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The perceived impact of physician shortages on human resource strategies in German hospitals – a resource dependency perspective

Helge Schnack, Sarah Anna Katharina Uthoff and Lena Ansmann
Division for Organizational Health Services Research, Department of Health Services Research, School of Medicine and Health Sciences, Carl von Ossietzky University Oldenburg, Oldenburg, Germany

Abstract

Purpose – Like other European countries, Germany is facing regional physician shortages, which have several consequences on patient care. This study analyzes how hospitals perceive physician shortages and which strategies they adopt to address them. As a theoretical framework, the resource dependency theory is chosen.

Design/methodology/approach – The authors conducted 20 semi-structured expert interviews with human resource officers, human resource directors, and executive directors from hospitals in the northwest of Germany. Hospitals of different ownership types, of varying sizes and from rural and urban locations were included in the sample. The interviews were analyzed by using qualitative content analysis.

Findings – The interviewees reported that human resource departments in hospitals expand their recruiting activities and no longer rely on one single recruiting instrument. In addition, they try to adapt their retaining measures to physicians' needs and offer a broad range of employment benefits (e.g. childcare) to increase attractiveness. The study also reveals that interviewees from small and rural hospitals report more difficulties with attracting new staff and therefore focus on recruiting physicians from abroad.

Practical implications – Since the staffing situation in German hospitals will not change in the short term, the study provides suggestions for hospital managers and health policy decision-makers in dealing with physician shortages.

Originality/value – This study uses the resource dependency theory to explain hospitals' strategies for dealing with healthcare staff shortages for the first time.

Keywords Staff shortage, Resource dependency, Hospital, Environment, Strategy, Human resources management

Paper type Research paper

Background

Physician shortages and their impact on hospitals

In Europe, many healthcare systems are facing physician shortages (OECD, 2019b; Dubas-Jakóbczyk *et al.*, 2019; Attström *et al.*, 2014). Physician shortages in hospitals are linked to several reasons, such as difficult working conditions, insufficient workforce planning, inadequate medical training capacity, and an aging workforce (Michel and Ecarnot, 2020;

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Liu *et al.*, 2017; OECD, 2019a). Simultaneously, demographic changes and rising numbers of multimorbid or chronically ill patients are increasing the demand for healthcare services (Palladino *et al.*, 2019; Rechel *et al.*, 2013). As physicians play a key role in hospitals, a lack of physicians may provoke severe consequences on patient care, e.g. through longer waiting times or the restriction of surgical procedures and other healthcare services (OECD, 2019e, f; Schermuly *et al.*, 2015). Physician shortages may also have an impact on working conditions in hospitals since unfilled positions require additional work of the permanent staff leading to a higher workload and stress (Kawasaki *et al.*, 2009; Tomljenovic *et al.*, 2014; OECD, 2019e). Qualitative studies by McGowan *et al.* (2013) and Flowerdew *et al.* (2012) showed that staff shortages were seen as a main work-related stressor by physicians and other healthcare staff. As a result, this might cause physicians to leave their profession or–in some cases – even emigrate to another country (Degen *et al.*, 2015; Humphries *et al.*, 2019). In turn, residency and medical training are affected due to a lack of staff or the permanent staff being too busy to train residents (McGowan *et al.*, 2013; Pflipsen *et al.*, 2019). Previous research showed that residents' intention to leave clinical practice is higher when they experience poor training conditions or no social support (Degen *et al.*, 2014; Ochsmann, 2012). From the perspective of hospital management, a lack of physicians makes human resource planning more difficult, especially if vacancies cannot be filled (Dubas-Jakóbczyk *et al.*, 2019).

To counteract physician shortages, hospitals can choose from a large variety of measures to attract new staff, such as financial incentives, family-friendly practices, or the promotion of a healthy work-life balance (Kroezen *et al.*, 2015). However, recruiting and retaining physicians can be more challenging in some hospital locations. Hospitals in rural locations have more difficulties attracting new staff because fewer physicians are available due to a lower population density (Ono *et al.*, 2014; Oliveira *et al.*, 2017). In addition, physicians might be less willing to work in a rural area because they have professional or social concerns such as fewer career opportunities or isolation from peers (Ono *et al.*, 2014; OECD, 2019c). Furthermore, the hospital's size or specialization plays an important role in the recruitment and retention of physicians. Larger hospitals have fewer difficulties in recruiting physicians because they usually provide multidisciplinary or specialist healthcare and therefore offer more career options for physicians (Dussault and Franceschini, 2006; Dubas-Jakóbczyk *et al.*, 2019). In turn, small and more generalist hospitals experience more difficulties in recruiting new staff because they offer fewer career options due to limited technological facilities (Mollahaliloðlu *et al.*, 2015; Mohammadiaghdam *et al.*, 2020; Domagała *et al.*, 2018). These issues might lead to an increase in the (rural-urban) misallocation of physicians (Kozhimannil *et al.*, 2015; Fannin and Barnes, 2007).

Physician shortages in German hospitals

In Germany, physicians provide care in outpatient settings (e.g. private practices) or inpatient facilities (e.g. hospital, or rehabilitation clinics). Hospitals play an important role in the German healthcare system, as reflected by a large number of hospital beds and physicians employed in hospitals (European Statistical Office, 2020; OECD, 2019d). Since 2004, the number of physicians working in hospitals has increased steadily (OECD, 2019d). In addition, the German healthcare system relies heavily on physicians from abroad, whose number has more than doubled within the last ten years (German Medical Association, 2019). This indicates a rising demand for physicians, which is further accelerated by a trend towards an aging physician workforce (OECD, 2019d). The number of medical students, on the other hand, has remained stable for decades and has been only slightly increasing since 2010 (Federal Statistical Office, 2019). Simultaneously, there is a high female participation in the physician workforce, and approximately 46% of all physicians working in hospitals are women (Federal Statistical Office, 2020). One-third of them work part-time, with part-time

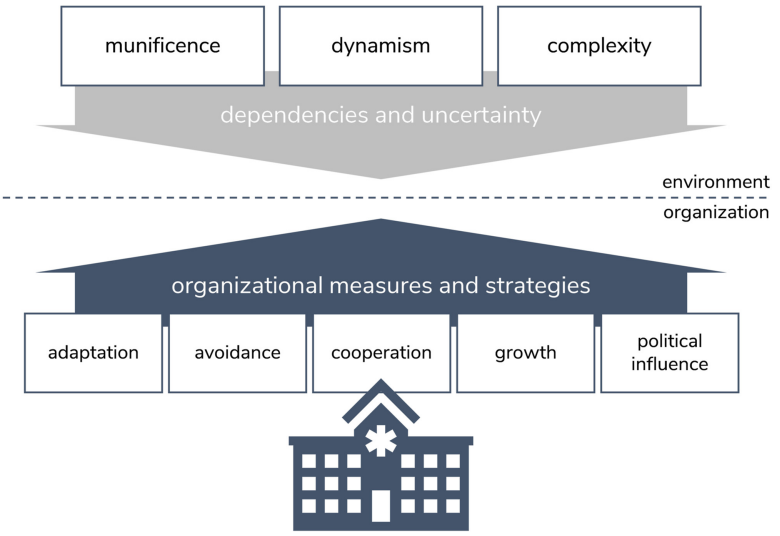
work having been on the rise since 2004 (Federal Statistical Office, 2020). This poses various challenges for hospitals because women tend to work fewer hours than their male colleagues due to family responsibilities (Simoens *et al.*, 2005; Lauchart *et al.*, 2019). However, recent studies indicate that even men are increasingly working part-time because of family responsibilities (Hancke *et al.*, 2014; Schott *et al.*, 2017; Federal Statistical Office, 2020). This also leads to a reduction of physician hours.

Despite the comparatively high number of physicians in the German healthcare system, further indicators point to an increasing demand for physicians. The unemployment rate for physicians remains on a low level and the average time to fill physician positions is high (Federal Employment Agency, 2018). Even though average vacancy times have been slightly decreasing since 2012, the Federal Employment Agency has identified physician shortages in several states in Germany (Federal Employment Agency, 2018, 2019). In a study conducted by the German Hospital Institute in 2019, 75% of all hospitals surveyed had difficulties filling their physician positions – compared to 60% in 2016 (Blum *et al.*, 2019). Rural areas are particularly affected by physician shortages, while physician unemployment rates are higher in urban regions (Federal Employment Agency, 2019). A survey of hospital chief executive officers conducted by Winter *et al.* (2020) revealed that approximately 52% of hospitals reported physician shortages, and hospitals located in urban areas had lower vacancy times than those in rural areas. In addition to geographical differences, variations were found between disciplines, with physician shortages being particularly pronounced in fields such as geriatrics, gastroenterology, or anesthesia (Martin, 2019; Papenfuß and Roch, 2012). In a study of senior surgeons in hospitals, Vallböhmer *et al.* (2019) found that 80% see a decline in the number of applicants, and Blum *et al.* (2020) found that hospitals experience increasing difficulties with recruiting physicians in obstetrics. To date, no studies exist which focus on physician shortages, their effects, and countermeasures in German hospitals from a qualitative perspective. Previous studies also lack a comprehensive picture of physician shortages and their determinants (Winter *et al.*, 2020). By choosing a qualitative approach this study attempts to fill this research gap, while also considering hospital-specific differences.

Theoretical approach – physicians as critical resources for hospitals

In order to understand how hospitals deal with physician shortages, we apply the resource dependency theory (RDT) (Pfeffer and Salancik, 2003). The RDT emphasizes that organizations are not self-sufficient and depend on resources from their environments (e.g. personnel or money). Dependencies are even higher if the resources are indispensable for the organization and represent so-called *critical resources* (Pfeffer and Salancik, 2003). As dependencies create uncertainty, organizations and their decision makers try to reduce it by managing their resource environment (Niehüser, 2008). According to Yeager *et al.* (2014) the resource environment of organizations consists of three dimensions: munificence, dynamism, and complexity (see Figure 1).

Munificence includes the availability and accessibility of (critical) resources (Pfeffer and Salancik, 2003). If a resource is scarce or access to it is limited, uncertainty is higher because "firms typically lack exclusive control over these resources" (Menachemi *et al.*, 2011, p. 277). Changes in the availability or accessibility of a resource are called environmental *dynamism*. The higher the rate of change in resource munificence, the more complicated it is for an organization and its decision-makers to capture their environment (Menachemi *et al.*, 2012). This causes uncertainty for organizations. When making decisions, organizations need to consider various actors and elements in their environments (Patidar *et al.*, 2017). In the RDT, this aspect is represented by the dimension of environmental *complexity,* which includes, e.g. stakeholders, competitors, laws, or other regulations. Like environmental dynamism, environmental complexity increases uncertainty because more actors or elements are connected to each other, and interdependencies are higher (Pfeffer and Salancik, 2003).



Source(s): Own illustration based on Pfeffer and Salancik, 2003 and Yeager *et al.*, 2014

Figure 1.
Organizations and their environment

Compared to other organizational theories, RDT emphasizes that organizations are not helplessly exposed to their environments (Davis and Cobb, 2010). To cope with them, they use various strategies, including adapting to or avoiding environmental influences, cooperation, growth, or political influence (see Figure 1) (Niehüser, 2008). *Adapting* to their environments means that organizations assess the needs of actors or organizations who control critical resources and adjust their strategies according to those needs. The second strategy includes measures to *avoid* dependencies on critical resources. This means that organizations build inventories, develop new sources (diversification), or replace existing resources (substitution). In addition, organizations can join forces through *cooperation*. Cooperation involves more or less coordinated interorganizational structures and ranges from loose agreements to joint ventures (Davis and Cobb, 2010). If organizations work together, they can reduce uncertainties by, e.g. sharing resources or exchanging information. RDT postulates that organizations can manage dependencies through organizational *growth* or mergers. Mergers offer many opportunities for organizations because they can secure the resource flow and minimize uncertainty (Pfeffer and Salancik, 2003). As the environment is the result of organizations and their actions, organizations can also *influence* their environments (Hillman *et al.*, 2009). Organizations might use political measures, e.g. through interest groups that create a more favorable environment for them. Pfeffer and Salancik (2003) also emphasize the role of management and sub-units or departments when it comes to selecting a certain strategy. They assess the environment and make decisions based on their perception.

In sum, the RDT facilitates explaining organizational strategies or structures by their resource environment. In the case of hospitals, physicians are a critical resource because hospitals highly depend on them and their expertise (Wilkesmann *et al.*, 2020). Dependencies are even higher when hospitals need highly specialized physicians, such as geriatricians or gastroenterologists, who are in short supply (Russo *et al.*, 2020; Martin, 2019; Petriceks *et al.*, 2018). However, few studies apply the RDT to the hospital sector (Yeager *et al.*, 2014). Most of these studies focus on the environmental influence on hospital performance, structural

changes within hospitals, or hospital cooperation (Menachemi *et al.*, 2012; Kazley and Ozcan, 2007; Ahmadi *et al.*, 2018; Spaulding *et al.*, 2018; Yeager *et al.*, 2015; Patidar *et al.*, 2017). In a longitudinal study of hospital nurse staffing levels, Shin *et al.* (2020) found that market conditions (e.g. competition) have a positive effect on nurse staffing levels. To the best of our knowledge, no study has applied the RDT to physician shortages in hospitals.

Research question

By using the RDT as a theoretical framework, this study aims to answer the following research questions: How do human resource decision-makers in hospitals perceive physician shortages and their impact on the hospital? What organizational strategies and measures do hospitals use to counteract physician shortages?

Methodology

Research design

In order to answer the research question, this cross-sectional study uses a qualitative approach (Pope and Mays, 2006). We focus on the organizational level and therefore conducted semi-structured expert interviews with human resource officers, human resource directors, and hospital executive directors (Bogner *et al.*, 2009). This interview form makes it possible to access the expert's organizational (task-related) knowledge and simultaneously reconstruct his or her general know-how about a specific field (Pfadenhauer, 2009). To ensure explicit and comprehensive reporting of the qualitative research design, the COREQ-checklist was followed (Tong *et al.*, 2007).

Sampling

Interviewees were recruited from hospitals in the northwest of Germany (Lower Saxony and Bremen). As a sampling strategy, a purposeful sampling approach was used, and cases were identified based on predetermined criteria characterizing the German hospital sector: ownership, size, and location (Palinkas *et al.*, 2015). Hospital ownership can be differentiated as for-profit, non-profit, and public ownership [1]. Hospital size (measured in number of beds) was an additional sampling criterion. We included hospitals from both rural and urban areas to account for regional differences. Potential interviewees were recruited as experts based on their involvement in the recruitment and retention processes of physicians. This included human resource officers, directors of human resource departments, and hospital executive directors. Table 1 gives an overview of sample characteristics. As two interviewees were from the same hospital, 20 interviews were held and 19 hospitals included.

Data collection

Potential interviewees were contacted via e-mail and follow-up phone calls. In total, 20 interviews took place face-to-face ($n = 15$) or by telephone ($n = 5$) between September 2019 and October 2020. The interviews lasted between 30 and 65 min, and field notes were taken afterward. Before the actual field work took place, three informal interviews with human resource managers and officers were held to obtain first insights into the topic. Based on these interviews, the RDT and further research literature, a semi-structured interview guide was developed, pre-tested, and adjusted accordingly. The guide addressed the following main topics: the perception of physician shortages, their impact on the hospital as well as organizational measures, and strategies used to recruit or retain physicians. To gather further information about the interviewees and the organizational context, a short questionnaire was filled out during the interview.

Organizational characteristics	*n* (%)
Hospital ownership	
Public	8 (42)
Private non-profit	6 (32)
Private for-profit	5 (26)
Number of beds	
0–200 beds	5 (26)
201–400 beds	10 (53)
401–600 beds	2 (11)
more than 600 beds	2 (11)
Location	
Rural	11 (58)
Urban	8 (42)
Individual characteristics	
Occupation	
Human resources officer	3 (15)
Human resources director	13 (65)
Hospital executive director	4 (20)

Table 1.
Organizational and interviewee characteristics

Data analysis

Every interview was recorded, transcribed verbatim, and anonymized afterward. Before analyzing the data, a case summary for every interview was written. The interviews were analyzed using qualitative structuring content analysis according to Kuckartz (2016). Firstly, main categories were created deductively based on the interview guide. Secondly, sub-categories were developed inductively during the coding process (Schmidt, 2010; Kuckartz, 2016). To validate the categories, five interviews were coded by two researchers (HS, SAKU) with subsequent discussion to achieve consensus. During the coding process we used MAXQDA Analytics Pro 2020 software (version 20.0.4). Table 2 shows the final category system.

Ethics

All interviewees were informed about the study both orally and in writing and gave their written informed consent. In addition, the study was approved by the ethics committee of the School of Medicine and Health Sciences (approval code 2019–101) and by the data protection officer of the Carl von Ossietzky University of Oldenburg.

Results

The results of the interviews are presented in the following part. For better readability, this section is divided into two parts corresponding to the categories from Table 2: perception of physician shortages and their impact on the hospital (see Table 2 category 1 "perception of physician shortages") and hospital strategies against physician shortages (category 2 "organizational measures and strategies").

Perception of physician shortages and their impact on the hospital

Nearly all interviewees reported physician shortages on the specialist level. However, physician shortages varied between disciplines. Most of the interviewees named physician shortages in disciplines such as neurology, gynecology, and anesthesia. In a few cases,

1. Perception of physician shortages
1.1 Disciplines and specializations affected by physician shortages
1.2 Differences between hospitals (in terms of size, ownership and location)
1.3 Past and future changes in physician shortages
1.4 Further reasons for physician shortages
1.5 Consequences for patient care and hospital staff
2. Organizational measures and strategies
2.1 Recruitment and retention measures
2.2 Recruitment and retention measures for physicians from abroad
2.3 Family-friendly measures
2.4 Cooperation with hospitals and other health organizations
2.5 Past and future changes in the recruitment and retention measures

Table 2. Category system

Note(s): Categories 1. and 2. represent the main categories and categories 1.1 to 1.5 and 2.1 to 2.5 the sub-categories

patient care was perceived to be affected by physician shortages. In this context, interviewees mentioned bed closures, surgical cancellations, or, in the case of a small rural hospital, the closure of a gynecology ward due to "*an extreme shortage of staff*" (*D312*). The most commonly perceived impact brought up in the interviews is overtime work required from permanent staff. This leads to a higher workload and stress, especially if physician positions cannot be filled for a longer time. The chief executive officer of an urban hospital illustrated this by the example of on-call duties:

> On a day-to-day basis, patient care functions well, but [. . .] the limited number of staff has to cope with the foreground services, on-call duties, and the specialist background, which hasn't become any less. But the same number of [on-call] duties is distributed among significantly fewer people, so that the workload also increases enormously [. . .]. (O312)

Especially smaller hospitals reported workload-related difficulties because they have smaller units and fewer physicians to compensate staff shortages.

In line with previous findings, differences in the perception of physician shortages vary between hospitals depending on their location. Interviewees from rural hospitals tend to have more difficulties recruiting physicians. As possible reasons, they mentioned the higher attractiveness of cities. The same is the case for small hospitals with fewer beds. In Germany, residency training opportunities vary depending on the size of a hospital, and those with fewer beds (and wards) usually can provide residency training only for a limited time and/or in fewer disciplines. Six interviewees viewed this as a clear disadvantage for their hospital because they can offer fewer career options for residents:

> The smaller a hospital becomes, the less chance there is of getting authorization for residency training. [. . .] If I have a small hospital, for example, I only have 24 or 36 months of authorization for residency training, but I need 48 [months] to [. . .] make the resident a specialist. By reducing the authorization for residency training, I force the resident to change his location and [. . .] also his place of residence. And in large hospitals, the entire specialist training is possible in almost all disciplines. (L311)

Additionally, many interviewees saw a decline in the number of available physicians, mostly noticeable through a decrease in applications. As an explanation for a declining availability of physicians, interviewees mentioned changing work-related demands. They emphasized that there is a new generation of physicians that places more value on work-life balance:

> There are hardly any physicians left who apply and say, I want a forty-hour job. [. . .] You really notice a certain generation, which now also places great importance on [. . .] how I can reconcile my job with my free time and therefore also my family. (Y212)

As a result, physicians and especially residents tend to work part-time. This poses various challenges for hospitals because it leads to a reduction in physician hours. Furthermore, residency training is extended if residents work fewer hours. Other interviewees pointed out that this trend is accelerating because of the increase in female physicians, who tend to work part-time due to family responsibilities.

Changes in resource flow are also due the fact that hospitals operate in a highly regulated environment, which includes governmental acts and laws. In that regard, interviewees mentioned labor laws or collective bargaining agreements, which reduce the maximum working hours or the number of on-call duties per month. Especially interviewees from rural hospitals emphasized that increasing the number of university places would boost the physician supply and help overcome physician shortages. Furthermore, the interviewees highlighted that the competition for physicians is high in the hospital sector, and in some cases leads to the point of other hospitals trying to poach physicians:

> And what is of course always an issue is poaching physicians [. . .]. [H]ospitals, which are in great [. . .] need of personnel, are of course ready to make concessions, and out of desperation, they also approach physicians in other hospitals. (W112)

Most of the interviewees mentioned high hospital density as a possible reason for the strong competition, and even healthcare organizations outside the hospital sector, such as practices, are considered competitors because of their more family-friendly working hours.

Hospitals are also confronted with rising cost pressures because physician salaries are increasing. The interviewees explained the rising salaries with the good *"bargaining position"* (*G212*) of physicians due to the shortages. As a consequence, physicians are able to make demands, and hospitals have to decide whether to meet them or not. This is visible already during the recruitment process:

> For example, a very great deal of effort is put into making a job interview possible. Even though three out of four people involved really have no time at all, and only the applicant can come on that day. Then it is made possible somehow. [. . .] It just takes a lot of effort, and in the end, you never know if it is worth it. It could be that the applicant comes in and says, "God, I definitely don't want to work here" or has better offers. (E111)

In this context, two interviewees mentioned that even after signing the job contract, applicants did not appear on the first day of work because of another job offer. As a result, the interviewees accelerated the hiring process to prevent applicants from accepting other job offers.

Hospital strategies against physician shortages

In order to recruit physicians, the interviewees mentioned the following recruitment instruments: job advertisements, recruitment agencies or headhunters, and personal networks. Interviewees also explained that they do not rely on a single recruitment instrument and tend to expand their activities. As the example of job advertisements illustrates, rural hospitals in particular reported having stopped placing job advertisements in newspapers or journals and instead using alternative media, e.g. social network platforms:

> Of course, we are currently trying to advertise jobs [. . .] online, even nationwide, so that we can somehow find someone. We have noticed that there is no response at all to print media. (H212)

As the effectiveness of job advertisements seems to vary, most of the interviewees additionally rely on recruiting agencies. According to the interviewees, these agencies usually recruit physicians from abroad who want to complete their residency training. When it comes to specialist or chief physician positions, interviewees explained that hospitals increasingly use headhunters. The interviewees also highlighted the importance of using

internal resources, especially personal networks of their own employees. Most of the interviewees agreed that this is one of the most effective recruiting channels. Therefore, some hospitals introduced a bonus program for employees who recruit physicians through their own contacts.

When it comes to recruiting residents, hospitals focus on two target groups: (1) medical students or graduates and (2) physicians from abroad. In order to attract students or graduates, some interviewees mentioned attending career fairs. If hospitals have a teaching status or are part of a medical school, they offer clinical internships for medical students. During the internship, students are offered *"all-round carefree packages"* (*C112*), which include accommodation, meals, or even scholarships. The same applies to physicians from abroad, and especially rural hospitals mentioned a focus on recruiting physicians from other countries. Common recruiting channels are agencies or personal contacts. Most of the interviewees mentioned difficulties regarding the qualifications and language skills of physicians from abroad. In response, hospitals offer language courses or internships before physicians receive their license to practice [2]. Some interviewees even mentioned providing accommodation, meals, or financial support during the internships:

> We have interns [physicians from abroad] here without end. [. . .] And we do spoil them: They get insight everywhere, we accommodate them, so they don't need to worry about a roof over their heads, they get language courses. We even have an online language course tool. (L311)

In addition to the recruitment activities, hospitals offer various retention measures. Due to the increasing need for more work-life balance, most of the interviewees mentioned offering part-time employment, individually tailored working hours or schedules:

> Of course, we try to accept every offer of working hours from qualified people. This goes as far as almost telling some people to pick and choose how much they want to work. (A221)

According to the interviewees, an increase in part-time work poses several challenges. Some cited difficulties in the organization of on-call duties or in coordinating work schedules. Alongside part-time work, interviewees mentioned offering family-friendly measures, such as childcare services.

When it comes to cooperation with other healthcare organizations, most interviewees mentioned only loose collaborations with hospitals and exchanges of physicians as part of residency training. A possible reason for not engaging in joint recruitment activities seems to be the high competition between hospitals:

> What we don't do is act collectively when it comes to recruitment [. . .] because of course we are already somehow in [. . .] a real competition. (B131)

Thus, hospitals exchange physicians only if it is in their mutual interest, like in the case of residency training. Especially interviewees from for-profit hospitals that are part of a hospital group mentioned being at an advantage because they are able to exchange physicians more easily, e.g. via temporary work. In addition, some hospitals cooperate with outpatient (general or specialist) practices to cover on-call duty, provide patient care or manage residency training.

Discussion

In this study, we examined how hospitals in north-western Germany experience physician shortages and to what extent they affect the hospital, its staff, and patient care. We also investigated how hospitals handle physician shortages and which strategies they use to attract and retain physicians. The results show that hospitals operate in a complex environment that is characterized by, e.g. a changing availability of physicians or a high competition for physicians. Therefore, they perceive and react to physician shortages differently.

Hospital perceptions of physician shortages and countermeasures

In terms of the perception of physician shortages and their impact, almost all hospitals included in the study encounter physician shortages on the specialist level, with some variations between medical disciplines. This could be explained by the fact that fewer specialists are available on the market in certain disciplines such as neurology, gynecology and anesthesia (Martin, 2019). However, few consequences for direct patient care (e.g. cancellation of surgeries) were mentioned. This might be due to the fact that most of the interviewees cited the use of locum tenens physicians for compensating physician shortages. In contrast, Winter *et al.* (2020) found that staff shortages and especially a high fluctuation of physicians adversely affect patient satisfaction. According to the interviewees, the most noticeable impact of physician shortages is a higher workload for the permanent staff. This presents a major challenge because physicians experiencing a high workload have been found to harbor greater intentions to leave their hospital (Jackson *et al.*, 2018; Hämmig, 2018; Degen *et al.*, 2015). Furthermore, we found that hospitals' perception of physician shortages varied by their size and location. Especially interviewees from small and rural hospitals reported more difficulties in filling physician positions. As an explanation, they mentioned a lower attractiveness of rural compared to urban locations and missing authorization for full residency training. Previous research has confirmed the location and training opportunities play an important role in residents' hospital choice (Necknig *et al.*, 2018; Renkawitz *et al.*, 2013; Joachim *et al.*, 2020).

In order to deal with physician shortages, hospitals broaden their recruitment activities to avoid focusing on one recruiting channel only. Heil (2013) came to a similar conclusion, and in a study of hospital chief executive officers, Oppel *et al.* (2017) demonstrated the importance of target group-oriented recruitment and retention measures with regard to hospital employee attitudes. As a result, the interviewees cited special measures for medical students (e.g. scholarships), physicians from abroad (e.g. language courses) and, family-friendly measures (e.g. child care). Hospitals also offer all kinds of working time models for physicians in an effort to respond to increasing demands regarding work-life balance.

The resource dependency of hospitals

The RDT assumes that organizations are confronted with a more or less munificent, dynamic, and complex environment, potentially leading to uncertainty (see also Figure 1) (Yeager *et al.*, 2014). The study results confirm the hypothesis of the RDT that uncertainty is higher if hospitals operate in an environment where resources (here: physicians) are scarce. This is mainly the case in rural areas. A study by Shin *et al.* (2020) confirmed that hospitals in more munificent environments (urban locations or higher per capita income) have higher staffing levels. Furthermore, most interviewees mentioned a change in the availability of physicians, as reflected by a decrease in applications and an increase in part-time work. As assumed by the RDT, this dynamism leads to increasing uncertainty because it causes a temporary shortfall in the physician workforce and poses challenges for hospitals, e.g. in work scheduling or on-call duties (Simoens and Hurst, 2006). Hospitals also operate in a complex environment, and the interviewees mentioned, among others, labor laws or collective bargaining agreements, which influence the number of on-call duties or maximum working hours. Besides laws or regulations, hospitals need to consider competitors such as other hospitals or healthcare organizations (e.g. outpatient practices). Due to the scarcity of physicians, competition for physicians is high, which further increases uncertainty. In this context, most interviewees mentioned the use of headhunters, who usually poach physicians from other hospitals. This confirms the assumption of the RDT that organizations in competitive environments apply strategies in order to reduce uncertainty and secure the resource flow (Patidar *et al.*, 2017; Yeager *et al.*, 2015).

Moreover, the results from the interviews show that hospitals adapt their recruitment and retention strategies to secure resources. If hospital decision makers do not respond to the

physicians' needs, they risk losing them. Interviewees cited efforts to speed up the application process as a response to this situation. As physicians' work-life balance seems to gain importance, hospitals are also offering various kinds of part-time work models. Additionally, the interviewees mentioned a broad range of retention measures for physicians with families, medical students, or physicians from abroad. Another strategy mentioned during the interviews is the avoidance of dependencies in the form of hospitals relying on several recruitment instruments. These results are consistent with the RDT and confirm that hospitals are diversifying their recruiting strategies (Pfeffer and Salancik, 2003). Especially hospitals that operate in a less munificent environment therefore specialize on recruiting physicians from abroad. Due to the high competition for physicians, hospitals only loosely cooperate with each other and cooperations are only initiated when they benefit all organizations involved.

Strength and limitations

The sample of hospitals of different structural characteristics gives an important insight into hospitals' perceptions of and reactions to physician shortages. However, purposeful sampling of hospitals does not allow drawing conclusions about the German hospital sector as a whole since, e.g. only two larger hospitals (with more than 600 beds) were included in the sample. Considering the particularities of the German healthcare system, the results might not be completely transferable to other countries. However, as environmental complexity is similar in other healthcare systems, the results may be at least partly applicable to different contexts (Yeager *et al.*, 2015). Compared to the existing quantitative studies, this study sheds light on physician shortages from a qualitative perspective, which provides a more extensive picture of how hospital decision-makers view and react to physician shortages. To our best knowledge, this is currently the only study that applies the RDT to physician shortages in hospitals. The strength of the RDT is that it is useful for understanding the environment of organizations and organizational behavior (Davis and Cobb, 2010). As shown in the study, recruitment and retention activities could be explained by the hospitals' need to secure resources and to reduce uncertainty. Furthermore, the interviews were partly conducted during the COVID-19 pandemic, and some of the interviews were held via telephone. Some interviewees mentioned the pandemic affecting their hospitals because surgeries had to be canceled or female staff were prohibited from working during pregnancy.

Conclusion

Since few existing studies have focused on the environmental and organizational aspects of physician shortages, this study makes an important contribution to filling this research gap. We showed that physician shortages remain a relevant issue in the hospital sector, with small and rural hospitals in particular experiencing more difficulties attracting physicians. Some interviewees also explicitly mentioned recruitment difficulties with other healthcare professionals such as nurses. Future research should therefore incorporate further qualitative and quantitative data collection on staff shortages in the healthcare sector in general because staff shortages continue to be a major challenge. This would allow further testing the theoretical assumptions of the RDT in a comprehensive manner. Since the staffing situation in hospitals will not change in the short to medium term, future studies should focus on strategies that mitigate the effects of physician shortages on staff and patient care. Those strategies may include family-friendly practices (e.g. hospital cooperation with kindergarten) to support physicians with children to return to work or retention measures that create career or training opportunities for physicians (Kroezen *et al.*, 2015; Oppel *et al.*, 2017). This topic gains further importance with the effects of staff shortages being particularly noticeable

during the COVID-19 pandemic. Moreover, as healthcare systems are constantly changing, hospitals – like other healthcare organizations – should assess their environments regularly and adapt their strategies accordingly.

Notes

1. Public hospitals are owned by, e.g. local governments or public corporations, whereas for-profit and non-profit hospitals are owned by private entities such as enterprises or foundations.
2. In order to work as physicians in Germany, physicians from abroad must have their doctoral degree recognized by a licensing authority and take a specialized language exam administered by the medical association.

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Corresponding author
Helge Schnack can be contacted at: helge.schnack1@uni-oldenburg.de