

### Interfaces at the end of rehabilitation treatment

At the end of rehabilitation, RPs provide GPs and other physicians treating the rehabilitant with a short discharge letter, as well as with a more detailed and longer rehabilitation report, which should be sent to the treating physicians within 14 days.

All participants advocated for improvements regarding this informational interface. (R.2) GPs, OPs, and RPs supported shortening the rehabilitation report, which would make changes in regards to the regulation of the funding agencies necessary. In their view this would reduce the time needed to write the report, lead to a faster delivery and could reduce information loss at the interface, as such as shorter reports are more likely to be read. Some RPs rejected this suggestion, as condensing the information might take even longer than writing a longer report and as the comprehensiveness of the report could be beneficial

and timesaving for other physicians, as they could rely on the extensive medical history recorded in the rehabilitation clinic.

Some RPs suggested that (R.3) the rehabilitation report should be divided into sections, which could be combined based on the informational needs of the respective recipients. Such a letter would be shorter, have a higher information density and would more likely be read, and could overcome the barrier of patients' and physicians' concerns about data privacy, as no unnecessary personal information would be passed on. RPs stated that through a recombined rehabilitation report, it would be possible to pass on segments, e.g. relevant for occupational reintegration without providing personal or sensitive information (e.g. about the patient's mental health), which otherwise could decrease the acceptability of providing the respective medical stakeholder with any information. OPs and GPs both stated they only needed parts of report in order to fulfill their function.

(R.4) Some OPs proposed that the rehabilitation report should be sent to OPs by default (R.5) or to change the default status of OPs as recipients of the rehabilitation report from an opt-in to and opt-out status: instead of actively adding the OP as a recipient, OPs should receive the rehabilitation report by default unless this is actively rejected by the patient. A number of GPs and RPs rejected these proposals. Some RPs even questioned whether OPs should receive the rehabilitation report at all. Even sending a shortened version of the report by default was rejected by some RPs.

## Interventions after the rehabilitation treatment

In the German health care system GPs work on a budget which limits the amount of diagnostic procedures and treatments that they can prescribe. GPs in our interviews argued that the treatment recommendations by the RPs posed a substantial financial burden on their budget and had led to conflicts with patients. GPs therefore suggested that the (F.3) post-rehabilitation treatment (e.g. physical therapy) should be paid via the rehabilitation institutions by their funding agencies, for example through a “voucher booklet” given to the patients by the rehabilitation clinic. Of note, consolidative programs following medical rehabilitation (i.e. functional trainings) are already reimbursed by the Pension Insurance. RPs acknowledged that financial and legal limitations constrained GPs during post-rehabilitation therapy, but argued that some of these issues could be solved through direct communication between GPs and RPs.

RPs, GPs, and OPs alike stated that an improved evaluation of the rehabilitation process would be desirable. Some RPs were more reserved, stating that an evaluation by GPs was not feasible due to time limitations and that the feedback would not have an impact, as this feedback would not change the working routine in the rehabilitation institutions. RPs suggested (O.3) introducing a feedback system based on questionnaires sent to patients or GPs by the rehabilitation clinic 6 months after discharge. Other GPs and RPs preferred a (R.6) structured follow-up program, which should include a medical consultation and examination by the GPs, rather than just a questionnaire survey. GPs pointed out that an evaluation system to be used by GPs already existed, but was rarely used in practice, i.e. due to time limitations and due to GPs forgetting about sending an evaluation. Participants in GP and RP FGDs suggested to have RPs (O.4) send the GPs a reminder at the respective deadline. GPs supported an active role of RPs in the evaluation process. OPs stated that they could play a role in the evaluation and feedback processes as well, e.g. (R.7) through a post-discharge check-ups.

OPs in our interviews suggested that (P.3) RPs should have to reach out to OPs in cases when the patient’s job was at risk, e.g. due to health-related restrictions which would affect the patient’s professional activities. RPs also should discuss possible consequences of the formal assessment of the patient’s ability to work could have for the patient (e.g. the risk of losing the job due to health restrictions). According to OPs, patients often were not aware of these consequences and these were not sufficiently addressed by the RPs.

A number of OPs argued that (R.8) including OPs in the return-to-work process should be made obligatory, which was disputed by other OPs. Another suggestion focused on strengthening the OPs’ role in the

return-to-work process through the employer: (O.5) Employers could make the approval of the RPs’ proposals for a return-to-work dependent on the OPs’ decision. This would lead to RPs having to contact OPs on a regular basis. The OP who suggested this had such an arrangement with her employer, which led to her being involved in the occupational reintegration of her patients in nearly all instances.

A differing understanding of terms related to patient’s ability to work (e.g. the term *piecework*, or *Akkordarbeit* in German) was considered a problem by RPs and OPs. Some OPs suggested (O.6) introducing a common language by developing joint definitions, while another OP suggested (T.1) developing a discharge letter which included a predefined list of terms relating to the patients’ ability to work. By using this tool, RPs could clearly communicate their assessment on which tasks patients were no longer able to perform.

## Suggestions for improving the rehabilitation process in general

According to some OPs, OPs needed to increase their visibility in order to improve their integration into the rehabilitation process and to build up professional and personal relationships with RPs. To raise RPs’ level of trust and increase the OPs’ visibility, OPs suggested (P.4) establishing lasting cooperation between OPs or employers with selected rehabilitation clinics and to (E.1) encourage OPs to file applications for rehabilitation more often.

A number of OPs supported increasing contact and interaction of RPs and OPs, e.g. through (E.2) joint continuing medical education programs. The concept of joint educational programs was supported in both professional groups. Some OPs also suggested (E.3) education programs within companies to give RPs insight into patients’ work places. Some OPs believed that the lack of cooperation was caused by insufficient knowledge about the OPs’ role, capabilities, and code of confidentiality. According to OPs, educating RPs on the OP’s role and function in the rehabilitation process could overcome this issue. Some OPs proposed that they (E.4) should better explain their position and role to patients and other physicians, while others suggested that (E.5) professional associations should take a stand to strengthen the role of OPs.

(T.2) GPs, RPs, and OPs all supported to increase the use of emails to overcome the barrier of limited time and conflicting schedules through time lags caused by sending letters by post. RPs stated that data privacy regulations currently prohibit the use of email in rehabilitation clinics, but that this could be solved through the introduction of proper encryption software.



## Discussion

The participants in our study proposed suggestions on how problems in the rehabilitation process and barriers to cooperation between OPs, GPs, and RPs could be overcome. These suggestions referred to (1) regulation, (2) financing, (3) organizational procedures, (4) education and information, and (5) promotion of cooperation.

While some of the suggestions are rooted in problems specific to the German health care system, including some suggestions regarding financing or organizational procedures, and may be limited to the German setting or health care systems similar to the German approach, such as Austria or Switzerland. However we believe that they still can be generalized and/or translated to the specific barriers in the cooperation between protagonists in the rehabilitative health care system in other countries.

Recommendations specific to the German health care system include suggestions regarding shortening the rehabilitation report or the use of a standardized communication format in which RPs would communicate the results of their assessment by checking boxes with predefined terms relating to occupational tasks. Two German pilot projects tested similar interventions to improve the communication between stakeholders and found a positive effect. However, both studies were assessed as prone to a high risk of bias (Kuehn et al. 2008; Schwarze et al. 2013). While such tools may be specifically useful for the German rehabilitation system, the barrier of timely transmission of relevant findings and the translation of findings from one specific setting or expert group to another is well known in health services research. Delayed and/or insufficient transfer of information are especially common in the discharge communication between hospital-based to outpatient health care providers (Kripalani et al. 2007a, b; Kattel et al. 2016). It is therefore likely that similar solutions may be useful in the rehabilitation systems in other countries. Although not specifically focused on rehabilitation, the international literature supports structured formats and technology solutions as well as standardized language in order to improve availability, completeness, timeliness, and quality of discharge information from hospitals to out-patient health care providers (Kripalani et al. 2007a, b; Arora et al. 2009; Hesselink et al. 2012; Kattel et al. 2016).

While the suggested interventions regarding finances were identified in a qualitative study on the general cooperation of German OPs and GPs (Mosshammer et al. 2014), they were also reported in two Dutch questionnaire surveys on the role of OPs in the rehabilitation process. In these studies, GPs and RPs suggested increasing remuneration for cooperation with OPs (Buijs et al. 1999;

van Amstel and Buijs 2000). Although financial incentives to improve cooperation between protagonists in the health care system may pose a solution, a Cochrane review with a focus on the quality of care provided by primary care physicians found that there is insufficient evidence regarding the effectiveness or non-effectiveness of financial incentives (Scott et al. 2011).

The proposal of introducing or strengthening evaluation and feedback mechanisms is supported by a Cochrane review by Ivers et al. The review assessed the concept that healthcare professionals may be prompted to modify their practice when given performance feedback showing that their clinical practice is inconsistent with a desirable target. This review found moderate evidence that audit and feedback can lead to small but potentially important improvements in professional practice. However, none of the studies included in this review looked explicitly at the topic of this study, and a transferability of the results to the specific circumstances addressed in this study has yet to be assessed (Ivers et al. 2012).

Some participants stated that OPs needed to better explain their role, function, and the concept of professional confidentiality to their patients. The need for such clarification is supported by two German publications which indicated that the position and function of the OP often was not clear to employees and employers (Glomm 2001; Dzuck et al. 2002). A qualitative study from the Netherlands concluded that patients viewed the cooperation between OPs and curative physicians from a strategic perspective in which their own interests were the key decisive factors (Plomp et al. 2011). If patients could be convinced that OPs were working in their interest, they could be more supportive of interdisciplinary collaboration.

Studies from Germany, the Netherlands, Belgium and Austria also found that RPs (van Amstel and Buijs 2000; Rijkenberg 2012; Mueller et al. 2013) and GPs (Buijs et al. 1999; Mosshammer et al. 2012) who are unaware of the OP's functions could pose a barrier to cooperation. A number of studies (i.a. from the Netherlands) have also reported mistrust of OPs among GPs (Buijs et al. 1999; Nauta and von Grumbkow 2001; Pfaff et al. 2009; Mosshammer et al. 2011) and RPs (van Amstel and Buijs 2000; Vroeijsstijn-Nguyen and Brenner 2007) in Germany and the Netherlands regarding, for example, conflicts of interest or adherence to confidentiality regulations. Buijs et al. already concluded in 1999 that OPs must clarify their position to GP colleagues to overcome obstacles to cooperation (Buijs et al. 1999). This is supported by two Dutch surveys among RPs and GPs concluding that if OPs could clarify how they were going to use the patient's data and that they were working in the interest of patients, this could reduce concerns about cooperation (van Amstel and Buijs 2000; Buijs et al. 2009).

Our participants suggested introducing joint continuing medical education programs to strengthen and facilitate interdisciplinary communication and to build interdisciplinary relationships. Similar proposals have also been made in German qualitative studies on interfaces in the rehabilitation process (Pohontsch and Deck 2011) and cooperation between GPs and OPs in general (Mosshammer et al. 2014). Nauta et al. tested in a Dutch setting whether a joint vocational training program would improve cooperation and trust between junior doctors training to become GPs and OPs. They found that junior GPs' trust increased after the program and that it helped them to overcome prejudices against OPs. However, this effect concerning the junior GPs' trust disappeared after 3 months (Nauta et al. 2006). In another Dutch study, a training program did not lead to an increased collaboration between GPs and OPs on lower back pain (Faber et al. 2005). A Cochrane review of the international literature on interprofessional education programs found weak evidence that such programs can have slightly positive effects on cooperation between physicians and other health professionals (Reeves et al. 2013). However, the transferability of the results on collaboration between physicians of different disciplines is unclear. An interest in joint professional training programs was voiced in two surveys by a majority of OPs and RPs from Belgium, Austria, and the Netherlands (Vroeijenstijn-Nguyen and Brenner 2007; Rijkenberg 2012). By contrast, in a qualitative study from Germany a majority of GPs rejected the proposal of joint quality circles with OPs (Mosshammer et al. 2014). The suggested exposure of RPs to the patients' workplaces has been found to have a strong evidence basis regarding the reduction of work disability duration (Franche et al. 2005).

In a study conducted within the same research project as this study, we assess the role of intergroup dynamics in general as well as the role of negative or stereotypical group perceptions in particular as a barrier to cooperation, based on the Social Identity Approach by Tajfel and Turner (1979, 1986). Based on this theoretical approach, the study identified numerous divergent perceptions (i.e. regarding roles, responsibilities and capabilities) among the specialist groups, as well as negative perceptions, especially about OPs. Both, divergent and negative perceptions are linked to barriers to cooperation. Based on this theory-driven assessment, we propose solutions for resolving conflicts in intergroup dynamics building on approaches, which themselves are based on or are linked to the Social identity approach, i.e. the model to resolve intractable identity-based conflicts (IIC) or the contact hypothesis (Stratil et al. submission in process).

Some of the suggestions proposed by participants seem to indicate a heterogeneous level of knowledge regarding rehabilitation services. For example statements of GPs

suggesting an unawareness of existing evaluation schemes or the financing of consolidative post-rehabilitation programs or of one RP admitting to be unaware of the role of OPs in the rehabilitation system. While not explicitly stated by participants, overcoming a lacking knowledge on processes in the rehabilitation system could pose a possible solution. A systematic assessment of informational needs offers a promising field for future research.

Our study has several strengths. We were able to achieve high levels of heterogeneity in our sample of interviewees, e.g. regarding work experience of the different physicians and the disease profile of rehabilitants. Moreover, we included patients as main stakeholders. They made only few suggestions in regards to improving the cooperation, and mostly discussed barriers to cooperation and problems they had experienced during their treatment. As most suggestions proposed by the physicians focused on problems experienced by patients as well, we believe the suggestions to work in their interest. A limitation of the study is that the composition of our focus groups deviated from the composition specified in our protocol (Voelter-Mahlknecht et al. 2017), especially concerning the number of OPs among the participants and their working profile. We believe the perception of different roles of OPs is still represented in our sample, as some OPs had worked as employees of occupational service providers and as staff doctors in the past. As a strong heterogeneity of rehabilitation clinics in regards to OP–RP-cooperation has been indicated by some studies, we cannot exclude the possibility of a bias in the RPs and rehabilitants perception due to unwanted group effects. As participants were aware that the interviews were conducted by occupational health experts, biased responses due to social desirability are possible, but we believe this risk can be considered low due to the richness of our data and the critical statement made in the discussions. We conducted FGDs with homogenous professional groups in order to have participants discuss less constrained and to allow them talk more freely about negative or possibly prejudicial attitudes regarding the other medical specialists or patients. As numerous critical statements were made by participants about other groups of participants, we consider the FGDs with heterogeneous participants of a homogenous professional group to be successful. Interprofessional discussion took place within the validation workshop held in January 2015 where OPs and GPs participated. We will consider conducting FGDs with mixed professional groups based on the finding of this study, if new resources can be acquired.

In this study, we present suggestions to overcome problems and improve collaboration at the interprofessional interfaces of the rehabilitation process in Germany which in part may be transferred to other countries, too. This study builds on an

earlier publication that has outlined possible obstacles to cooperation in terms of organizational, interpersonal, and structural barriers. We suggest that stakeholders focus on organizational procedures, education and information interventions, and on the promotion of cooperation, as these interventions may be implemented by the stakeholders themselves in their everyday working routine. Changing aspects of finance and regulation may be more effective although more complicated to establish and therefore more suitable as long term solutions.

Based on the literature, the qualitative study on barriers to cooperation and the results of this qualitative study on possible solutions, we believe a key aspect lies in changing the perception of and knowledge about the role and function of OPs in general and in the rehabilitation process in particular.

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#### Compliance with ethical standards

**Ethical approval** The ethics committee of the Faculty of Medicine at the University of Tübingen approved the study protocol. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

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**Conflict of interest** The authors declare that they have no conflict of interest.

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## **4 Discussion**

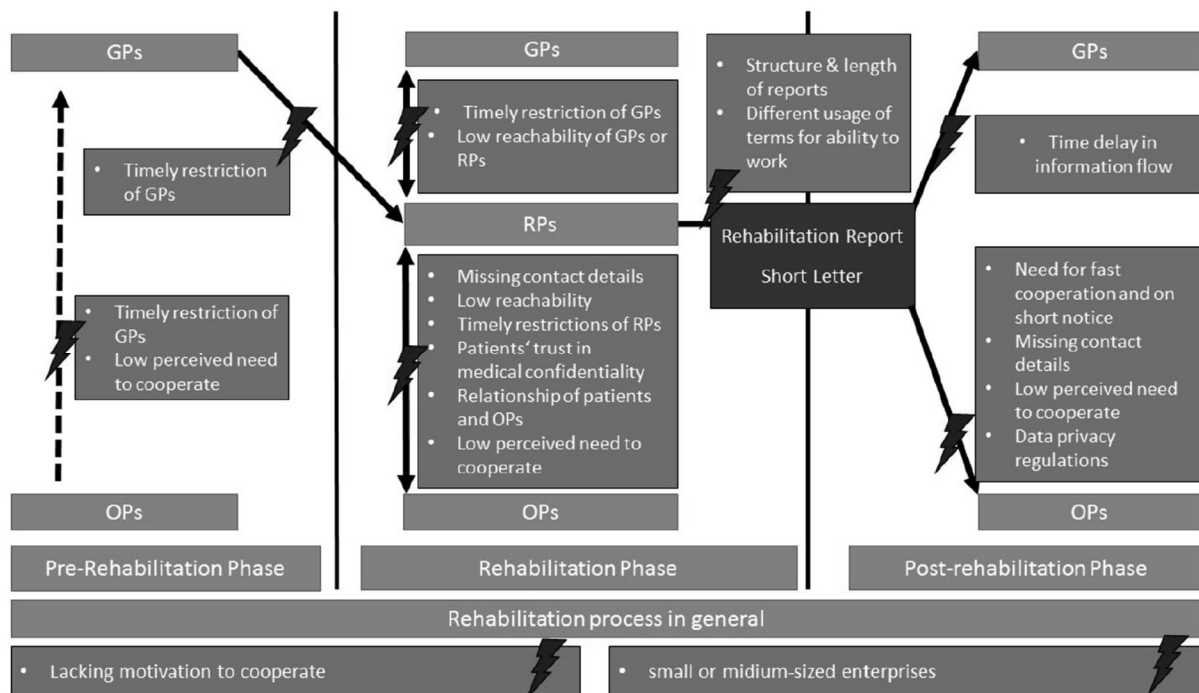
This dissertation project consists of three publications published in internal peer-reviewed journals. The first publication [4] is the study protocol which describes in depth the methodological approach chosen, while the two following publications [5, 6] outline the results of the qualitative study.

The study was conducted against the background of a sustained expression of support for improved cooperation [34-37, 39, 58, 90], and the possible benefits of a well-functioning and/or improved cooperation with OPs in the rehabilitation process on the one side [11, 12, 28, 31, 32, 42, 45] and the persisting structural exclusion of OPs from the rehabilitation process on the other [1, 2]. In order to explore this perceived discrepancy this qualitative study used the transcripts of Focus Group Discussions with Occupational health Physicians (OPs), Rehabilitation Physicians (RPs) and General Practitioners (GPs), as well as rehabilitation patients. The study used qualitative content analysis to explore experiences, opinions and attitudes of the participants in order to describe barriers as well as opportunities for improvement concerning the intersection between the medical protagonists located in the health care services sector at the intersections around workplace and rehabilitation institutions [4-6].

### **4.1 State of cooperation and perceived barriers: Summary of findings**

In this segment I will primarily focus on publication two on the barriers and obstacles in the communication and cooperation [6]. It is primarily based on the discussion section of the respective publication [6].

The participants in this study experienced and perceived the cooperation and communication between GPs, RPs, and OPs in the rehabilitation process as not working smoothly. Especially OPs expressed a perceived exclusion from the process [6]. OPs, RPs, GPs, and rehabilitation patients discussed several obstacles to cooperation, which were categorized as (1) organizational, (2) interpersonal, and (3) structural barriers by the author [6]. Figure 2 in the publication Stratil 2017a[6] provides an overview over the barriers and obstacles as reported by the participants in the study (Fig. 2) [6].



**Fig. 2** Barriers to and obstacles in cooperation and communication at the interfaces in the rehabilitation process as reported by GPs, RPs, OPs, or rehabilitation patients[6]. Figure is extracted from publication Stratil 2017a[6].

“The identified organizational barriers as reported by the participants included: Missing contact details of OPs, low reachability of RPs, OPs, and GPs, time restrictions of RPs and GPs, and problems caused by the RPs’ need for fast coordination with OPs on short notice [5]”. “In regards to interpersonal barriers, patients as well as physicians reported that low levels of trust and poor relations between employees and OPs might pose barrier, as patients have to agree to OPs being included in the rehabilitation process and being provided with patient data. Furthermore, patients and physicians have expressed concerns that OPs might not follow confidentiality regulations and might have conflicts of interest due to their relationship with the employer. Other identified interpersonal barriers included: lacking initiative or interest in communication by RPs, OPs, or GPs and a low perceived need to cooperate with OPs. For example, while OPs perceived a third-party workplace description as important for successful rehabilitations, RPs felt they were able to sufficiently assess the patients’ workplaces, believed the integration of OPs into the occupational reintegration process as rarely necessary, and considered OPs to be optional recipients of the rehabilitation report” [5].

Structural barriers reported by the participants included privacy regulations, the structure and length of the rehabilitation report, differing assessment methods of the patient's working ability, as well as the context of occupational health care services in Small and Medium-sized Enterprises (SMEs)[6].

#### **4.2 State of cooperation and perceived barriers: Discussion of results**

While the nature of the methodological approach used in this study does not allow conclusions in regards to the representativeness or generalizability of issues highlighted by the participants, the findings in this study are in line with other qualitative and quantitative studies conducted in Germany and other countries in Western Europe [1, 2, 6, 57-59, 90, 91].

The general notions of reported low levels of integration of OPs in the rehabilitation process are in accordance with a number of German publications including quantitative cross sectional studies [1, 2, 6, 52, 60-62].

The organizational barrier of insufficient time as well as the barrier regarding the reachability of essential communication partners were reported by OPs and RPs in surveys conducted in Austria, Belgium and, the Netherlands [58, 59, 90], as well as in the cooperation between OPs and GPs [63, 65] and other medical specialists [90].

The barrier of rehabilitation patients withholding the approval for their RP to contact the OP was mentioned in the FGDs with rehabilitation patients, RPs and OPs. This finding is supported by a small survey of German rehabilitation patients [62] and a survey of RPs conducted in Austria and Belgium [90]. Both publications report the withholding of approval by a considerable number of patients.

As an interpersonal barrier several participants of the FGDs (especially OPs) report on the perceived problem of RPs and GPs being unaware of the OPs' role and function in the rehabilitation process. This is supported by surveys conducted in Austria [90], Belgium [90], Germany [52, 64] and the Netherlands [58] as well as a Focus Group Discussion conducted in Germany [63], which directly or indirectly report on similar issues.



The second interpersonal barrier in regards to trust – medical specialists mistrusting OPs – can also be found in various studies. Similar experiences were mentioned in the comment section of a survey conducted among OPs in Germany [60, 61]. GPs' mistrust of OPs was mentioned in studies from Germany [22, 63-65], the Netherlands [36, 58, 90], Belgium [90], and the UK [92]. The primary concern was an expressed doubt whether OPs were working in the interest of the employer rather than the employee. Two surveys from the Netherlands report on similar perceptions about OPs among RPs [58, 59].

#### **4.3 Opportunities and options to optimize cooperation: Summary of findings**

Beside the discussion of barriers and obstacles which might hamper cooperation and communication between the participants, the study was also focused on ways to improve the cooperation [5]. This is mainly the focus of the second results publication. The following section builds mainly on the passages in the discussion section of said publication [5].

These suggestions of OPs, GPs, RPs and rehabilitation patients on how to improve cooperation and communication were categorized into the following categories: 1) regulation (e.g. formalized role and obligatory input of occupational physicians), (2) finance (e.g. financial incentives for physicians based on the quality of the application), (3) technology (e.g. communication by E-Mail), (4) organizational procedures (e.g. provision of workplace descriptions to RPs on a routine basis), (5) education and information (e.g. joint educational programs, measures to improve the image of OPs), and (6) promotion of cooperation (e.g. between OPs and GPs in regards to the application process) [5]. These suggestions are discussed in the publication Stratil 2017 [5]. The following table is based on Table 3 of said publication and is meant to give an overview of suggestions brought forward; they are described in more detail in the results section [5].

**Table 1 Suggestions for improving cooperation based on statements made by the participants in the FGDs [5].** Table based on Table 3 in publication by Stratil et al 2017[5]. “Abbreviations: interviewees: GP = general practitioners, OPs = occupational health physicians, RPs = rehabilitation physicians, Rehab = rehabilitation patients”[5]

Category	Intervention
promotion of cooperation	P.1 Promote cooperation between OPs and GPs on application: OPs could add assessment to GPs application
	P.2 OPs could write objection to rejected applications
	P.3 Promote RPs reaching out to OPs if continued employment of patient is at risk
	P.4 Establishing lasting cooperation between OPs/employers and selected rehabilitation institutions
Financing	F.1 Remuneration of doctors for filing rehabilitation applications should be increased
	F.2 A conditional financial incentive for application forms containing all necessary information should be introduced
	F.3 Organize financing of post-rehabilitation treatment through the rehabilitation institutions (e.g. through voucher booklets)
Regulation	R.1 Funding agencies should make an OP's contribution to application form (e.g. statement (R.1)/work place description (R.2) an obligatory prerequisite for acceptance of application
	R.2 Funding agencies should introduce regulations in order to shorten the rehabilitation report
	R.3 Funding agencies should introduce regulations to allow a division of the rehabilitation report into segments and have recombined and tailored reports send to recipients (e.g. OPs)
	R.4 OPs should be obligatory recipients of the rehabilitation report
	R.5 The default status of OPs as recipient should be introduced, instead of an explicit opt-in decision of patients/RPs
	R.6 To improve evaluation of the rehabilitation, a structured follow-up program including medical consultation and examination e.g. by a GP should be introduced
	R.7 A structured post-discharge check-up conducted by OPs should be introduced (e.g. by the funding agencies)
	R.8 Have OPs contribution to occupational reintegration made obligatory (e.g. by the funding agency)
	R.9
Organi- zational procedures	O.1 Have HR departments send the OP contact details or work place description by default
	O.2 Introduce an evaluation system based on rehabilitation clinics sending questionnaires to GPs 6 month after rehabilitation
	O.3 Have rehabilitation institutions send a reminder to GPs to evaluate the results of rehabilitation
	O.4 OPs could make an arrangement with the employer, to have the employers' acceptance of the RPs' proposal for occupational reintegration to depend on the OPs assessment.
	O.5 OPs, RPs, and GPs should develop a joint definition or understanding of terms e.g. regarding the patient's ability to work

Technical and technological salutations	T.1	A revised discharge letter with predefined terms relating to the patient's ability to work should be introduced (e.g. by the DRV)
	T.2	Increase the use of E-mails in the communication between OPs, GPs, and RPs (e.g. by introducing appropriate software)
Category	Intervention	
Education and information	E.1	Encourage OPs to file applications more often to increase their visibility
	E.2	Introduce / increase joint continuing medical education programs between RPs, OPs, and GPs
	E.3	Introduce education programs within companies to provide RPs and GPs insight into occupational health aspects
	E.4	OPs should focus more on informing and educating GPs / RPs / patients better about OPs' role and functions
	E.5	Professional associations should focus on informing and educating GPs / RPs / patients better about OPs' role and functions

“Some of the suggestions are rooted in problems specific to the German health care system, including some suggestions regarding financing or organizational procedures, and may [therefore] be limited to the German setting or health care systems similar to the German approach, such as Austria or Switzerland. However I believe that they still can be generalized and/or translated to the specific barriers in the cooperation between protagonists in the rehabilitative health care system in other countries” [5].

“Recommendations specific to the German health care system include suggestions regarding shortening the rehabilitation report or the use of a standardized communication format in which RPs would communicate the results of their assessment by checking boxes with predefined terms relating to occupational tasks” [5]. Two German pilot projects [49, 50, 54] tested similar interventions to improve the communication between OPs and RPs found a positive effect in regards to occupational health outcomes [54] or process parameters and perceived benefits [49]. However, as one study was a controlled before-and-after study and the other an uncontrolled before-and-after study and both studies had major risks of bias, the effectiveness of this way to improve cooperation remains unclear.

The barrier of delayed transmission of relevant findings as well as the translation of such findings from one specific setting or expert group to another is a well-known problem in health services research and translation research in general. Delayed and/or insufficient transfers of knowledge and information are especially

common in the discharge communication between hospital-based and outpatient service providers (such as general practitioners) [5, 93-95]. “Although not specifically focused on rehabilitation, the international literature supports structured formats and technology solutions as well as standardized language in order to improve availability, completeness, timeliness, and quality of discharge information from hospitals to out-patient health care providers [5, 93-97]” [5]. These solutions are similar to those suggested by the participants in this study [5].

While the suggested interventions regarding finances were identified in a qualitative study on the general cooperation of German OPs and GPs [98], they were also reported in two Dutch questionnaire surveys on the role of OPs in the rehabilitation process. In these studies, GPs and RPs suggested increasing remuneration for cooperation with OPs [36, 58]. Although financial incentives to improve cooperation between protagonists in the health care system may pose a solution, a Cochrane review with a focus on the quality of care provided by primary care physicians found that there is insufficient evidence regarding the effectiveness or non-effectiveness of financial incentives [99].

The proposal put forward by the participants of the Focus Groups of introducing or strengthening inter-professional evaluation and feedback mechanisms is supported by a Cochrane systematic review by Ivers et al [100]. This systematic review assessed the concept of healthcare professionals being prompted to modify their professional practice when given feedback on their performance and being shown that their clinical practice is not in line with a desirable outcome target or best practice. The authors found moderate evidence for the effectiveness of audit and feedback mechanisms in regards to achieving small but potentially important improvements in the professional practice of those receiving feedback [100]. However, none of the studies included in the systematic review focused explicitly on rehabilitation and the much shorter time frames and more direct forms in which the feedback was given in the studies included in the review was quite different from what can be assumed will be the case for the suggestions brought forward in this study [100]. Therefore: while the suggestion of improving evaluation and feedback loops through various mechanisms seems to have the potential to improve practice in regards to rehabilitative treatment, this has yet to be tested and proven for the given context [5].

In this study especially participants who work as OPs stated that in order to improve cooperation, OPs and their professional representation bodies needed to better explain the role and function of OPs, as well as the concept of professional confidentiality to patients and members of other medical specializations [5]. The need for such clarification builds on the perceived barriers reported in the second publication (Stratil 2017a [5]) and is supported by several other studies.

In regards to patients, two German publications (an opinion paper and a survey) state that the position and professional function of the OP in general and in the rehabilitation process in particular often was not clear to employees and employers [101, 102]. The case of patients mistrusting their OP (and the potential of this being a barrier in the rehabilitation process as a result) is supported by surveys of rehabilitation patients in Germany [62] and the Netherlands [103] as well as RPs [58, 90] or OPs [60, 61] talking about the perceived attitude of their patients. A qualitative study conducted in the Netherlands came to the conclusion that patients viewed the cooperation between OPs and curative physicians in other fields from a strategic perspective with their own interests being the key decisive factor [104]. All these aspects underline the suggestion put forward in this study, that informing patients and thereby convincing them that the OPs are working in their interest, could improve the cooperation between OPs and other medical specialists[5]. But at this point, no interventional study has assessed this hypothesis in an experimental or real-world setting.

In regards to medical professionals, the suggestion to improve awareness about the OPs function, role and professional conduct is supported by the studies which found or stated that a proportion of RPs [52, 58, 59, 90] or GPs [36, 63, 65] were unaware of the OPs function. Several studies have also reported the mistrust of OPs among GPs [22, 36, 65, 92] and RPs [58, 59, 90] in Germany and the Netherlands. For example regarding the management of conflicts of interest or the adherence to confidentiality regulations in regards to the employer. The suggestion that OPs must clarify their position to the professional colleagues working as GP to overcome obstacles to cooperation was already stated by Bujis et al in an opinion paper in 1999 [36]. A similar statement was made in a Dutch survey, in which RPs stated that if OPs could clarify how they

were going to use the confidential patient data and show that they were working in the interest of patients rather than the employer, this would enhance the willingness of the RPs to cooperate and communicate with OPs [58]. But I am not aware of any publication which tested the effects of improved knowledge about the OPs practice among RPs and OPs (beside the intervention by Nauta et al which will be discussed in the next passage).

As a means to raise awareness and strengthen trust – but also independent from these aims – the participants in this qualitative study suggested introducing joint continuing medical education programs, which may strengthen and facilitate interdisciplinary communication and build interdisciplinary relationships [5]. Similar suggestions have been made in German qualitative studies including OPs, RPs, and GPs which addressed the rehabilitation process [105] or the cooperation between GPs and OPs in general [63, 98]. An interest in joint professional training programs was voiced in by a majority of OPs and RPs in two surveys conducted in Austria, Belgium, and the Netherlands [59, 90]. By contrast, a majority of GPs participating in a non-representative qualitative study from Germany rejected the proposal of joint quality circles with OPs [98].

A Cochrane review which assessed the international literature on inter-professional education programs found weak evidence for the effectiveness of such programs to have slightly positive effects on cooperation between physicians and other health professionals (such as the nursing staff) [106]. However, the transferability of these findings of the inter-professional collaboration to the inter-disciplinary collaboration between physicians of different specializations remains unclear.

The Dutch researchers Nauta et al. tested the effects of an improved joint vocational training program focusing on the outcomes of willingness to cooperate and levels of trust among junior doctors training to become GPs and those training to become OPs. In their study they found that junior GPs' trust increased directly after the program and that it helped the junior GPs to overcome prejudices against OPs. However, these positive effects of GPs' trust were not long lasting and disappeared after 3 months [92]. Another study conducted in the Netherlands assessed the impact of a joint training program and whether it lead to an increased collaboration between GPs and OPs on patients suffering from lower back pain. The researchers report that there was little collaboration

between physicians during the project and that the patients in the intervention region returned to work significantly later. No differences were found between the intervention and control patients for endpoint outcome measures such as pain, disability, quality of life, and medical consumption [107].

The suggestion of OPs to increase exposure of RPs to the patients' workplaces, for example through continuing medical education programs, was assessed in several studies and systematic reviews. There is a moderate to strong evidence for the effectiveness of an increased exposure of rehabilitation physicians to the patients workplace [31, 108], although none of the included studies were conducted in Germany and a transferability of the findings to the specifics of our health care system has yet to be tested.

#### **4.4 Strengths and Limitation**

This study has several strengths and weaknesses.

In regards to the participants in the Focus Group Discussions we strived to attain maximal structural heterogeneity in order to reflect the diversity of ideas and perceptions within the populations of interest [4]. We were able to achieve this goal in the sample of participants in the FGDs with GPs, RPs and rehabilitants. For example in regards to: the gender distribution, working experience among RPs and GPs or disease profiles of the rehabilitation patients [5, 6].

Moreover, the study not only included physicians, but also rehabilitation patients which were involved and questioned main stakeholders [5, 6]. The aim to have the patient and the patients' interests at the center of a research project is a particular focus in health services research [109, 110].

Furthermore I applied high methodological rigor in the research project, for example by providing and publishing a study protocol [4], by having every step of the coding of the transcripts done by at least two independent persons [86, 111] or reporting all details according to an international accepted reporting guideline [5, 6, 89]. In addition, the three published components of this research were assessed and approved by seven international researchers working in the field of health services, occupational health and/or rehabilitation research in three different peer review processes.

A limitation of the study is that the actual composition of the Focus Group participants deviates from the planned composition laid out in the study protocol [4]. This concerns especially the group of OPs, as the recruitment of OPs had turned out to be more complicated than expected. Several OPs on the list used for recruitment could not be reached after several attempts, had already retired or died, or declined to participate – especially because of time constraints. While the intention of this study is not to be representative, I believe there might be a risk of bias due to voices not included in the discussion, for example through a selection bias of OPs with a strong interest in the topic.

The the FGD with patients the discussion mostly focused on barriers to cooperation and problems they had personally experienced during their treatment. While this provided important contributions to the discussion on barriers to cooperation and complemented the accounts of the other groups of participants [6], they only provided few suggestions in regards to improving the cooperation between the main medical stakeholders. But as most suggestion proposed by other participants are intended to overcome problems experienced and reported by these patients, I believe the suggestions in many cases are not contradictory to their interest [4-6].

According to the participants in this study [5, 6] and some studies [58, 60, 61], there is a heterogeneity among rehabilitation clinics in regards to their quality and the willingness of their clinical staff to participate with OPs. As the RPs and rehabilitation patients were recruited from the same two clinics with an affiliation to rehabilitation research, unwanted group effects in the responses cannot be precluded, despite the heterogeneity in the profile of RP participants [4-6].

Although not previously intended [4], the moderators in the Focus Group Discussion were occupational health experts and the participants were aware of the occupational focus of the institute this research project was conducted in. Therefore, biased responses due to social desirability are possible. But I believe this risk for this to be low, considering the richness of the data and the critical statements about OPs made in the discussions in all Focus Groups [4-6].

The FGDs were conducted with homogenous professional groups in order to create an open environment, to have participants discuss less constrained by social desirability and to allow them talk more freely about negative or possibly



prejudicial attitudes regarding the other medical specialists or rehabilitation patients. As numerous critical and partially prejudicial statements were made by participants in most FGDs about members of other professional groups, the composition of FGDs with heterogeneous participants of homogenous professional groups can be regarded as a success. But a limitation of this study is that no inter-professional Focus Group was conducted in addition to the FGDs with homogenous professional groups. An inter-professional discussion took place at the validation workshop with OPs and GPs (but no RPs) participating. This limitation was a consequence of the limited funds available in this research project [4-6].

Owing to the same resource and time constraints, this study was not able to include the opinion of other stakeholders who are directly or indirectly involved in rehabilitation process (e.g. relatives of patients, representatives of funding agencies) [4-6].

While not a limitation of this study in a strict sense, a characteristic of qualitative research in general is that the results are not statistically generalizable or representative for the assessed population as a whole. Future quantitative research – building on representative samples – is required to evaluate the relative weight of the problems, barriers and suggestions reported by the participants. Interventional studies of high quality and with sensitivity to the specific context in Germany are needed to assess the effectiveness of interventions put forward by the participants [4-6].

#### **4.5 Summary and Outlook**

This study provides an overview of barriers to and obstacles in the cooperation and communication perceived by German GPs, RPs, OPs, and rehabilitation patients, as well as suggestions to overcome problems and improve collaboration at the inter-professional interfaces of the rehabilitation process in Germany – which in part may be transferable to other health care settings, too [5, 6].

The main problem areas identified related to organizational, interpersonal, and structural barriers. As discussed, the findings generally align with the results of other studies or expert opinions from Germany and other European countries [6]. Based on these experienced and perceived barriers or / and problems in the

rehabilitation process, the participants suggest numerous approaches to improve communication and cooperation between the participants and especially to enhance the inclusion of OPs in the rehabilitation process. These suggestions relate to the following categories: (1) regulation, (2) financing, (3) organizational procedures, (4) education and information, (5) promotion of cooperation and (6) technical and technological solutions.

“Some of the barriers could be overcome by the protagonists themselves or by regional cooperation in the current milieu. Other barriers will require interventions in the areas of finance, data regulation, and the rehabilitation report requirements” [6]. Therefore, it seems that ongoing interventions on various levels and by multiple different stakeholders – including state and federal actors – might be necessary to achieve lasting changes [6].

One approach to improve cooperation and communication is to focus on the organizational and interpersonal barriers, as these might be easier to overcome by the stakeholders themselves in the practice of their everyday routine. This includes a focus of the stakeholders on organizational procedures, education and information interventions, and on the promotion of cooperation. A pressing issue seems to be the need of OPs to foster trust among employees, GPs and RPs and to raise awareness about the mutual benefits of strengthening cooperation. While applicable in the daily working routine, the evidence of effectiveness for the suggestions made by the participants is still limited and need to be assessed in a structured and rigorous manner [5, 6].

Changing aspects of finance and regulation as a system-level intervention may be more effective in the long run, although more complicated to establish and therefore more suitable as long term solution achievable through political engagement. While the evidence of effectiveness from the international literature seem promising, convincing interventional studies of high quality conducted in the German health care setting are still missing as well [5, 6].

Future quantitative and interventional studies are needed to supplement and advance the findings of this exploratory qualitative study.

## 5 Abstract

**Introduction:** Rehabilitation measures for patients in the working age primarily aim at maintaining employability, restoring fitness for work and timely return to work. General practitioners (GPs), occupational health physicians (OPs), and rehabilitation physicians (RPs) fulfill different functions in the rehabilitation process, which need to be interlinked effectively to achieve a successful medical and occupational rehabilitation. In Germany, this cooperation at the interfaces is regarded as often working suboptimal.

On this background, this qualitative study had two main aims: the first was to record the experiences and attitudes of OPs, RPs and GPs, as well as of rehabilitation patients, to indicate barriers to and obstacles in the cooperation and communication between medical professionals at the intersection of workplace and rehabilitation institutions. The second aim of the publication was to identify, present and discuss suggestions proposed by physicians and patients on how these barriers and obstacles can be overcome and thereby how communication and cooperation between the medical protagonists may be improved. A special focus of the study was a supposed exclusion of OPs from the rehabilitation process, as reported in the literature.

**Methods and analysis:** As previous literature reviews have shown, insufficient data on the experiences and attitudes of the stakeholders are available. Therefore, an exploratory qualitative approach was chosen. In total, 8 Focus Group Discussions with occupational physicians, rehabilitation physicians, general practitioners and rehabilitation patients (2 Focus Groups with 4–10 interviewees per category) were conducted. Qualitative content analysis was used to analyze the data.

**Results:** A number of barriers to and obstacles in cooperation and communication were reported by the participants, including: (1) organizational (e.g. missing contact details, low reachability, schedule restrictions), (2) interpersonal (e.g. rehabilitants level of trust in OPs, low perceived need to cooperate with OPs, low motivation to cooperate), and (3) structural barriers (e.g. data privacy regulations, regulations concerning rehabilitation reports). In regards to these barriers, options for improvement were identified and characterized by the author in the following categories: (1) regulatory interventions (e.g. formalized role and obligatory input of occupational

physicians), (2) financial interventions (e.g. financial incentives for physicians based on the quality of the application), (3) technological interventions (e.g. communication by E-Mail), (4) changes in organizational procedures (e.g. provision of workplace descriptions to RPs on a routine basis), (5) educational and informational interventions (e.g. joint educational programs, measures to improve the image of OPs), and (6) the promotion of cooperation (e.g. between OPs and GPs in regards to the application process).

**Ethics and dissemination:** The research was undertaken with the approval of the ethics committee of the medical faculty and university hospital of Tübingen. The study participants' gave their written consent prior to participating in the interviews. As set out in the study protocol, the results were published in international, peer-reviewed medical journals.

**Conclusion:** The data on barriers as well as on options for improvements presented in this study are in line with studies and expert opinions from Germany and other countries in Western Europe. While some of the proposed solutions could be implemented by the participants themselves by changing behavior and practice in the everyday routine, a multi-level stakeholder approach might be necessary for implementing others. The evidence for the proposed suggestion is limited and mostly based on studies not conducted in the context of the German health care setting. Future quantitative research is needed to assess the relative weight of the findings and controlled interventional studies are necessary to assess feasibility and effectiveness of the proposed suggestions.

## 5.1 Abstract in German

**Hintergrund:** Rehabilitationsmaßnahmen bei PatientInnen im arbeitsfähigen Alter sind in der Regel auf den Erhalt oder die Wiederherstellung der Arbeitsfähigkeit ausgerichtet sowie auf eine zeitnahe Wiedereingliederung in die Arbeitswelt. In dem dafür notwendigen Rehabilitationsprozess erfüllen AllgemeinmedizinerInnen, ArbeitsmedizinerInnen und RehabilitationsmedizinerInnen unterschiedliche spezialisierte Rollen und Funktionen. Diese müssen effektiv miteinander verknüpft werden, um eine erfolgreiche medizinische Rehabilitation der PatientInnen zu erreichen. Laut aktuellen Übersichtsarbeiten ist in Deutschland die Kooperation und Kommunikation dieser ärztlichen Akteure an dieser Schnittstelle oft suboptimal ausgeprägt.

Vor diesem Hintergrund steht dieses Forschungsprojekt, welches zwei Ziele verfolgt: zum einen sollen die Erfahrungen und Meinungen von AllgemeinmedizinerInnen, ArbeitsmedizinerInnen und RehabilitationsmedizinerInnen sowie PatientInnen daraufhin untersucht werden, welche Barrieren und Hindernisse einer besseren Kooperation und Kommunikation der medizinischen Akteure an den Schnittstellen im Bereich Rehabilitation im Wege stehen. Das zweite Ziel der Studie ist es, auf Basis der Aussagen der TeilnehmerInnen mögliche Lösungsvorschläge zu identifizieren und herauszuarbeiten. Während der allgemeine Fokus auf einer Verbesserung von Kooperation und Kommunikation der medizinischen Akteure an Schnittstellen im Rehabilitationsbereich liegt, legt diese Arbeit einen besonderen Schwerpunkt auf eine in der Literatur beschriebene ausgeprägte Exklusion von ArbeitsmedizinerInnen aus Prozessen im Rehabilitationsbereich.

**Methodik:** Wie Übersichtsarbeiten gezeigt hatten, ist die Datenlage zu Erfahrungen, Einstellungen und Handlungsmotiven der beschriebenen Akteure begrenzt. Vor diesem Hintergrund wurde ein explorativer, qualitativer Ansatz in diesem Projekt gewählt. Zur Datenerhebung wurden 8 Fokusgruppen-diskussionen mit AllgemeinmedizinerInnen, ArbeitsmedizinerInnen und RehabilitationsmedizinerInnen sowie PatientInnen durchgeführt (2 Fokusgruppendifkussionen je Gruppe; je 4 bis 10 TeilnehmerInnen). Die Interviewtranskripte wurden mittels qualitativer Inhaltsanalyse nach Mayring analysiert.

**Ergebnisse:** Basierend auf den Aussagen der TeilnehmerInnen wurden eine Reihe von Hürden und Barrieren für Kooperation und Kommunikation identifiziert, welche sich in folgende Kategorien eingruppiieren lassen: (1) organisationsbezogene Barrieren (z.B. fehlende Kontaktdaten, niedrige Erreichbarkeit, Terminkonflikte),

(2) interpersonelle Barrieren (z.B. fehlendes Vertrauen der Rehabilitanden in den/die Betriebsarzt/ärztin; geringes Gefühl der Notwendigkeit zur Kooperation mit ArbeitsmedizinerInnen, geringes Interesse an Kooperation) und (3) strukturelle Barrieren (z.B. Schweigepflichtrichtlinien, Vorschriften bezüglich Rehabilitationsbericht) [6]. Vor dem Hintergrund dieser erlebten und beschriebenen Barrieren zeigte diese Analyse Handlungsoptionen in folgenden Bereichen auf: (1) regulatorische Interventionen (z.B. Formalisierung der Rolle des/der Arbeitsmediziners/-medizinerin und/oder obligatorischer Input zum Antrag auf Rehabilitation; (2) monetäre Interventionen (z.B. finanzielle Anreize für ÄrztInnen basierend auf der Qualität des Rehabilitationsantrags), (3) technologische Ansätze (z.B. verstärkte Kommunikation per E-Mail), (4) organisatorische Veränderungen (z.B. BetriebsärztInnen übersenden standardmäßig eine Arbeitsplatzbeschreibung an Reha-Kliniken), (5) Fortbildungs- und Informationsinterventionen (z.B. gemeinsame ärztliche Weiterbildungsangebote, Kampagnen zur Steigerung des Images von BetriebsärztInnen unter PatientInnen und innerhalb der Ärzteschaft), und (6) Bewerben von Kooperation (z.B. Bewerben der Kooperation beim Stellen eines Antrags für Rehabilitation).

**Ethik und Dissemination:** Das Forschungsprojekt wurde mit der Genehmigung der Ethikkommission der medizinischen Fakultät der Universität Tübingen und der Universitätsklinik Tübingen durchgeführt. Die TeilnehmerInnen gaben vor der Teilnahme an den Fokusgruppen ihr schriftliches Einverständnis ab. Wie im publizierten Studienprotokoll festgelegt, wurden die Ergebnisse in internationalen Zeitschriften nach durchlaufenem Peer-Review veröffentlicht.

**Schlussfolgerung:** Die Ergebnisse sind sowohl in Bezug auf die Hürden als auch die möglichen Lösungsansätze im Einklang mit Veröffentlichungen aus Deutschland und Westeuropa [5, 6]. Während manche Verbesserungsvorschläge im Arbeitsalltag der ÄrztInnen umgesetzt werden können, wäre bei anderen ein vernetztes Vorgehen auf mehreren Ebenen notwendig. Aktuell ist allerdings die Evidenzlage zur Effektivität der vorgeschlagenen Interventionen, insbesondere für den deutschen Kontext, unbefriedigend. Quantitative Untersuchungen und Interventionsstudien sind notwendig, um – basierend auf den Ergebnissen dieser Studie – möglichen Ansatzpunkten zur Verbesserung von Kommunikation und Kooperation nachzugehen.

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## 7 Declaration of contribution of authors

Die Arbeit wurde am Institut für Arbeitsmedizin, Sozialmedizin und Versorgungsforschung unter Betreuung von Prof. Dr. med. Völter-Mahlknecht durchgeführt.

Die Konzeption des Gesamtprojektes erfolgte durch Frau Prof. Dr. med. Völter-Mahlknecht und Prof. Dr. med. Rieger. Die Konzeption des qualitativen Teilprojekts, der einzelnen Publikation sowie der dazugehörigen theoretischen Fundierung und Analysestrategie erfolgte durch Jan Stratil mit Unterstützung von Prof. Dr. Med. S Völter-Mahlknecht.

Die Durchführung der Analyse der Transkripte mittels der Methodik qualitative Inhaltsanalyse nach Mayring und unter der Verwendung der Software MAXQDA11 (VERBI GmbH, Berlin) erfolgte durch Jan Stratil. Entsprechend den Leitlinien für gute wissenschaftliche Praxis in der qualitativen Forschung arbeiteten die wissenschaftlichen Hilfskräfte René Markovits Hoopi, Maira Schobert, Sigrid Emerich, Stefanie Klein und Natalia Radionova im Rahmen der Duplikation der Kodierung und der Queranalyse mit.

Die Analyse der kodierten Textstellen im Kontext der Forschungsfragen und Literatur erfolgte eigenständig durch mich unter Rücksprache mit Frau Prof. Dr. med. Völter-Mahlknecht. Die Einbettung der Forschungsergebnisse in die aktuelle wissenschaftliche Literatur sowie das Erstellen des Manuskripts erfolgte eigenständig durch Jan Stratil mit Korrektur- und Änderungsvorschlägen durch die Ko-AutorInnen

Ich versichere, die Manuskripte[4-6] selbständig verfasst zu haben und keine weiteren als die von mir angegebenen Quellen verwendet zu haben.

Jan Stratil

München, den 22.01.2018

**Voelter-Mahlknecht 2017: “Study protocol”**

The authors Voelter-Mahlknecht (SVM), **Stratil (JS)**, Kaluscha (RK), Krischak (GK), Rieger (MR) contributed to the publication in the following way:

	SVM	JS	RK	GK	MR
Development of the study design as a whole					
Critical review of the study design as a whole					
Review of literature					
Development of the theoretical background					
Development of research questions for study as a whole					
Development of interview guide					
Development of inclusion & exclusion strategy for participants					
Election and invitation of participants					
Development of strategy for data analysis					
Obtaining approval by the ethics committee					
Drafting the manuscript					
Critical Revision of the manuscript					
Final approval of the version and agreement to be accountable for all aspects of the work					

**Stratil 2017a: “Barriers”**

The authors, **Stratil (JS)**, GK), Rieger (MR) and Voelter-Mahlknecht (SVM) contributed to the publication in the following way:

	JS	MR	SVM
Development of the study design as a whole, theoretical background & research questions for study as a whole			
Review of literature for study design as a whole			
Obtaining approval by the ethics committee			
Preparation of FGDs & conducting FGDs			
Preparation of interview transcripts			
Review of literature; specific for topic of publication			
Development of theoretical background; specific for topic of publication			
Development of strategy for data analysis & research objective specific for publication			
Critical feedback on research objective and development of strategy for data analysis specific for publication			
Development of category system and coding guidelines			
Coding of interview-transcripts			
Cross-analysis of categories in category system			
Critical feedback and discussion during process of data analysis			
Drafting the manuscript			
Critical Revision of the manuscript			
Final approval of the version and agreement to be accountable for all aspects of the work			

Stratil 2017b: "Suggestions"

The authors, **Stratil (JS)**, GK), Rieger (MR) and Voelter-Mahlknecht (SVM) contributed to the publication in the following way:

	JS	MR	SVM
Development of the study design as a whole, theoretical background & research questions for study as a whole			
Review of literature for study design as a whole			
Obtaining approval by the ethics committee			
Preparation of FGDs & conducting FGDs			
Preparation of interview transcripts			
Review of literature; specific for topic of publication			
Development of theoretical background; specific for topic of publication			
Development of strategy for data analysis & research objective specific for publication			
Critical feedback on research objective and development of strategy for data analysis specific for publication			
Development of category system and coding guidelines			
Coding of interview-transcripts			
Cross-analysis of categories in category system			
Critical feedback and discussion during process of data analysis			
Drafting the manuscript			
Critical Revision of the manuscript			
Final approval of the version and agreement to be accountable for all aspects of the work			



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