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Department of Technology Management and Supply

Master Thesis

Master of Science (M.Sc.) Business Administration

Purchasing & Supply Management

On the Role of Procurement in Inter-Organisational Staff Pooling in Healthcare

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I. Acknowledgements

This thesis addresses the opportunity of pooling of resources in order to reduce the shortage of medical staff in the Netherlands (and many other countries in the world). More specifically, it concerns the procurement perspective on contracting between pooling institutions such as hospitals or care organisations. For this project, several participants in the pooling process and experts in contracting, human resources or purchasing were interviewed. The thesis serves as a master's assignment at the University of Twente in the study program Business Administration with a specialisation in purchasing and supply management. I applied for the master's in business administration because it builds up on my prior Bachelor's programme "international business administration" at the University of Twente, and I wanted to take the chance to specialise myself in a very broad and interesting field. Upfront, I did not expect to end up with a thesis about a staff shortage in the healthcare sector. But I enjoyed the way along the road and had some great accompany.

I would like to thank my supervisors, Louise Knight and Erwin Hans, for their motivating input, patience, guidance and support. Erwin, your ideas and contacts were so valuable to me. Louise, your feedback and our discussion sessions were the keys to finishing this work. I also would like to thank all my interview partners who were willing to spend some of their precious time with me and answer my questions. Without your input, I could not present this thesis. At last, I would like to express my gratefulness to my family and friends who supported my during this project.

And now, enjoy reading my thesis.

All the best to you!

Simone Bouma

II. Abstract

Introduction: In the Netherlands, different **pressures on healthcare** exist. One of them is the **shortage of medical staff**. Therefore, different opportunities to reduce this shortage are researched. The opportunity focused on in this research is **the pooling of personnel** in healthcare institutions. Pooling describes the collection of human resources in one pool and the distribution of it as needed. To make pooling a success, it is important to have suitable **contracting arrangements** between the pooling parties. As this is a relatively new field in literature and practice, it is crucial to get an overview of what contracting implies and how it can be applied to pooling. Therefore, this research addresses how contracting arrangements can support the arrangements between pooling organisations.

Methodology: To answer the research question, a qualitative exploratory research methodology was followed. First, a literature review gained background knowledge on pooling and contracting, followed by 12 semi-structured interviews with experts on contracting and participants in pooling in healthcare. Third, Design Science Research, originally from engineering, helped to develop a contracting guidance.

Findings: The findings indicate that experts in contracting, HRM and purchasing and participants in pooling agree on the importance of **stakeholder involvement** in the process, the high importance of **communication and trust** in a relationship, a **flexible job design** and the goal to **cooperate rather than compete** for nursing staff. These findings allowed the development of a checklist that pooling participants could look at to understand what to consider when they want to contract. Surprisingly, all the factors are more of a relational than a contractual nature.

Implications: The case studies and the findings help future pooling participants to get the recipe together for a successful pooling of care staff. The checklist needs further evaluation and development to remain helpful in the future.

Keywords

Staff shortage, resource pooling, flexible staffing, purchasing, contracting, Design Science Research

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V. Abbreviations

AZE = Acute Zorg Euregio

CAO = Collectieve Arbeidsovereenkomst (collective labour agreement)

DSR = Design Science Research

HRM = human resources management

ICU = intensive care unit

KPI = key performance indicator

KTZ = KinderThuisZorg

NDA = non-disclosure agreement

OECD = Organisation for Economic Co-operation and Development

SLA = Service Level Agreement

WHO = World Health Organisation

ZZP = zelfstandige zonder personnel

1. Introduction

This chapter introduces the study as a whole, first explaining the current situation in the healthcare sector, pointing to the shortage of medical staff. Furthermore, it explains the idea of resource pooling as a potential solution and guides to the focus of this research, namely contracting between healthcare organisations for staff pooling. Moreover, the chapter describes the research question, objectives and contributions of the research.

1.1 Situation

The healthcare institutions in the healthcare sector in the Netherlands face pressure **to reduce costs**[1]. An example from the University of Rotterdam shows the importance of professional purchasing in healthcare to make healthcare investments more sustainable[2]. Additionally, the spendings of public organisations on healthcare are high and increasing. According to the Organisation for Economic Co-operation and Development (OECD), health procurement is the second-largest public spending area of the government[3].

Next to financial domains, developments in the population lead to a **higher demand for healthcare and healthcare workers**. For example, the demographic change in the population in many countries creates an imbalance between younger and older people. This gap might increase within the next years (Campbell et al., 2014). In addition to the patients, the workforce is ageing, too. In the upcoming years, the generation of the baby boomers will retire, which increases the need for nursing staff and making it challenging to keep up with the required number of health workers (Good & Bishop, 2011, p. 233). Moreover, medical progress and improved prevention make people live longer and healthier but make the shortage of healthcare workers even more apparent (Campbell et al., 2014).

Latest since Covid-19, everyone has been aware of **the perceived shortage of medical staff**, but it has existed for some time, and organisations like the World Health Organisation (WHO) discussed and recognised it. Campbell et al. (2014), who created a report for the 5WHO, found that the shortage of healthcare workers is a challenge of global priority.

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[1] https://www.erim.eur.nl/purchasing-supply-management/research/healthcare-procurement/ , accessed May 2022.
[2] https://www.erim.eur.nl/fileadmin/centre_content/purchasing_and_supply_management/RSMDiscovery20-HealthcareProcurement.pdf , accessed May 2022.
[3] https://www.oecd.org/gov/public-procurement/health/ , accessed May 2022.

Although the awareness of this problem has been risen by Covid, an intermittent shortage was already recognised in the 1990s. It should be prioritised in 2022 and further because of its rising costs (Bloom et al., 1997, p. 147)[4].

To decrease the perceived shortage of healthcare workers in the health sector, healthcare institutions have different **options** they can choose from. For example, they can contact an agency and instruct the agency to find temporary staff. A disadvantage of using agencies is the cost factor, as agencies request a very significant fee for their work (Lonsdale et al., 2010, p. 806). In addition to that, healthcare institutions try to increase their staff by recruiting new workers. Here, the facts of demographic change and the relatively low job attractiveness in the healthcare sector could be barriers. Current trends such as float nurses or flex teams are implemented as an opportunity to give a healthcare worker more flexibility in his or her job assignment and relate to the work-life balance[5]. This freedom in designing the own job should make the function of a healthcare worker more attractive and improve the work quality. Additionally, efforts to attract and bind people to the job of healthcare workers or keep them in the healthcare field by implementing educational programs are going on. However, these programs cannot change the fact that people are missing (Campbell et al., 2014).

1.2 Complication

Data collected before the pandemic forecasted that the shortage of healthcare workers would increase in the upcoming years if no solutions were found (Campbell et al., 2014). Thus, alternative solutions are necessary to research to address the problem that more personnel resources will not be available. One of these possible solutions is **the pooling of personnel**. The term pooling of resources describes the collection of (human) resources in one central area and allocating them as needed to gain a (cost) advantage (Cattani & Schmidt, 2005, p. 19). It is possible to involve an agency. However, this project aims to help eliminate or reduce the use of agencies between the healthcare worker and the healthcare-providing institution employing the healthcare worker.

[4] https://www.healthleadersmedia.com/finance/staffing-crisis-will-dominate-2022-finance-trends-heres-what-do-about-it , accessed May 2022.
[5] https://www.hosthealthcare.com/blog/pros-and-cons-to-being-a-float-nurse/ , accessed June 2022.

The idea of pooling resources in the healthcare sector is relatively new in practice and under-researched, which is why contracting needs attention, next to aspects like processes, motivations for the nursing staff and efficiency of the pooling. Supposed two or more organisations enter a pooling arrangement, they will need a contract to capture and formalise an agreement. A contract needs to be good in terms of that it clarifies the interests of the pooling parties, make people think about potential issues and regulate certain frames as payment to avoid conflicts. Contracting well is part of the procurement perspective. Therefore, I research what healthcare procurement can do in terms of **contracting** to support the pooling of capacities. Contracting usually describes the agreement between two parties in a business relationship. In the context of pooling resources, among other practical issues, (Dutch) health law has specific requirements and responsibilities that need to be clarified before organisations or care providers like hospitals can pool and share their resources. Therefore, this research aims at bringing up contracting as a relevant part to consider while pooling and how it can help in the pooling process. It needs to be clear that the research focuses on the **contracting between the staff exchanging institutions** (e.g., two hospitals) instead of contracting between an employee and an institution. More information on pooling and contracting can be found in the literature review.

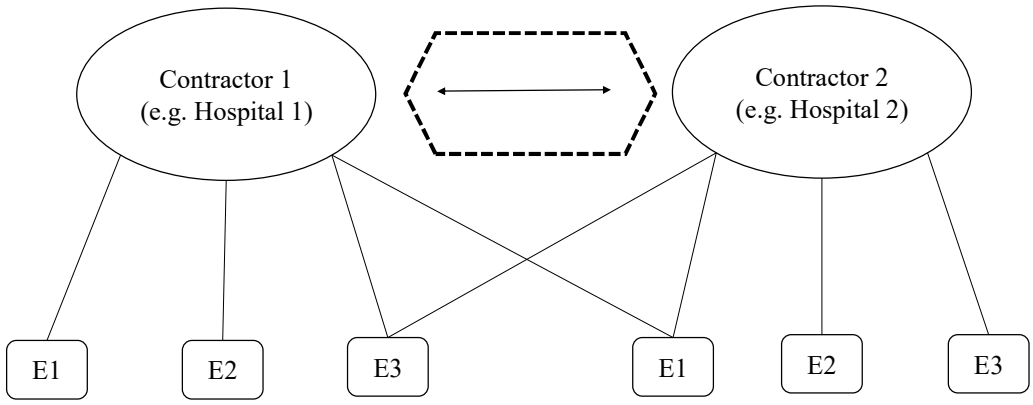

Figure 1: the basic illustration of service level agreement, used as motif throughout the report, showing relationship between pooling partners

Figure 1 represents the structure of the pooling arrangement and gives an idea of the illustration. It shows the pooling participants, the employees and the connections between the contractors. The pooling arrangements will be created between two or more parties that want to exchange staff (contractors 1 and 2 in the figure). These parties can be hospitals,

care organisations or self-employed nursing staff. To pool the resources, the parties need an agreement. For example, in the form of a service level agreement plus terms and conditions to specify, among other things, responsibilities, payment, and liability—the arrow between the two contractors pictures this arrangement. The dashed box around the arrow symbolises the zone of interest within this research. The E1, E2 and E3 (E = employee) symbolise the employed staff by the organisation or institution. This illustration is the basis for case examples that are researched during the thesis project and will be adopted for every case in the results section. Furthermore, Figure 1 will serve as a motif throughout the thesis. It will appear again at the end of the literature review, complemented with the findings of the literature review in regard to contracting and pooling. Next, it will appear adopted to each case in the results section.

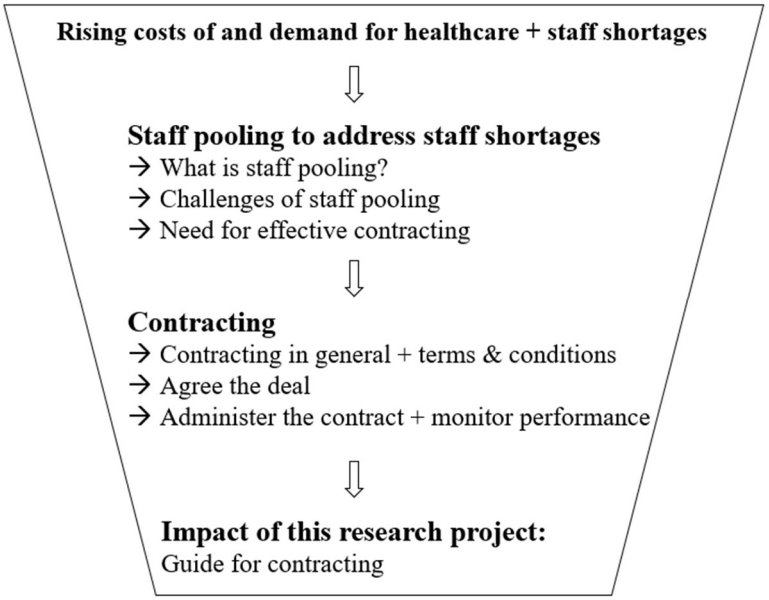

Figure 2: visualisation of research context and focus.

1.3 Research Question

To shine a light on the omnipresent perceived problem of shortage of healthcare workers from the procurement perspective, the research question answered in this Master thesis project is:

What contracting arrangements can support the pooling of personnel resources between healthcare organisations?

Objectives[6]:

The primary purpose of this Master's research project is to provide procurement's perspective on pooling capacity because this ankle in pooling did not get many attention yet. Procurement can support here, as contracting is a field of procurement. Secondly, it aims to give healthcare institutions an overview of the contracting aspects of pooling resources (focus on the future).

The following sub-questions shall help to find a guidance on contracting in pooling resources.

- *What insights from the literature regarding contracting of staff employed on a flexible basis exist? (literature review)*
- *What are the barriers to contracting in pooling staff in healthcare institutions? (literature and interviews)*
- *How can the outcome of this research (the guide) address these barriers?*

1.4 Contributions

Academic Relevance: contracting insights on the topic of pooling resources

The pandemic has drastically increased personnel shortages in the past two years. It might increase within the following years (Campbell et al., 2014). Hence, it is necessary to research new possible solutions. Therefore, academic evidence is needed to assess the idea of pooling resources between healthcare institutions. Here, contracting is necessary to understand and a part to consider before implementing pooling. This research brings knowledge from other fields to the purchasing area and identifies unusual aspects.

[6] To address problems in healthcare, the University of Twente founded the THT research program. THT stands for technology in healthcare transformations and aims to develop reliable and cost-effective healthcare technologies, creating an effective healthcare system and embedding these solutions sustainably in societies and institutions. In this circle, Master's students from different backgrounds are united to shine a light on the problem of the perceived shortage of healthcare workers from different perspectives (e.g. process efficiency, HRM, healthcare procurement). The focus is currently on the possibility of pooling healthcare workers to reduce the impact of the perceived staff shortage. In this particular research project, the perspective of healthcare procurement is taken.

Practical Relevance: Give healthcare institutions a tool

The shortage of healthcare workers is a present topic, which is therefore relevant for many people and institutions in this world in the short or long term. From the researcher's perspective, the shortage of healthcare workers is apparent, but finding solutions to reduce the shortage needs more attention. The outcome of this research should give involved parties in pooling an idea of what to consider while contracting to support their pooling process through an agreement that clarifies interests and picks up potential issues upfront. A checklist of practical issues developed throughout this research clarifies contracting and makes it more transparent. The guide could work as a starting point from which the institutions can look at contracting and figure out what they need to do in their particular case to make pooling a success.

The remaining report consists of a literature review and a methodology description. Furthermore, the interview results are presented as case examples and a pair-wise comparison. In the discussion, the checklist is given, and a conclusion provides implications, limitations and future research potential.

2. Literature

This chapter introduces the results of the literature review. It informs about the pooling of resources and the opportunities and barriers of it. Furthermore, theory used in this project and contracting in purchasing and healthcare are explained. In the end of this chapter, Figure 1 is adapted with the findings of this chapter.

2.1 Pooling of personnel resources

Pooling of personnel is one option assessed to decrease the shortage of medical staff in healthcare and it is the focus of this reserach.

2.1.1 Definition

The term pooling of resources describes the collection of (human) resources in one central area and then allocating it as needed (Cattani & Schmidt, 2005, p. 19). It is possible to involve an agency. However, this project aims to eliminate the agencies between the healthcare worker and the healthcare-providing institution employing the healthcare worker because agencies are costly and might act opportunistic and exploitative (Lonsdale et al., 2010, p. 800). Instead of using agencies, pooling participants could act more as a joint venture or collaborative partnership to share staff.

2.1.2 Pooling in healthcare

Pooling in healthcare is recently done in the form of flex or float teams (e.g. flex or float nurses). These teams aim to give more flexibility to the working force in designing their jobs[7]. Good & Bishop defined floating as a cost-effective strategy to organise staff by sending nurses from their home unit to a unit that requested staff. Staff requests from another unit could originate from sick leaves or other unexpected events (Good & Bishop, 2011, p. 231).

2.1.3 Opportunities of pooling

Cost savings could be one advantage of pooling or flexible staffing (Good & Bishop, 2011, p. 231). Furthermore, perceived benefits of working in a flex pool are, according to van

[7] https://www.hosthealthcare.com/blog/pros-and-cons-to-being-a-float-nurse/ , accessed 30th June 2022.

Krugten (2022), the **flexibility**, the possibility to **get to know other areas of an institution** as a hospital and to gain **additional skills** (van Krugten, 2022, p. 41). In their research, Good & Bishop (2011) introduced the "Willing to Walk" initiative that aimed to give nurses more **autonomy**. "Willing to Walk" allows nursing staff to voluntarily float within nursing units with the same tasks or to areas with other competencies the nurses can show. For special skills, the speciality float pool was introduced (e.g. ICU). The research builds on the skills and knowledge of the nursing staff to distribute the staff accordingly (Good & Bishop, 2011, p. 232). Hoffman & von Sadovszky (2018) researched on the staff perspective on floating and the enablers to make floating more popular among the nursing staff. As a result, nurses would appreciate getting a **buddy** at the other unit, a **mini-orientation and electronic updates on the equipment** (Hoffman & von Sadovszky, 2018, p. 580).

2.1.4 Barriers of pooling

Perceived drawbacks from floating are **feelings of anxiety, fear and frustration** (Good & Bishop, 2011, p. 231). A current research project by Elferink (2022) regarding the perspective of Intensive Care nurses on flexible deployment at three hospitals found nine influential factors. The three most important ones were the **private life of the ICU nurses, incentives and the work environmen**t. Additionally, the interview partners had a **negative attitude** towards flexible staffing (Elferink, 2022, p. 3). A third example from van Krugten (2022) found as the most important barriers the **lack of communication and the missing feeling of being part of a team**. Other barriers include the different organisational structures in the exchanging departments, the maintaining medical skills, and the different types of guidance (van Krugten, 2022, p. 38). Moreover, differences in medical terms and the unpredictability of **new protocols and practices** are barriers to consider[8]. It seems that most barriers of pooling are personnel related. This could be because pooling would be a radical change and if a change wants to be successful, the involved stakeholders need to be motivated and convinced of the change.

2.2 Theory

Using theory in research supports understanding the problem in the research stated. The theory chosen for this research is the tmake-or-buy approach. This approach is a purchasing

[8] https://www.hosthealthcare.com/blog/pros-and-cons-to-being-a-float-nurse/ , accessed 30th June 2022.

theory assessing whether to produce products or services in-house or outsource them. The make-or-buy approach was selected to explain how pooling personnel is related to purchasing decisions of personnel.So, as pooling personnel is a rather complex topic and not easy to understand, I use the make-or-buy approach to get a clearer picture of what pooling of personnel means and where it would be positioned in this theory. The make-or-buy theory is useful here because it is rather straight-forward in use and the elements can be transferred to the pooling topic. Next, the theory is introduced and defined with its underlying theories. Afterwards, the connection between the theory and the context of this research is explained.

2.2.1 The make-or-buy approach

In supply management, companies decide if they want to *make or buy* their products and services. To make or buy means either producing the products in-house or outsourcing specific tasks, e.g., assembling manufactured parts (Cousins et al., 2008, p. 28). To choose the suitable concept for a company, it can use two theories: the transaction cost economics or the resource-based view. **Transaction cost economics** describes the transaction costs necessary to use the price mechanism of the open market. Transaction costs are costs to plan, adapt or coordinate an exchange, for example, a fee against a service. The higher the transaction costs to an exchange, the higher the probability that a company will make a product or service. Transaction cost economics divides between behavioural and transaction characteristics. The behavioural characteristics include assumptions as opportunism and bounded rationality, while the transaction characteristics incorporate asset specificity and uncertainty. Asset specificity includes human asset specificity, introduced by Williamson in the 1980s. Human asset specificity describes the investment in, for example, employees to extend their knowledge (Cousins et al., 2008. p. 30). **Resource-based view** states that a company can reach a sustainable competitive advantage when its resources are valuable, rare, inimitable and not easy to substitute (Barney, 1991, p. 99). To decide whether to make or buy a product or service, a company can ask questions such as: do we have the capabilities required to make this product or service? If not, is it possible to develop the needed capabilities or purchase them? If both questions are answered with no, a company should decide to buy (Cousins et al., 2008, p. 36).

Make-or-buy theory in context of this research

How does this approach relate to the topic of this research? Make or buy of products and services can be transferred to the human resources in healthcare. “Make” could mean the human asset specificity, namely the investment in the nursing staff to keep the employee. “Buy” in this context could be that healthcare providers, such as hospitals, hire an agency to find a suitable supplier. So, “make” should be more efficient for a healthcare provider in terms of costs than buying the hiring service from an agency. One goal of pooling is eliminating the agencies to save costs. From a healthcare provider perspective, the advantages of nursing agencies are the less managerial time needed to plan the shift coverage or set up a part-time pool. Additionally, in seasons with high leave (e.g. summer), the agency provides backup staff, which leads to cost savings compared to regular staff (Bloom et al., 1997, p. 148). However, using agencies also means decreased productivity of the temporary staff because of the missing organisational knowledge (for example, storage of specific equipment). Additionally, nursing agencies can act opportunistically and be abusive towards the healthcare provider (Lonsdale et al., 2010, p. 800). Moreover, external staff can lead to confusion and disruption in teams of healthcare provider personnel (Bloom et al., 1997, p. 148). Bloom et al. (1997) introduced the term “inside contracting” which describes the agreement between a healthcare provider (e.g., a hospital) and an agency that hires the nurse staff and receives a fee from the healthcare provider. Secondly, “authority relations” exist, where the healthcare provider employs the nursing staff directly (Bloom et al., 1997, p. 148). This research focuses on authority contracting as the pooling of healthcare personnel aims to network healthcare providers and eliminate the agencies in between.

To sum up, the pooling parties in this research would aim to reduce the use of agencies and, therefore, to “buy” the staff themselves. Following the resource-based view, a healthcare provider can answer the questions stated before to see where the institution stands regarding the make-or-buy decision. If both questions are answered with “no”, a healthcare provider can assume it is not "making". It might be more in between make or buy as the hospital neither hires staff solely via agencies nor themselves.

2.3 Contracting

2.3.1 Definition

A contract in the field of purchasing is a "legally binding agreement that is the result of an offer and acceptance, with an agreed consideration" (Monczka et al., 2010, p. 329). In other words, a contract describes the agreement between two parties in a business relationship. Usually, in purchasing exist a buyer-supplier relationship where one party sells its goods or services to the other party, and the buyer has to pay for it. In the context of this project, there does not exist a typical purchasing buyer-supplier relationship, but there is common ground with buying services as the employment of staff can be viewed as a service. Usually, healthcare providers buy services as cleaning or catering. The contract in purchasing "defines the roles and responsibilities of each party" (Monczka et al., 2010, p. 329). A purchasing contract for goods consists of several elements. Mainly, it has three parts: an introduction to the contracting parties, followed by clauses. These clauses provide, among others, definitions of terms used in the contract, payment terms, liability, etc. The third part of a contract is often the schedules of, for example, lead times and inventory control (Monczka et al., 2010, p. 330).

Service level agreement

A Service Level Agreement (SLA) is a written arrangement for the purchase of a service between a buying and a selling unit (Cousins et al., 2008, p. 276; van der Valk & van Iwaarden, 2011, p. 202). It can be a self-standing contract or underly a contract (Abbasi et al., 2020, p.278). The main task of a service level agreement is to measure the quality of a service delivered by a provider through defined characteristics of the relationship. It should provide the end customer with the service he or she wants. There exist templates of SLAs, but every SLA is an individual agreement; therefore, every template needs adjustments. However, clauses such as the definition of the required level of service, how this level will be delivered, the level of support and incentives or penalties for the performance are usually included (Cousins et al., 2008, p. 276, Abbasi et al., 2020, p. 277). The service level can be determined based on demand fulfilment. In the example of Abbasi et al. (2020) about pooling inventory or capacity of a retail supplier with multiple buyers, a high demand uncertainty exists. They found that SLAs are commonly used with a focus on outcome or quality or other factors influencing the extension of a contract. Here, a target service level is agreed upon in

a specified performance review period (Abbasi et al., 2020, p. 278f.). To allocate resources to multiple buyers, several allocation policies exist. For example, allocations can be based on priority lists (e.g. first come, first serve) (Abbasi et al., 2020, p. 282f.). Challenges of SLAs are the need for detailed agreements and monitoring of the agreeing parties (Goo et al., 2009, p. 131). To make SLAs work, different characteristics should gain attention, namely foundation, change and governance. These characteristics support the development of the relationship and mutual dependence, help to solve conflicts harmoniously and gain trust (Goo et al., 2009, p. 135).

To sum up, in service purchasing, service level agreements are meant to support the monitoring of performance but also to take into account the expectations of the relationship. In the context of this research, the pooling of personnel resources might need a service level agreement to clarify the interests of the involved parties and to be able to monitor the performance of the pooling.

Quality and performance

In the clauses part of a contract, contracting parties can define specifications as the quality of the exchanged product or service (Monzcka et al., 2010, p. 330). **Quality** is traditionally defined as "conformance to specifications" (Leenders et al., 2006, p. 116). Over the years, quality extended to satisfy customer needs by combining a corporate philosophy and quality tools. To define quality in purchasing, the needs should be clarified, next to a description of the best buy and the actions of a purchaser to ensure the quality level is delivered (Leenders et al., 2006, p. 116). Among others, specification is one phase of the acquisition process. An advantage of buying with specifications is, for the buyer, that the seller is responsible for performance. A limitation is, for example, the risk that the specified product is not better than a standard product (Leenders et al., 2006, p. 120). Within this phase of specification, different types of specifications can be described. One of them is a specification by performance or function. The main goal is to specify the desired outcome; therefore, it is result- and use-oriented. How the seller reaches this outcome remains open. This could foster innovative ideas (Leenders et al., 2006, p. 121). Quality criteria could include quality system certification, quality circles and continuous improvements at production plants (Cousins et al., 2008, p. 64).

The definition of **performance** remains open to the individual companies. Measuring performance can help companies to make better decisions regarding where improvement is needed. Furthermore, communication and performance feedback are also supported by performance measuring to identify rooms for improvement (Monzcka et al., 2010, p. 470). However, measuring performance bears the risk to determine the wrong measures or data or missing important details in data analysis (Monzcka et al., 2010, p. 471). Companies have different possibilities to measure performance. For example, key performance indicators (KPI) are based on numbers related to areas as cost or quality. For example, one can measure the total inventory costs and decide to decrease them by a certain percentage within a specific time frame and measure if it worked or not (Cousins et al., 2008, p. 152f.).

2.3.2 Contracting in Healthcare

Broekhuis and Scholten (2018) found in their research that in service triads, a social contract happens before a formal contract is set up. A service triad illustrates the relationship between buyer and supplier, delivering a service to the end customer, while social contracts describe a combination of performance-oriented and behavioural-oriented standards that the contracting parties agree on as a foundation for the relationship before the formal contract terms begin (Broekhuis and Scholten, 2018, p. 1190, Li & Choi, 2009, p. 29). The delivery of healthcare by nursing staff of a healthcare institution to a client can be viewed here as a service triad. The social contract matters here because it can be assumed that in pooling relationships, sympathy and other social factors are of high importance to the involved parties. Broekhuis & Scholten (2018) recommend in their managerial implications to prepare a "mutually perceived social contract" as this will simultaneously positively influence the satisfaction with the relationship and the contract management (Broekhuis & Scholten, 2018, p. 1201). Therefore, buyers and suppliers should be clear about the kind and intensity of relationship they want to build up. It seems crucial to be honest and transparent about one's capabilities, aims and aspirations to avoid assumptions leading to false conclusions. Carnochan et al. (2019) support the importance of communication in contracting human services to identify common ground or differences on expectations regarding transparency or consistency (Carnochan et al., 2019, p. 657). When outsourcing core services, Broekhuis & Scholten (2018) emphasise the pooling of supply and integration by using the expertise of buyer and supplier in order to fulfil the buyer’s customers' needs (Broekhuis & Scholten, 2018, p.1201). This study is particularly interesting to this research

because the social contract upfront the formal contract could play an essential role in the context of personnel pooling in healthcare. It can be assumed that before institutions are willing to share their personnel resources, they should be clear about their **capabilities, interests and goals**. Therefore, this might be a point to pick up in the discussion to see whether pooling participants experienced that.

Figure 3 summarises the insights of the literature review, complementing Figure 1. On the left hand, the pooling related barriers found in literature are summarised. It includes the most important ones as the (lack of) motivation of the staff, the lack of communication, the feeling to not belong to a team anymore. Moreover, differences at the pooling institutions in terms of equipment, the use of medical terms, the unpredictability of new protocols and practices lead to resistance against pooling according to literature. On the right, the most important insights regarding contracting are summarised. In a contracting arrangement, quality, performance and payment should be defined and regulated. Upfront, contracting parties should communicate openly their expectations, capabilities and interests regarding the relationship. Also agreements on liabilities, delivery schedules and how the resources are allocated are recommended. All these insights influence the contracting arrangement between the pooling participants contractor 1 and 2 in Figure 3.

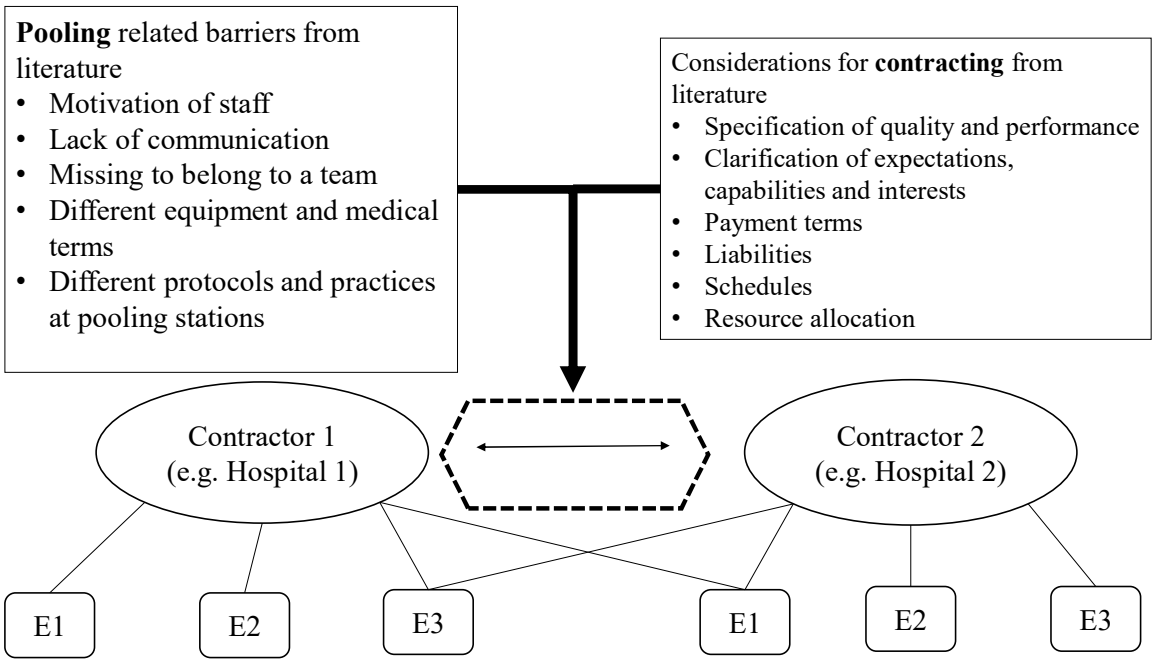

Figure 3: adoption of Figure 1 with insights from literature review

3. Methodology

This research project is highly exploratory as it discovers novel arrangements in practice. These novel arrangements do not fit in the existing purchasing types as the arrangement is about service. The service is a not for profit one in healthcare and the service as such is the personnel. The orverarching research method is the Design Science Research (DSR) even though not all steps are contained. Within DSR, the problem framing is supported by the literature review. Then, interviews were conducted to gain deeper evidence and being able to conceptualise insights from literature with practical cases with the goal to create a guide. Special about this research is the use of sensitising. This is to find themes from past research in the interviews with real-life cases and, if possible, discover new themes or the absence of themes for special reasons. In the end, with help of DSR, an artefact was developed, guiding future pooling participants in the contracting process.

3.1 Design Science Research

Design Science Research has its origin in engineering and medicine and is now also approached in the field of purchasing and supply management (Van Aken & Romme, 2009; Stange et al., 2022). In the context of this research it means recognising the problem of the shortage of healthcare workers in health institutions and then developing a practical solution opportunity, namely an understanding of how contracting can look in healthcare and how this can be approached. This approach aims at developing general knowledge to give practical solutions to field problems. Therefore, it focuses on the future instead of solely analysing the past and current state (Van Aken & Romme, 2009). It is a method to complement explanatory research by understanding a problem that needs to be solved (Van Aken, 2016). Figure 4 gives the DSR cycle of Van Aken & Romme (2009).

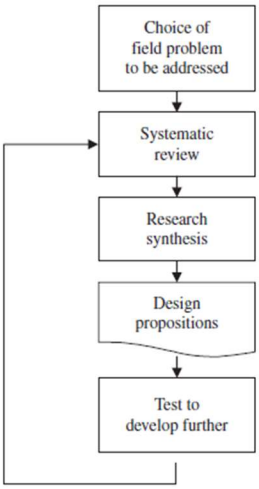

Figure 4: the Design Science Research cycle (Van Aken & Romme, 2009)

Design Science Research (DSR) distinguishes between a partial and a full design. The partial design includes the steps to understand the problem and design an artefact as a solution. In contrast, the total design goes beyond that by testing and evaluating the artefact in practice (Stange et al., 2022, see Figure 5). In this research, the partial design will be used as, due to time matters, the entire design with testing is not applicable. So, the research will bring a deeper understanding of the shortage of healthcare workers, show up a possible solution, and how this could look like as an artefact, in this case a checklist for contracting. Nevertheless, the testing and evaluation of the artefact remain open to further research.

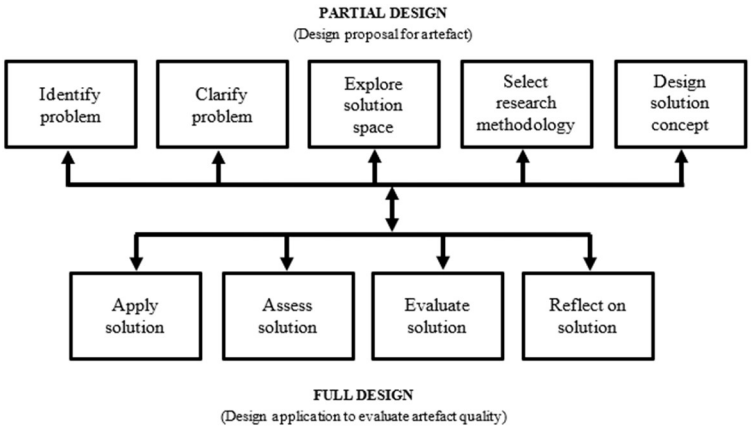

Figure 5: literature-grounded design science process (Stange et al., 2022)

How does the DSR look like in this project? Figure 6 gives an overview of the different steps. At first, the problem will be framed in an introduction, including the research question. Moreover, clarifying the problem includes the problem framing integrated into the introduction (step 1). A literature review was done for step 2 of the partial design science methodology. Step 3 (selection of research methodology) was done by interviewing different healthcare sector stakeholders. The interviews supported the deep understanding of the problem but, at the same time, inspired to the artefact that is created (discussion chapter). The evaluation and testing of the checklist will remain open for future research projects.

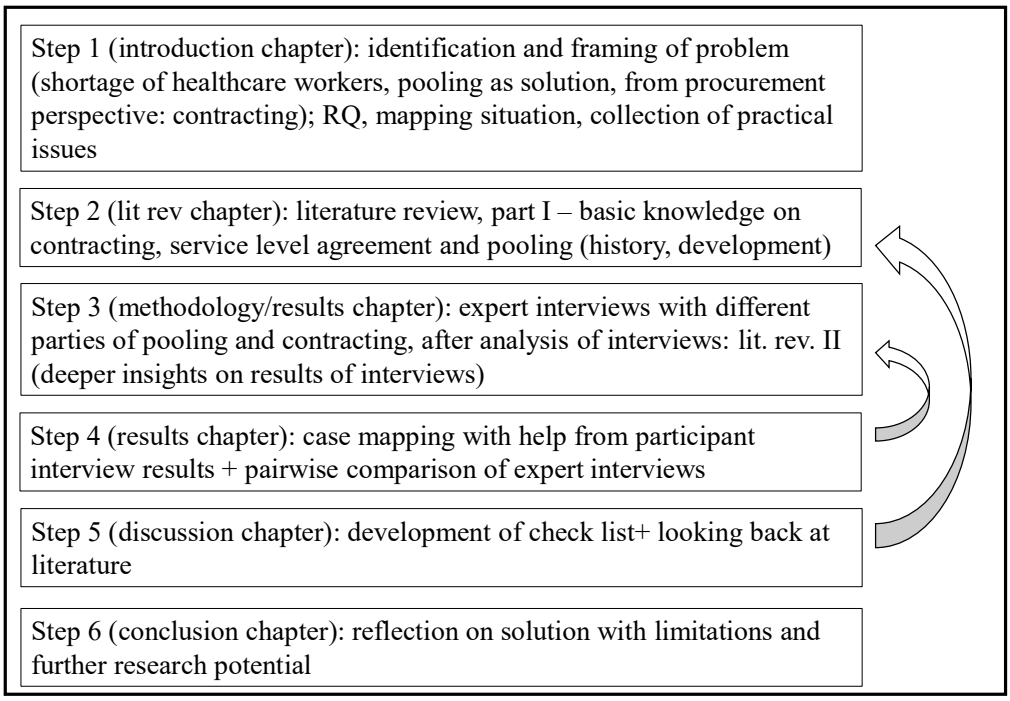

Figure 6: Adoption of Stange et al. (2022) and van Aken & Romme (2009) to thesis project

3.2 Literature review

The literature review is done in two parts. First, a keyword research was done to provide a basic understanding of healthcare procurement, contracting and resource pooling. Second, after the interviews, it helped to dive deeper into issues discovered during the interviews. The literature review is approached by an open keyword research. To broaden the scope, the snowball technique is used. The snowball technique means that from the sources that are found the references are checked and searched for potential additional sources that could add value to the literature review. As this field of research is rather neglected, grey literature and

policies were accepted to support the insights. Literature does not cover the unique combination of contracting flexible staff pooling in healthcare. Therefore, the different parts were researched independently to put it together to a clear picture afterwards.

3.3 Contracting Experts and Pooling Participants Interviews

Data collection and choice of interview partners

A **qualitative** research approach was chosen for this project to gain insights into the problem of the shortage of healthcare workers from different perspectives. Therefore, semi-structured (problem-focused expert) interviews with different parties were arranged. The aim was to gain a deeper problem understanding (step 1 + 2 in DSR process) by interpreting the interviewees' answers and supporting the interpretations with quotations (Weiss, 1995, p.3). An advantage of semi-structured interviews with mainly open-ended questions is that the interviewer could ask follow-up questions and make the interviewees share more insights and experiences (Alsaawi, 2014, p.151; Saunders et al., 2019, p. 178). The interviews made it possible to gather different views and expertise on a certain topic. The interviews provided different perspectives on the issues with contracting, the shortage of healthcare workers and the possibility of pooling capacity. From these interviews, ideas for a guide for contracting were drawn.

So, how were the interviews done? First, different cases and types of pooling arrangements are mapped based on the illustration of Figure 1. The cases originate from the network of the THT circle of the University of Twente and the experiences of the teaching staff. The cases are used to identify the first group of potential interview partners that are involved in the pooling, namely the pooling participants. Pooling participants are defined as people directly involved in the pooling process, the planning and arrangement of the pooling process or supporting the pooling of personnel resources. As experts, the second group of interview partners, people with mainly an academic background were contacted and asked to participate in this research. Most experts were teachers at university and researchers; some also had practical experiences from former or current jobs or projects. The fields of expertise of the experts incorporate contracting, human resources management (HRM) or purchasing in general. Table 1 and 3 list the interview partners. I chose for two types of interviewees because interviews with just one type could not provide a clear picture as needed for this project. The two types can complement each other in terms of theory and practice. Pooling

participants share real-life examples and experiences, while the experts share knowledge on the contracting field to add extra knowledge to the participants insights. If I would only had one type of interviewees, limited insights would be existing. In total, 12 interviews (five experts, seven participants) were conducted in English or Dutch in 2022. The interview guides can be found in appendices 1 and 2. Each interview lasted between 40 and 60 minutes. I conducted interviews with specific stakeholders in pooling and experts involved in contracting. However, I would need to reach a sufficient result. I aimed for a number of approximately 10 interviews. I achieved 12 and was able to talk to at least one participant in each case. The cases are mapped in the results chapterThe interviews were recorded after the interviewee agreed. Here, a consent form and an information sheet were handed prior to the interview to the interview partner.

Data analysis

As the research is rather investigative, it follows a mixture of inductive and deductive reasoning. Inductive reasoning is done by finding patterns in the interview data. In contrast, deductive reasoning is based on findings that emerged from the literature (see Figure 3) (Saunders et al., 2019, p. 652). After data collection, the transcription was done via the software Amberscript. The data analysis was done with several approaches. First, **thematic analysis** supported making sense of the data, getting familiar with them and identifying patterns. Thematic analysis is a tool to systematically and flexibly analyse data by identifying patterns and themes in qualitative data (Braun and Clarke, 2006, p. 77f).

Second, **memos** and memoing supported the analytical process (Lewis-Beck et al., 2004, p. 635 f.). Memoing shows the progress between looking at the data collected and finding emerging patterns. It helps to figure out parts for further investigation and deeper analysis. Especially in this research, it was helpful as the conceptualisation between expert and participant's insights is crucial for the research outcome. The memoing started while clearing the interview transcripts of typos and misunderstandings. It was further developed during the coding process and finalised in the fundamental analysis and writing of that chapter in the report. It provided profound understanding and insights into the interviews.

Third, after coding the interviews, the insights of the two groups were internally compared. The insights of the pooling participants were studied in **a cross-case analysis**. In contrast, the insights of the contracting experts followed a **pair-wise comparison**. The cross-case analysis was done to identify where the participants experienced the same or different issues

and to see what they expected or hoped to achieve by pooling. The pair-wise comparison among the experts was chosen to identify similar and unique views despite having different expertise and focuses. It was also tried to find contradicting views, but none were found and therefore cut out of the report.

Last, the insights from the data analysis were conceptualised in an artefact, namely a guide that should help future pooling participants understand what to consider when they want to contract. **Conceptualisation** was essential and valuable in this research. It was necessary because of the exploratory nature of the project and the two different types of interview partners. If the insights of the contracting experts and pooling participants were treated separately, it would not be possible to identify helpful contracting tools for pooling. For example, the pooling participants could point, without knowing it, towards a relevant issue for contracting. However, they categorise it as, for example, an HRM issue. Therefore, conceptualisation helps to connect the academic field with the practice and helps the practice to improve what they do.

4. Results

The results chapter introduces the cases that emerged from the interviews with the participants in pooling and insights from the expert interviews. It begins with the case descriptions, which give insights into who pools and since when. Moreover, which opportunities and barriers are experienced, what was learned and what is planned for the future. The case descriptions are followed by a cross-case analysis, resulting in a summary of themes. Afterwards, the insights from the different experts are shared and compared in a pair-wise comparison.

4.1 Insights from participants

Table 1 shows the interviewees from the participant's interviews, giving the name, the kind of instution and the case number.

Table 1: interview partners from participant's interviews

Name	Kind of institution	Case
KNOV	Midwifery organisation	1
Manna & Zorgschakel	Care organisation and head pooling organisation	2
UMC Groningen/ Beatrix Kinderziekenhuis	Research hospital	3
Intus	Software development company	4
De Rotterdamse Zorg	Network organisation	5
Acute Zorg Euregio	Network organisation	6

4.2 Case introduction: description of cases

Case 1: Midwifery Pooling (KNOV)

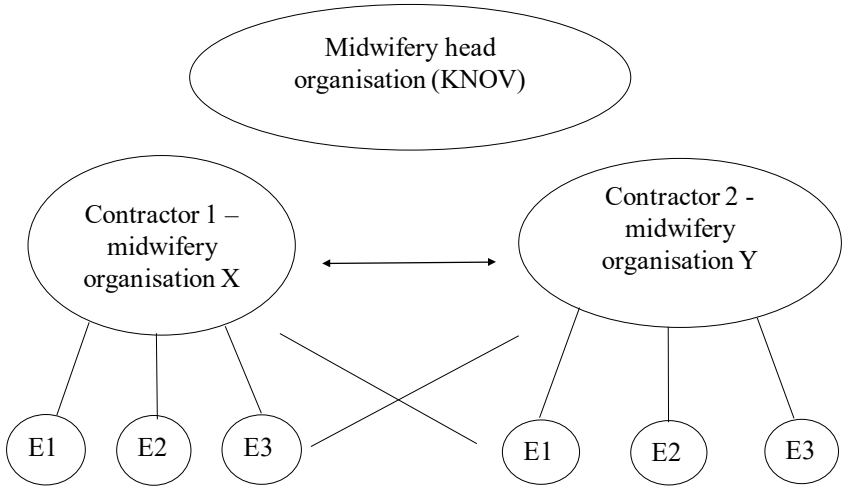

Figure 7: Illustration of case 1: midwifery pooling (planned)

Case number 1 is about the midwifery head organisation KNOV ("Koninklijke Nederlandse Organisatie van Verloskundigen"). KNOV is a Dutch organisation to support midwives in their job. It aims to deliver the best care for pregnant women, the (unborn) children and their families[9]. Currently, KNOV is assessing different opportunities to fight the capacity shortage problem. One of the opportunities is pooling, but the object of pooling still needs further investigation. The idea of pooling has existed for quite some time. Even before 2000, pooling was considered in different contexts and heard of. The pandemic now fastens the assessment of the pooling opportunity. Suppose pooling would be considered a good idea. In that case, KNOV will not be directly involved in the pooling process but will function as an observing and consulting organisation. Midwives or organisations employing midwives can ask them for support. Figure 7 shows the potential case illustration for KNOV. So, midwifery organisations X and Y would pool their personnel capacity, for example, for calls. They would potentially have contractual agreements between each other, illustrated by the horizontal arrow between contractor 1 and 2. KNOV would serve as an independent support organisation without a stable relationship with one midwifery organisation.

[9] https://www.knov.nl/over-knov, accessed 26/07/2022.

The interview partners of KNOV stated that the capacity problem increases the pressure on the midwives and the institution is hoping to decrease this pressure and increase the welfare of the midwives by pooling some tasks. Moreover, as opportunities, KNOV hopes for a lower threshold for people to call for example in the night, but also give midwives the possibility to specialise in their jobs and be more independent in the job design.

As the idea of pooling is still in the assessment phase, there are no contracting related challenges. But from experiences in their area, the interview participants stated, that other healthcare professionals stated that their and their clients satisfaction decreased due to a higher anonymity resulting from pooling. Even though pooling is not in practice yet, the participants of KNOV recommended a high stakeholder involvement in the pooling process to avoid resistance to the projects and to get any potential challenge on the table. For the near future, KNOV plans to create an overview internally regarding the opportunities against the capacity problem to see who can do what and how pooling could look like exactly for the midwifery organisations. Moreover, topics that are not in the daily work of a midwife as legislation and financing need consideration if pooling is considered worth a try.

Case 2: pooling of special tasks of nursing staff in home care (Manna & Zorgschakel)

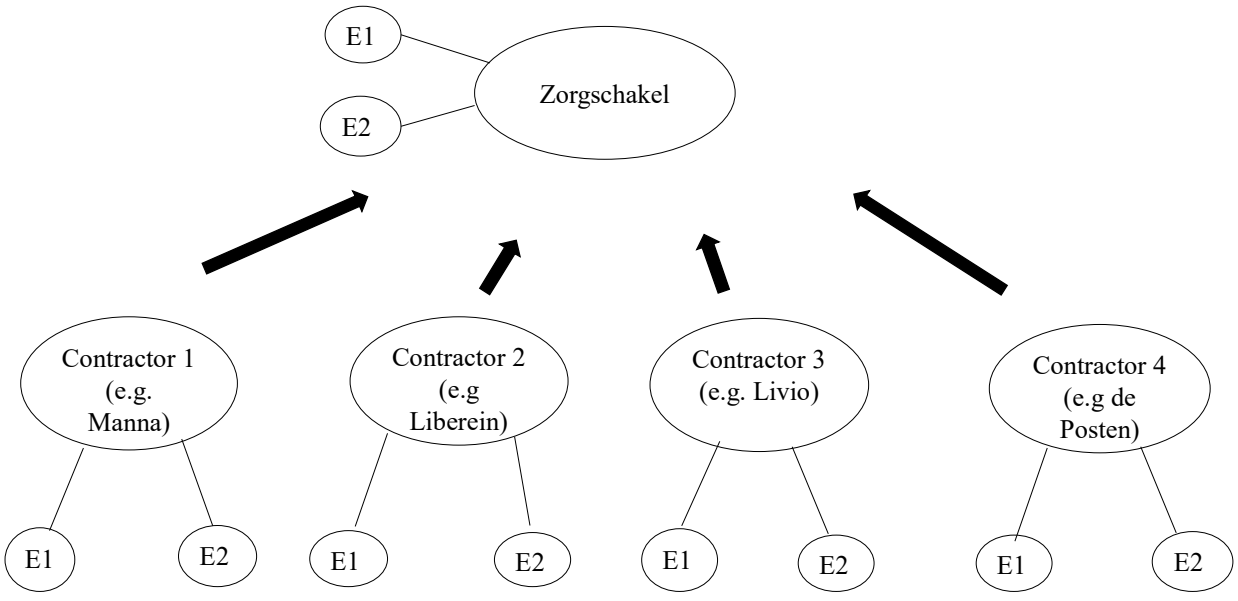

Figure 8: Illustration case 2: pooling in home care

Case 2 deals with the collaboration of four care organisations (Manna, Liberein, Livio, De Posten) in Enschede, which established one upper organisation (Zorgschakel) to deliver

high-quality care. Zorgschakel is responsible for particular care tasks such as complex wound treatment or medical-technical interventions[10]. Moreover, it has professionals in the front office and a pool in the night care. The collaboration has existed since 2016. In the beginning, specialised nursing staff from the four organisations changed their employers towards Zorgschakel to work in their special work, e.g. complex wound care. Nowadays, also external employees are searched for to fill up the teams.

In terms of contractual arrangements this means that Zorgschakel has its own nursing staff employed that is specialised for the kind of care they want to deliver, but the care is too specialised for "basic" care that the four organisations (Manna, etc.) can afford. The four care organisations established Zorgschakel as a new, independent organisation for special care. If one of them gets a request for special care or night care, they forward it to Zorgschakel and Zorgschakel organises the care. As shown in Figure 8, the four care organisations have their own staff (E1, E2), as well as Zorgschakel. This means that no staff per se is pooled. The thick black arrows pointing from each of the four care organisations towards Zorgschrakel indicate that Zorgschrakel emerged out of the collaboration of these organisations. Moreover, the board of Zorgschrakel consists of members of the four organisations.

The main objectives why Zorgschakel was set up were to make care more efficient by using the existing capacity more and by doing that decreasing the existing shortage of staff. Moreover, the project aims at delivering high-quality care to the clients. Zorgschakel and the four care organisations feel the pressure of the staff shortage. Covid 19 made things more difficult as the work pressure increased massively during the high time of the pandemic. Moreover, less people want to work in care, for example as a district nurse. Still, from the perspective of one of the four care organisations, pooling offers the opportunities to increase the efficiency of care and also makes it possible to share problems with other nurses you meet. From Zorgschakel's perspective, pooling can increase the convenience for the nursing staff. Taking the example of a night pool. Instead of, for example, having 15 people awake waiting for a call, you might have only four. Moreover, the set-up of such a cooperation

[10] https://www.zorgschakelenschede.nl/Over-Zorgschakel-Enschede/index.php/ , accessed on 20th of July 2022.

gives the nursing staff the feeling of belonging to one particular organisation. So, the employee satisfaction can be fulfilled. However, this project showed some learnings. For example, to begin with the equipment. It would be great to have standardised systems or information on how different systems work (e.g. IT systems or how to enter another building that is not familiar to the staff). Zorgschakel stated that it can be challenging to distribute the existing resources fair and equally among the organisations. Some work might be saved due to the pooling, but other things have to be done four times (e.g. invoicing). Regarding contracting, it was only stated that high complexity and an agreement about exchanging data with each other exist. As advice, the adjustment of the systems and the contact to Zorgschakel for practical terms are recommended. Moreover, a successful collaboration is based on cooperation and trust. As plans for the future, an expansion of pooling, be it a flex or talent pool, and making home care more efficient by using and involving technology and making the job as a nurse more attractive are stated.

Case 3: new education in children care – KinderThuisZorg & Beatrix Kinderziekenhuis Groningen

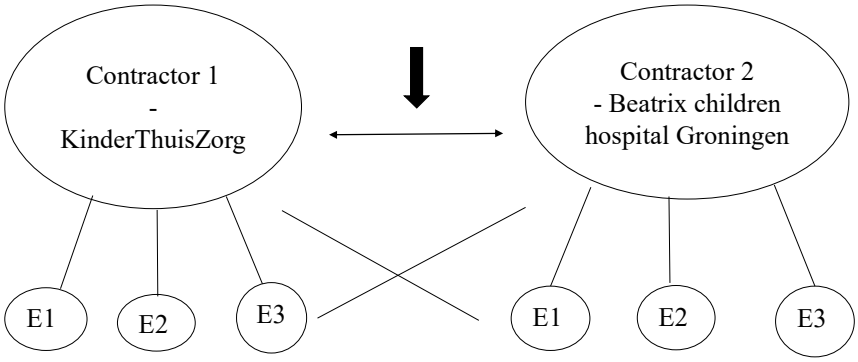

Figure 9: Illustration of case 3: pooling in children care

The third case describes pooling as a new way of educating nursing staff in the form of a collaboration between the children's home care institution KinderThuisZorg (KTZ) Nederland and the children's hospital Beatrix Kinderziekenhuis in Groningen. This project aims to improve the care for children in the North of the Netherlands[11]. About four years ago, a pilot started between two hospitals and KTZ to assess whether this kind of education would be helpful in the future. Now, the first transmural educated children nurses finished their education, and the following educations started. Today, the project is solely between

[11] https://kinderthuiszorg.nl/resources/cfiles/kinderthuiszorg_nl/downloads/Vacature-transmuraal-opleiden-maart-2022.pdf accessed on 14/10/2022.

the children's hospital and KTZ; the third party left the pilot. A transmural education implies a one-year education to specialise as a paediatric nurse. During the year, the trainee works in the hospital and at KinderThuisZorg. Usually, institutions such as the KTZ do not educate nursing staff themselves. The mixture in this education can help the trainees to decide where they want to work in the long-term or if they appreciate a mixture in their work environment and job design.

In Figure 9 it can be seen that KTZ and Beatrix children's hospital have a contractual agreement between them about the education. Namely, the arrow between the two contractors symbolises this contract. But, the trainees have an employment contract with one of the institutions. This means, E1 of KTZ is employed and paid by KTZ, while working in between in the children's hospital in Groningen. The thick arrow pointing at the contractual agreement signifies a potential issue as legislation that might influence the contract. For example, the interview partner stated that there are different pension funds existing. Therefore, in contracting, it should be clarified that these differences exist and how to address these.

The main objective to establish this way of educating nursing staff was to take a look at the future and keep staff in the sector while decreasing competition among healthcare providers because the interview partner observed that many people educated as nursing staff left the healthcare sector in total or left the hospital area to work in a care organisation as KTZ. The education to a nurse takes about six years, including specialisation as, for example, a paediatric nurse. Therefore, pooling is viewed as an opportunity to give employees the possibility to find out where they want to work and get to know different working environments. From the pilot of the transmural education some learnings can be drawn. One is that there are different retirement funds between different organisations. That is more to organise in the first place, but also might create a kind of competition in the long-term between the different healthcare providers if one retirement fund is financially better than the other. Another learning is to think and talk earlier about the future of the trainee in the education, giving the trainee a perspective about what comes next and which possibilities are there after finishing the education. Third, keep with what you said seems an important ingredient for a working collaboration. Regarding contracting, it needs to be said that there are collective labour agreements (CAO = collectieve arbeidsovereenkomst) existing. The interview partner recommends creating additional value for the educated employees and also

to think about incentives. Moreover, it seems important to make people feel belonging to a group. In the future, more projects and experiments might be taken to create the future of nursing staff.

Case 4: Software support in pooling

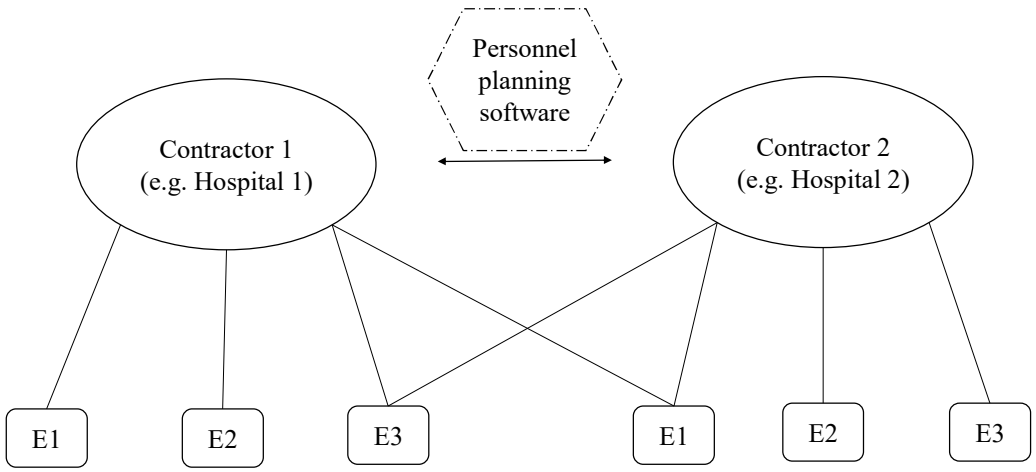

Figure 10: construct of case 4: software support in pooling

Case description

This case is not a real case per se, but opens possibilities and shows up potential in the integration of software in a personnel planning process in general and the pooling process more specifically. The interview partner was a manager of Intus, a company that develops software as a planning tool for healthcare organisations, like hospitals, elderly care or disabled care. The interview partner had experience in pooling internal personnel resources, meaning using existing personnel more efficiently and in different departments. Sometimes, external staff from agencies was requested. The experiences came from the work in a care organisation. Now, the interviewee works at Intus as a manager for the healthcare institutions and combines insights from the former job with requests for a personnel planning tool. The software Intus develops is leading in the customers from the healthcare sector. This software can help to plan and pool resources for optimal use of staff capacity in order to reduce costs of healthcare and the use of agencies.

Error! Reference source not found. shows a potential pooling case. This is not a real-life case, but based on the insights of the interview. For example, assume two hospitals decide to pool their nursing staff. With help of a personnel planning software, the employees that

are in the pool can all access, e.g. via their smartphones, the software, choose their shifts, get a notification when a shift is unsolved. The software is able to only notify the people that fit the requirements (e.g. legislation or regulations as CAO or company rules). For example, the software can check if the nursing staff has enough hours left, the right qualification and if he or she worked already at the location. Moreover, the software is able to check the legislative regulations and start the payment calculations. It could also be that the pooling participants have separate systems, but it is possible to connect them via a software.

Opportunities of pooling are, according to the interviewee's opinion and experience, the empowerment of the people, automatisation and the use of technology, and the connection and collaboration with other institutions using the same (or other brands of) software. But it was also realised that pooling is not the sole answer to all problems. Also, there might be resistance of the staff against technology. If that is the case, the stakeholders need to be closely involved and educated. Regarding contracting, a collective labour agreement can play a role with the use of technology. But, tax regulations and payment policies need to be checked carefully upfront. As an advice, the interviewee named stakeholder involvement and discovering the people willing and suitable to work in an internal flex pool. And, of course, consider the use of software to make planning easier and more efficient. Intus plans to expand the use of software in other areas and countries.

Case 5: current projects from de Rotterdamse Zorg

De Rotterdamse Zorg is a network organisation that takes care of questions regarding personnel, as now in times of staff shortage, and facilitates and supports organisations with problems like that. At the moment, there are three projects in the area of Rotterdam with focus on hospitals. The aims of all these projects are, first, to reduce the staff shortage, and, secondly, to bind existing staff to the region as it was noticed that people leaving the region or even the healthcare sector. De Rotterdamse zorg looks for collaboration instead of competition between the hospitals. The three projects, which are somehow related to pooling, how exactly is explained later on, should help against the staff shortage, decrease the use and therefore the costs for agencies. It should increase the quality of care and open the door for a modern way of working for the nursing staff as employees nowadays potentially look for more autonomy, a better work-life balance, etc. However, high complex organisational structures and many challenges that might appear along the way can be hurdles to pooling. If someone needs help with pooling or setting up a project in that

surrounding, it might help to contact de Rotterdamse zorg and ask for advice. Also, to remember the motto of collaborate instead of compete and listing to the employees can help. In the future, de Rotterdamse zorg is planning to expand current projects and start new projects.

Now, coming to the three projects that are related to regional personnel in hospitals. The first project is about regional exchange, meaning nursing staff working in the surgery area can do for a few weeks a "traineeship" in another hospital in the region. During this time of three to five weeks, the nurse can learn about processes in other hospitals and take insights back to the home hospital. This project aims specifically to keep and bind employees to the region ("boeien en binden van de medewerker"). During the time of the exchange, the employee is still employed and paid by the home hospital. Between the hospitals exists an unpaid loan agreement. This case is comparable to Figure 1.

The second project is about a joint procurement of personnel between hospitals in Rotterdam and Den Haag. This means, medical staff is hired from agencies. The hospitals are dependent on these agencies. But as agencies are very expensive, the projects aims at reducing the costs by purchasing collectively and getting discount on the "volume" that is purchased. In 2022, the price increase country-wide was 10%, but in the joint procurement only 3% because of the high volume and tough negotiation. This project runs for about 8 years now. The joint procurement has a framework agreement for the agencies. The illustration can be found in Figure 11.

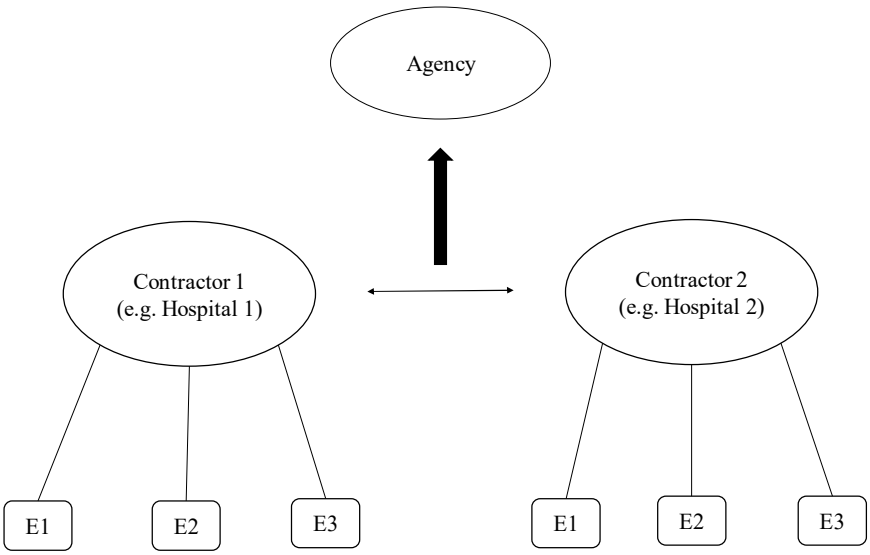

Figure 11: project 2 - De Rotterdamse Zorg

The third project is the answer to a new legislation coming up for self-employed medical staff (ZZP = zelfstandige zonder personnel). The project "workflow" offers ZZPers a zero-hours contract with a hospital. So, they can choose when and where to work, but they have the advantages of a fixed work engagement (retirement fund, insurance, etc.). Further information can be found on https://deworkflow.nl/. In this project, a cooperation agreement between the hospitals exist to be able to offer the ZZPs high work flexibility. This project is comparable to the illustration of Figure 12.

Case 6: pandemic unit - 3 hospitals intend to share their ICU nursing staff – insights from Acute Zorg Euregio (project leader)

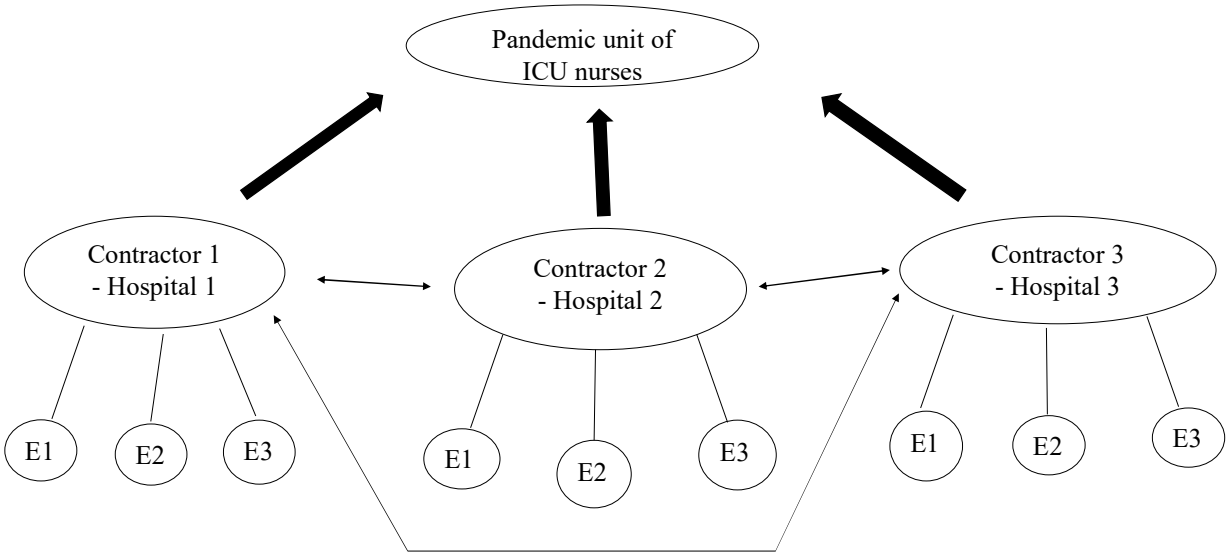

Figure 12: Illustration of case 6: potential pandemic unit in three hospitals

The last case found from the interviews tells the story of Acute Zorg Euregio (AZE), which is a network organisation to facilitate health, support healthcare institutions to implement new regulations and find solutions to challenges, such as the shortage of nursing staff in the East of the Netherlands. Currently, Acute Zorg Euregio is assessing the opportunity of pooling staff between three hospitals in Almelo, Enschede and Winterswijk in form of a pandemic unit. Figure 12 shows the illustration. This would mean that only one hospital would have, in the current pandemic, Covid patients and intensive care units (ICU) nursing staff taking care of the patients. With bundling patients and nursing staff in one hospital, AZE is hoping to make care more efficient, to be able to take care of more patients and being able to provide the standard care. This was not always possible during the pandemic. Back

then, surgeries had to be postponed to have more capacity for the Covid patients. In February 2022, the idea of a pandemic unit emerged. Originally, it was aimed to have such a unit set up and in practice in September 2022. But because of partially unforeseen challenges, the project was in October 2022 still in the assessing phase, with an unknown outcome. One challenge that was expected was resistance by the nursing staff. But it turned out that the resistance is stronger and more effort to convince is needed. Another challenge AZE came across is: what does the pandemic unit do when there is no pandemic? To find out if the set-up of a pandemic unit has the desired outcome, a simulation is developed until November/December 2022. Based on that outcome, the idea of pooling will be further assessed or turned down. As this project is still in the assessment phase, no insights on contracting were given by the interviewee. But if pooling is an opportunity, the three hospitals would need a contract that covers challenges as the instable demand.

If the outcome of the simulation model shows significant impact of pooling, the pooling illustration could look like in Figure 12. So, all three hospitals put employees in the pool for the pandemic unit and might have contractual agreements between each other. They gather staff in one unit together to use it for the pandemic care. Therefore, the exchange is in one direction at one moment in time. AZE hopes, if the effect calculated by the simulation model is sufficient, to stimulate the cooperation between organisations and achieve a better understanding among organisations regarding the work environment and circumstances. AZE recommends to advertise the benefits of pooling more. For the future, the assessment of the pooling possibility will be finished and other projects to fight the staff shortage and other problems are started.

4.3 Cross-case comparison

This sub-chapter compares the cases that emerged from the interviews regarding the themes established from the analysis. Appendix 3 shows the codes and categories found in the interviews with the participants. The themes relevant for the guidance in the end are expectations towards pooling and experiences with pooling**. Expectations** towards pooling imply the objectives, so what did the participants hope to achieve from pooling? Additionally, the expectations include the pressures the participants face and the opportunities they see from pooling. Most participants agree that pooling can help to reduce the existing staff shortage and use the existing staff more efficiently. The *difference between*

objectives for pooling and *opportunities of pooling* is that the objectives point towards the goals that the pooling participants want to achieve (e.g more efficient use of existing staff), while the opportunities want to find advantages (e.g. stimulate cooperation) that participants hope to find from pooling. However, sometimes, there are overlaps in what participants want to achieve and which advantages they hope for. **Experiences** with pooling entail learnings from pooling, as the high complexity of the pooling idea. Furthermore, it advises future pooling participants, for example, to involve all the stakeholders in the process. The *difference between learnings and advice* is that learnings are the concrete issues the participants ran into and how they solved it (e.g., staff resistance), while advice looks at others that want to pool and what the participants would do and consider in their case (e.g. advertise benefits of pooling more). Contracting-related challenges such as tax regulations and financial aspects also count into the experiences.

Table 2 summarises the cross-case comparison. According to the insights of the interview partners, the pooling of resources is most often viewed as an opportunity against the staff shortage while using the existing staff more efficiently. It also should help to stimulate collaboration between healthcare organisations. The immense pressure of staff shortage is one reason for pooling participants to even consider pooling. Additionally, new upcoming regulations and high healthcare costs are starting points to consider pooling. The opportunities of pooling are among the cases more diverse than the objectives and pressures. While some see a chance to increase employee empowerment by pooling, others hope to gain standardised processes, better cooperation between organisations and decreased costs for agencies (cases 5, 2 and 6). These perceived opportunities of pooling might impact the set up of SLAs in the specifications. Future pooling parties could, for example, write down in the SLA how exactly the employees could be empowered, which processes need standardisation and how standardisation should be conducted. Moreover, the pooling parties can think of how they measure if the employees are more empowered and what the impact of standardised processes are. This could be done by KPI and surveys among the staffed employees regarding their opinions and impressions. An improved cooperation between organisations can be noted down in a SLA as an expectation. If the cooperation was improved could be measured by regular meetings and surveys regarding the opinions of the involved human beings, but also numbers could indicate if the cooperation is better. For

example, if pooling parties note an decrease in costs, this could indicate that pooling has the aimed effect.

Regarding the experiences with pooling, the learnings vary across the cases. Case 1 assumes that there might be greater anonymity when pooling midwives. Anonymity might occur because if midwives are pooled, there might be more frequent changes in staff for the clients which might lead to the fact that the midwives are not as familiar with the pregnant women as they are now and vice versa. Others experience difficulties with non-standardised processes in everyday clinical working practices between pooling parties (case 2). Moreover, there could exist matters of employment conditions such as differences in regulations of pension funds (case 3). Also, pooling is perceived as complex and not the only solution to the staff shortage problem. The complexity is underpinned by the experiences of case 6. Case 6 is still assessing the potential of pooling and ran into massive problems in this phase because the staff that is intended to be pooled resists and doubts the positive impact of pooling more than expected. This implies that managers of the pooling participants should be sensitised in soft skills and listen to the doubts and arguments of the staff. This could also be a part of a SLA, for example by stating that regular meetings are offered where staff can share experiences and issues and present ideas on how to solve these.

Regarding the tips that the interview partners gave as advice for others or own future projects, cases 1, 4 and 5 agree that stakeholder involvement is crucial for the success of pooling. The advice of cases 2 and 3 support that direction through relational matters such as collaboration, trust and incentives for the employees. Case 6 recommends advertising the potential benefits of pooling more from the beginning to give the stakeholders a better feeling. Regarding the contracting-related issues, the insights are limited as some cases did not yet reach the contracting phase or have nothing to share. Nevertheless, case 2 highlighted the complexity of contracting regarding the different interests of the parties and points to fair resource allocation. Case 4 mentioned the potential existence of differences in regulations. Case 6 assumed that financial issues would appear once the contracting phase is reached, which is supported by case 4.

To sum up, across all cases, there is consens about stakeholder involvement, the importance of relational aspects such as collaboration and the problem of staff shortage in healthcare. Also, the individual nurse's role seems essential to consider and to treat the staff fairly.

However, contracting as such was rather neglected and did not seem to be of high importance to the participants in pooling even though pooling cannot be conducted without an contracting agreement.So, there were little insights directly connected to contracting. However, conceptualisation brings up potential challenges and impacts (see 5.3).

Table 2: Cross-case comparison by themes emerged from interviews

		Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Expectations toward pooling	*Objective for pooling*	Opportunity against capacity problem	Increase efficiency of care, deliver high quality care	Collaboration between healthcare organisations	Reduce costs of healthcare and use of agencies	Collaboration instead of competition	More efficient use of capacity
	Pressures	Staff shortage	Staff shortage	Education duration of nurses	Staff shortage, high healthcare costs	New regulations	Not said
	opportunities	Standardised forms	Increase efficiency of care	Employee empowerment	Empowerment, use of technology	Decrease costs for agencies	Stimulate cooperation between organisations
Experiences with pooling	*Learnings*	Possibly higher anonymity	Standardisation of processes can support pooling process, equal resource distribution is challenging	Differences in retirement funds	Pooling is not the one solution	High complexity of pooling	Higher resistance of staff than expected
	Advice	Stakeholder involvement	Cooperation and trust as basis for successful collaboration	Create value and incentives for employees, feel to belong to a group	Stakeholder involvement; consider use of software	Collaboration instead of competition; stakeholder involvement	Advertise benefits of pooling more
	Contracting -related challenges	Not said	Complexity	Not said	Different regulations (e.g. tax); financial issues	Not said	Financial aspects

4.4 Insights from contracting expert interviews

This part of the results chapter presents the insights from the interviews with experts. The interview partners and their expertise can be found in Table 3. All the interview partners have an academic background and are passionate researchers. A few of them, 2 and 3 for

example, have also practical expertise as they are or were working in companies and researching. At first, general insights per experts are described, afterwards a pair-wise comparison is conducted with emerging themes.

Table 3: experts and expertise of interviews with experts

Expert	Expertise
1	contracting, joint procurement
2	HRM, job design
3	joint procurement, contracting, social care
4	purchasing
5	service level purchasing, contracting in healthcare

Insights per expert

Next, the insights per expert are presented.

Expert 1

Expert 1 has joint and public procurement expertise, works at a University and conducts research on contracting. Looking at the case model (Figure 1), he assumes that trust could be an issue in the set-up phase of the contract and therefore needs special attention. One possibility to solve a trust issue is with the help of non-disclosure agreements (NDA). In the pre-contracting phase, the potential of joint procurement should be assessed if looking for a joint procurement collaboration for a product or service. So, what value adds the joint procurement to the company? This can be a scale or knowledge advantage. Once a contract is realised, evaluation of the contract is necessary. Expert 1 recommends having regular meetings to discuss how business is going and measuring performance with the help of KPIs. Imagine hospitals jointly procuring the service of catering. If hospital 1 has a problem with the caterer, but hospital 2 is ok with the performance, solely hospital 1 discusses the issues (could be performance or quality related) with the caterer. As a solution, the caterer could develop an improvement plan to avoid fines. Otherwise, the hospitals can use incentives to motivate the caterer to provide the best service. According to expert 1, challenging could be the preparation phase of the contract. Especially the negotiations are crucial. Here, the parties should openly share issues and opportunities they see in the collaboration. As an advantage, joint procurement can lead to decreased costs and increased quality.

Expert 1 mentioned a real-life experience with the joint procurement of a heart device. The procurement staff were convinced of the use and quality of one specific product. But, the stakeholders who should work with the device stated they wanted the same brand again, even though the new device would have the same features and functions, just a different name and price. To resolve the issue and convince the stakeholders of the advantage of the new device, experienced people shared their experiences with the stakeholders. It helped; the people were in the same position as the doubting stakeholders and seemed more believable than procurement officers. Therefore, as a learning from that example, expert 1 recommends getting all stakeholders at one table.

Expert 2

Exper 2 is a professional in HRM. He combines theoretical with practical insights as he works as a professor at a university, but he also worked in consulting and as an entrepreneur. Expert 2 shared insights about labour flexibility. In the best case, it happens to match needed with available capacity while keeping up or increasing the quality of a product or service, reducing the costs and discovering innovation possibilities. Companies might evaluate if they want solely full-time staff from own company or one part from agencies or if they can exchange human resources with other companies. Difficulties with pooling could be the seasonality in some industries with an inconsistent demand, so what to do when there is no break or no demand. Next, trust could become a problem in pooling. If companies exchange human resources, how could they be sure that every party treats the others fairly? Another issue might be costs and payment regulations. Payment might be interrelated with seasonality because it needs to be clarified who pays for the pool when it is not needed.

Expert 2 recommends building scenarios to calculate potential outcomes and optimise these. For the healthcare sector, scheduling the workers might be doable with the help of technology. Technology is already used in elderly care or disabilities or long-term care with sensors, buttons and night care monitoring. Regarding the staff shortage, expert 2 insists on attracting and keeping people to the healthcare sector. This could be done by reducing the work pressure and the administrative burden. Job crafting could give healthcare workers freedom in deciding when to work in a flexible way to increase, for example, work-life balance. It is essential to consider for pooling human resources in healthcare that the

exchange is voluntary. The workers need to be able to decide actively to do pooling instead of being forced. According to expert 2, this plays an important role in the staff's motivation.

Expert 3

Expert 3 has proficiency in social care and contracting. Social care is dealing, among others, with elderly care or mental health. He is researching how to pay for healthcare and which innovations and incentives can support that. For example, he talked about the fee for service. Imagine you go to a dentist, and the dentist recognises you have a cavity in your tooth. Then you pay for the drilling and filling, but not other fees. So, purely for the service of repairing your tooth. There are other ways of payment. For example, outcome or value or volume-based.

Regarding pooling, expert 3 thinks that trust and consciousness play an important role in contracting. It needs to be clear what is contracted about. Moreover, the relationships between the parties to each other should be clarified. So, are they competitors? This could lead to a clash of interests. These interests should be openly addressed in the pre-contracting phase. Suppose the parties are interested in fostering innovation. In that case, they should probably remain with broad descriptions of how a service is bought. If the functional specifications of a product or service are very detailed, this could hinder innovation. As advice, the goals and benefits should remain attainable for all parties. This could be done with the STAR method. A gentlemen’s agreement could be one way to deal with trust issues.

Expert 4

Expert 4 has extensive knowledge in purchasing and related matters. Current trends noticed in the labour market across many domains is that generation z changes jobs more often, looking for a flexible working environment to gain more differentiated experiences. Regarding tendering, for example, Dutch hospitals have to follow specific guidelines. There is a shift realised in hospital procurement from intramural to extramural (so the municipalities or other organisations have to do the purchasing). Another interesting development going on is Industry 4.0 (I 4.0). It describes the autonomous communication between machines. As an example, autonomous driving cars are probably the most known examples. Since the development of I 4.0, new job roles in procurement have occurred. Expert 4 concentrates on the future, developments like the world population need

consideration, as well as the development of healthcare and how to deal with issues such as the capacity shortagee.

Expert 5

Expert 5 has know-how on contracting between organisations based on performance and cares about the resilience and sustainability of supply chains. Asked about the model (Figure 1), he indicated that in the United Kingdom (UK), there are different regulations for private and public hospitals. Regarding experiences during the Covid-19 pandemic, he talked about the shortage in medicine supply. As a solution, hospitals tried to create stocks, even though public hospitals usually are not allowed to do so. However, in the case of the pandemic, regulations were flexed. Regarding pooling, expert 5 explained that in the UK, hospitals are not allowed to exchange resources with each other, which is a constraint in the system. The idea of risk pooling is typical for industries with high demand variability. So, instead of five warehouses, a retailer might only have one central warehouse with stock to be more flexible.

As the most important to consider while contracting, expert 5 stated the specifications and the contract design issues that might arise. For example, there might be concerns about payment agreements, risk allocation and management, risk sharing and performance. Risk management should clarify what to do if someone exchanged makes a mistake and who is responsible or liable. Regarding performance, the term performance needs to be defined. Indicators should be set up to monitor the expected performance level. As contractual agreements, a framework agreement or a resource-sharing agreement could be set up. Expert 5 pointed out that in this research context, the participants in pooling might be viewed as partners instead of competitors. Hence, it is a horizontal relationship instead of a classical buyer-supplier relationship.

4.5 Pair-wise comparison of experts

During the pair-wise comparison, similar and unique views between the experts are reviewed to find interesting strings of thinking from different expertise.

Similarities

The similarities between the insights of the experts are shown in Table 4. The x in the table means no value, as it is not possible to compare Ex1 with Ex1. In the fields where a

comparison was possible, summarising keywords are used. “Nothing found” indicates that no similarity exists between the two experts. Ex1 and Ex2 agree that **trust** is an essential element for success in a contracting partnership. Ex3 shares the view of trust with Ex1, and they both think incentives need to be written down and included in contracting to motivate each other. There were no similarities found between Ex1 and Ex4. Ex1 and Ex5 show similarities regarding performance issues, the definition of performance and the use of KPIs and incentives. They both think that the topic of **performance** needs to be defined and included in a contract because it helps clarify the expectations of each contracting party involved. It helps to avoid problems as one party cannot deliver the agreed amount of people to the pool. What to do in this case could be something to think of during the contracting phase, agree on a solution, and write it down.

Ex2 and Ex3 mentioned the potentially contentious issue of **payment**. If it is about money, problems and disputes can arise. Therefore, a contract can help to clarify what to pay when and to who and what to do when someone cannot pay. For example, thinking of one of the cases above, the solution could be that each pooling party employs some of the staff in the pool and pays them but also gets employees from other participants without paying them because they constantly pay their own employees even when they are working at the other pooling party. Ex2 and Ex4 both mention the current trends in work, especially with younger people, as employees looking for a **flexible work environment and more autonomy in the job design**. Moreover, they agree that the role of technology in HRM increases and there is a lot of unused potential. Ex2 and Ex5 state the importance of **risk allocation** in contracting. Additionally, the exchange **staff's education** needs clarification in the contract to prevent irritation and insecurity and increase the quality of the work done in the exchange stations.

Ex3 and Ex4 bring the potential of **innovation and developments** as Industry 4.0 (I4.0) to the table. They agree that there is a lot of potential in these developments and chances **to make life for healthcare professionals easier**. Ex3 and Ex5 underline the use of incentives and opportunities for innovation. But, they both mention the importance of **risk management** to avoid disputes. Ex4 and Ex5 match in their opinion that there might exist different regulations for private and public hospitals.

Table 4: similar views of experts

Similarities	Ex1	Ex2	Ex3	Ex4	Ex5
Ex1	x	**trust** essential for success	incentives; trust;	nothing found	performance issues, performance definition; KPI; incentives;
Ex2	x	x	payment issues;	flexible work environments and job design; increasing role of technology	risk allocation; education of exchanged staff
Ex3	x	x	x	innovation and I4.0	incentives and opportunities for innovation; risk management
Ex4	x	x	x	x	Regulations for public vs private hospitals
Ex5	x	x	x	x	x

Unique views

Unique views are opinions and insights of the experts that seem to be very important to them and that were strived and underlined during the interview multiple times. Table 5 summarises the views of the experts. Expert 1, for example, said that joint procurement is an opportunity, but the insights are more from a classical buyer-supplier relationship in the procurement of products and services than human resources. Moreover, expert 1 recommends to spend sufficient time on the pre-contracting phase to identify the interests and expectations of the parties, gain trust and figure out details. Expert 2 is into job design and underlined the importance, especially nowadays. Expert 3 emphasises the value-based and outcome-based contracting as possibilities to pay for healthcare. Expert 4 stresses to concentrate on the future: how will healthcare look like in the future? And take into account the developments as Industry 4.0 and new roles emerging from that. For example, new job role in purchasing that did not exist 20 years ago is the role of a data analyst. Expert 5 highlights the importance of the resilience of a supply chain. Especially the Covid-19 pandemic pointed out how important the resilience is, independent of the sector (industry vs healthcare). Additionally, expert 5 accentuates the role of the contract design, which gives space to any issue that parties consider worth in setting it up in the contract.

Table 5: Unique views of experts

	unique point of view
Ex1	joint procurement as an opportunity; importance of pre-contracting phase
Ex2	job design
Ex3	value-based and outcome-based contracting
Ex4	I 4.0, new roles, new jobs; future: what comes next in healthcare?
Ex5	resilience of supply chain; contract design

Summary and themes form expert interviews

Appendix 4 summarises the themes that emerged from the codes of the expert interviews. The themes relevant for the artefact are human resources related, barriers of pooling, success factors of pooling and contracting-related items. The **human resources related** theme implies the job design that nowadays requests a flexible working environment. **Barriers of pooling** include findings regarding instable demand for resources due to seasonality, but also the lack of trust and thoughts about financial topics and organisational issues as quality of predicitons. **Success factors of pooling**, according to the expert insights, are relationship-related and address the communication with stakeholders and the trust between the contracting parties. Specifications, contracts and issues of contracting are all parts of **contracting-related elements** that the experts named.

5. Discussion

This chapter brings together the insights from the cases, the expert interviews and literature. The insights are analysed regarding alignment and new findings from the cases and expert interviews. Moreover, the implications of these insights regarding contracting are presented. In addition, the Make-or-Buy approach is further analysed and connected with the topic of contracting in staff pooling. At the end, a checklist is developed, serving as a guide for future pooling participants.

5.1 Comparison literature review with insights of cases and experts

Alignment

The following explanations refer back to the barriers of pooling found in literature, presented in Figure 3. As suggested by Elferink (2022), Good & Bishop (2011) and van Krugten (2022), the staff needs **motivation** to be willing to work in a flex pool. The participants agree with this view and stated that the lack of motivation of the staff can break a whole project. As stated by Acute Zorg Euregio, for example, there is extra effort needed to convince the nursing staff of the use of pooling. For example, if the outcome of the simulation model that Acute Zorg Euregio is currently working on indicates that staff pooling has no significant effect on the efficiency in the workforce, the doubts of the staff would be reasonable. Therefore, it is also useful to assess the effects thoroughly upfront a project.

Also stated in the literature and in the interviews was the **fear** of the nursing staff **to not belong to a team anymore** (Good & Bishop, 2011 and van Krugten, 2022 and interviewee of Manna and Zorgschakel). The feeling to belong to a team, like a family, seems critical to the nursing staff as a motivation. Third, van Krugten (2022) and interviewees as Manna mentioned the problematic of different equipment and medical terms. The interview partners of Manna support a standardisation of IT systems, for example, in order to make it easier for the nursing staff to adapt to the new situation.

Van Krugten (2022) observed that necessity of fast adaption to the new working environment as well as a success factor for pooling. Host Healthcare (2022) and KNOV agree that the **use of different protocols and practices** to approach certain tasks can be a barrier to pooling. Therefore, standardisation in this matter is preferred. Standardisation can help here because

it would be easier for the nursing staff to adapt to new working environment. For example, if a nurse works with the same IT system at all her working places in the pool, he or she will feel more confident about the pooling. Therefore, standardisation could increase the interest of nursing staff in being pooled once it can be guaranteed that they do not have to learn a new system every time they are at another working place. It could happen that in the beginning, a training is needed to get everyone of the pooled staff on the same level on the use of the system. As another example, the standardised use of protocols can also help medical staff to feel comfortable with pooling because they do not have to fear to make a mistake during diagnosing.

Literature highlighted the factors **quality, performance and payment** that need clarification before setting up a contract (Cousins et al., 2008; Monczka et al., 2010). This was stated by all experts, except Ex4. Broekhuis & Scholten recommended to **clarify expectations, capabilities and interests** upfront, which was confirmed by Ex1, 2 and 3. Abbasi et al. (2020) found the importance of fair **resource allocation** in industry. Experts as expert 1 and 2 pointed to a potential trust issue because of doubts in fair resource allocation by the pooling participants. Table 6 summarises the comparison.

Table 6: aligned views of literature and interview partners

Confirmed views	**Literature**	**interviews**
Quality, performance, payment	Monczka et al (2010) Cousins et al. (2008)	Ex 1,2,3,5
Clarify expectations, capabilities and interests upfront	Broekhuis & Scholten (2018)	Ex 1, 2, 3
Fairness in terms of resource allocation	Abbasi et al. (2020)	Ex 1 and 2
Motivation of staff	Elferink, 2022, Good & Bishop, 2011 and van Krugten, 2022	Manna, Acute Zorg Euregio
Missing to belong to a team	Good & Bishop, 2011 and van Krugten, 2022	Manna, Zorgschakel
Different equipment and medical terms	Van Krugten, 2022	Manna
Different protocols and practices	Host Healthcare, 2022	KNOV, Manna

New findings from interviews

Additionally to the confirmed suggestions of the literature, the interview partners stated the **importance of stakeholder involvement**, suggest **the use of technology** and software and

highlight the existence of different **regulatory hurdles**, such as the presence of different retirement funds.

In addition to the overlapping findings from the interviews, expert 2 also set a focus on inter-personal connections related to **trust**, while Expert 5 highlighted to **importance of risk management and allocation**. Interestingly, the need for schedules found in literature was not confirmed by any of the experts. The implications regarding contracting of these findings are further explained in the guide in 5.3.

Connection to make-or-buy approach

Applying the findings of the study to the **make-buy approach**, it can be assumed that the objective and opportunity to decrease the use of agencies could indicate a trend towards make instead of buy. As stated in the literature, the make-or-buy approach helps a company to consider whether to produce a product or service themselves (make) or give it to someone else (buy). Transferred to this research, it seems, with the insights of the cases in mind, that pooling institutions look to **make** instead of buy. Make in this context, means healthcare institutions hire the nursing staff themselves. In contrast, buying means contacting a nursing agency to provide extra staff. The pooling parties seem to keep the staff as close as possible to them by providing the nurses with more empowerment, incentives and job design opportunities. However, because there is a shortage of staff, in some cases, it is not fully possible to exclude agencies from the process.

Looking at the transaction cost economics theory (= costs to plan, adapt or coordinate an exchange), an asset specificity in the transaction characteristics can be found. The human asset specificity is essential here because, in the example of pooling resources, the investment in the nursing staff increases independent of make or buy. The human asset specificity increases with make because the healthcare institutions put extra effort into some of their staff to pool them. Extra education is necessary to adapt quickly to the new work environment. In buy, the asset specificity increases as well because the agencies are requested to hire staff that potentially also needs education in the healthcare institution. However, I assume that the asset specificity is higher with make because the healthcare institution has to put extra work in convincing staff of pooling, educate the staff, contract staff differently, etc. Interestingly, Williamson 1991 (quoted in Cousins et al., 2008, p.33) stated that the transaction costs for the make and buy increase if the asset specificity rises.

However, it increases more for buying than for making. Therefore, healthcare institutions could consider making it instead of buying as the less costly decision, even though it seems to be much extra effort.

Regarding the resource-based view, healthcare institutions can guide themselves through the capability questions. For example, they could ask themselves if they can set up a pool directly or develop the capabilities necessary to develop a pool. If the answers to the questions are yes, they should decide to make instead of buy. Consequently, the institutions consider pooling resources make instead of buying their personnel.

5.2 Summary of themes emerged from interviews and sources of insights

To create a guidance from the insights I gained in the interviews and literature,

Table *7: summary of themes, sub-issues and sources of insight on what to consider while contracting in pooling personnel* summarises the main points and sources. This table shows in the most left column the main themes found from literature and interviews, namely **barriers** to pooling, **success factors** to pooling and **contract design** related elements. Next, the sub-issues are labelled and further elaborated. The sub-issues underly the main themes. For each main theme, there are at least three sub-issues presented.

There are several sources of insight, namely make-or-buy or agency **theory**, **literature** on **pooling**, literature on **contracting**, the **cases** evolved from the interviews with pooling participants and the insights of the **experts**. In the right part of

Table 7: summary of themes, sub-issues and sources of insight on what to consider while contracting in pooling personnel, the sources of insight are shown. For example, in the barriers section, the **lack of good communication** is a sub-issue and it is supported by the literature on pooling and the cases. Literature on pooling found in a recent research (van Krugten, 2022) the lack of good communication as one barrier to pooling. And also the experts (e.g. Ex2) highlight the importance of communication with the stakeholders. The sources of insight vary between two and three sources per sub-issue. One example for two sources of insight is the topic of **risk allocation**. Ex5 named risk allocation and literature on contracting talked about liabilities. The terms are different, but Ex5 also viewed liabilities as one part of risk allocation.

This table shows which issues are on which peoples' agenda. Therefore, it goes with the spirit of highlighting issues which pooling decision makers should be thinking about, but may not be doing so. Moreover, it gives at one glance a summary of themes and sub-issues to consider. In a next step, the guide is introduced and the connection (and therefore the value of this research) towards contracting is given.

Table 7: summary of themes, sub-issues and sources of insight on what to consider while contracting in pooling personnel

Main theme	Sub-issue		Theory	Lit on pooling	Lit on contracting	Cases	Experts
Barriers	[label]	[elaboration]					
	Resistance of staff	Lack of motivation can lead to failure of pooling		x		x	
	Lack of trust	a lack of trust means that pooling particpants are suspicious against their partner. Leads to failure and misfit in relationship	x				x
	Lack of good communication	a lack of good communication means either to not listen well to what someone says or to not sharing clearly the wants and needs. Leads to misunderstandings, hidden interests		x			x
Success factors	Stakeholder involvement	stakeholder involvement means Including anyone affected by pooling into the process				x	x
	Use of technology	To increase standardisation and digitalisation				x	x
	Job design	the amoung of autonomy in designing the tasks and shifts in the life of nursing staff		x		x	x
Contract	Payment	payment regulates Who pays who and when?			x	x	x
	Quality	How to assure high quality of care?			x	x	x

	Performance	How to measure performance?	x		x		x
	Risk allocation	How to allocate risks between pooling participants? Who is when liable for what?			x		x

5.3 The Guidance

This sub-chapter introduces the actual guide developed from this research. At first, a general introduction to the guidance is given, telling why one should read it and what it should provide to the reader. Second, the different themes emerged from the interviews and literature review are introduced and connected to contracting in a table.

Introduction

The primary audience for this guidance are healthcare institutions assessing or considering the pooling of personnel. Below you will find suggestions on what to consider to get a useful agreement between pooling parties. The suggestions are based on a literature review and interviews with participants in pooling and experts in contracting, HRM or purchasing.

Ingredients for effective contracting for pooling

The table below shows the different themes and sub-issues of pooling and how contracting addresses the different issues. Institutions planning to pool in the future should assess for their case if they, for example, involve all stakeholders and gain the trust of the different involved contracting parties. It is then explained how contracting can help gain trust or why it makes sense to involve all stakeholders as the contract can collect many points in it, preventing potential issues upfront.

Main theme	Sub-issue		connection to contracting
Barriers	Resistance of staff	Lack of motivation can lead to failure of pooling	Contracting can address the lack of motivation by writing down in the contracts between pooling parties to offer benefits for the staff, e.g. incentives as trainings, monetary terms

	Lack of trust	a lack of trust means that pooling partners are suspicious of each other. Leads to failure and misfit in relationship	Contracting can help to gain trust between the managers of a pooling arrangement by negotiating very openly and share opinions and agree on regular meetings to build trust
	Lack of good communication	a lack of good communication means either to not listen well to what someone says or to not sharing clearly the wants and needs. Leads to misunderstandings, hidden interests	a good contract regulates the interests and expectations of each party. But for the contract to be successful, each party has to share its interests and expectations openly to bring them up as content for the contract and reach security for partners
Success factors	Stakeholder involvement	stakeholder involvement means Including anyone affected by pooling into the process	stakeholder involvement can support setting up an arrangement to give everyone involved a voice and the feeling to be heard. Therefore, contracting in pooling should include stakeholders already in the negotiation and set up phase, even before a concrete written contract is finalised and signed.
	Use of technology	To increase digital standardisation	Technology such as IT systems or resource planning software needs to be considered in contracting because of data protection matters. To agree in a contract on standardising the processes between pooling institutions and thinking of it before going into practice is crucial to make the pooling a success.
	Job design	the amount of autonomy in designing the tasks and shifts in the life of nursing staff	As pooling is based on flexibility of the nursing staff, contracting should clarify between the pooling parties what the needed level of flexibility is, the amount of hours to work in which time and what the pooled staff can expect from the job
Contract design	Payment	payment regulates who pays who, for what and when?	contracting has an own part for payment regulations and issues. As it is a crucial topic to every relationship, contracting supports this matter by having it fixed implemented in its statutes.So, who pays employee 1 of institution A while it works at the other institution or in a flex pool?
	Quality	How to assure high quality of care?	the quality of care is a service delivered by the pooling participants to their clients. Therefore, contracting can help to define a level of quality and how to achieve this.
	Performance	How to measure performance?	quality and performance are interconnected in pooling as the level of quality provided to client needs to be measured and monitored. Therefore, contracting helps to develop key performance indicators or incentives to measure the performance of the pooling participants. also, what is non or bad performance?
	Risk allocation	How to allocate risks between pooling participants? Who is when liable for what?	Risk allocation in pooling is considered to be something important for the participants. Contracting reserves some space in contracts to define potential risks and how to solve a risk or a failure. Contracting therefore supports the pooling parties in developing upfront potential scenarios that bear a risk and think about on how to solve them. Risks specific to pooling could be: who is liable if employee 1 of institution A makes a mistake in institution B? Who is responsible when performance is under the agreed level?

6. Conclusion

This research aimed to gain deeper insights into the topic of contracting for pooling personnel in the healthcare sector in order to decrease the shortage of staff. In the beginning of the research, different expectations regarding the outcome and the complexity of the pooling topic existed. It was assumed that the pooling cases are more straight forward and easier to document and compare them and draw out insights for contracting. . This assumption turned out to be wrong as realised during the interviews with the participants in pooling. The six cases found in the interviews are diverse and differ from each other in their set up and stage of project. Moreover, it seemed that combination of contracting regarding pooling in healthcare is unique and underresearched in literature. And therefore the different parts (pooling, contracting) needed to be viewed separately first and combined and conceptualised during the thesis process.

To answer the research question "*What contracting arrangements can support the pooling of personnel resources between healthcare organisations?"*, a literature review helped to understand the concepts of pooling and contracting separately. Insights from interviews with participants in pooling and experts in contracting supported to gain a clearer picture of the complexity of pooling and what to consider when pooling parties want to contract. As a motif, Figure 1 was adopted and complemented in multiple ways. The guidance developed is shown in chapter 5.3 and addresses the research question, namely that the complexity and variety in the cases is enormous. Therefore, not one solution to agree on a contracting arrangement fitting all pooling of personnel cases exist and there is not one recipe to follow while contracting.

Implications, limitations and further research potential

There exist several *implications* for this project. One is that the participants consider relational aspects as more critical than contracting issues. Moreover, there is a shift from competition towards cooperation as staff shortage is a problem for many healthcare institutions. Experts emphasised the potential to combine contracting with goals such as innovation, improvement of relationships and a clear role division. It is recommended to use the pre-contracting phase and contract design phase to clarify interests. Another implication is that this research helps participants in pooling in healthcare to understand with one look

at the guidance what barriers exist in pooling and what can support pooling and therefore contracting.

Regarding *limitations*, one could argue that the number of cases researched is too small. However, the six cases presented in this project are highly diverse and therefore show the complexity of the pooling topic. The complexity of the pooling of resources in healthcare is also the reason why this research cannot present the reader with one recipe on what to do when it comes to contracting in pooling. Another limitation might be that the guidance was not tested in practice. Nevertheless, it is a starting point for future pooling institutions.

Further research projects could focus on testing, elaborating, assessing and further developing the guidance, summarised in 5.3. Moreover, contracting seems to be of relatively low priority for pooling participants. Future research could study the question: when exactly is the right time to think about contracting in pooling resources? A third further research potential can look for a taxonomy among pooling cases in healthcare or other sectors.

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Appendices

Appendix 1: Interview Guide Pooling Participants

Starting Question:

1. Kan je jezelf en je organisatie even voorstellen? / Can you please introduce yourself and your organisation?
2. Wat was de motivatie om over poolen van capaziteit / resources na te denken? / What motivates your institution to think of implementing pooling of resources?
    i. Wanneer zijn jullie met de nieuwe opleiding begonnen? / When did you start pooling? / When do you plan to start pooling?

    ii. Wat precies is de rol van jou organisatie in de process van poolen? / What is the role of your institution in the pooling process?

outer context: rising costs and demand for healthcare, staff shortage

2. Welke situatie zie je op het moment voor verpleegkundige? How do you experience the current healthcare workers situation?

3. Welke ontwikkeling zie je in zorg in zort van kosten, aanvraag en schaarste aan gekwalificeerd personeel / staff shortage?

inner context: pooling of staff

4. Hoe poolt je organisatie de verpleegkundige? How does your institution conduct pooling of staff?
5. Hoe veele partien zijn bezig met poolen? How many parties are involved in the exchange of staff?
6. Welke voordeelen vind je in poolen? Did the pooling work out as expected? / What do you expect to achieve from pooling resources?
    1. *were the benefits realised? any anticipated benefits? (if no answer from participants)*
7. Wat leerde je organisatie van poolen? What did your institution learn from pooling resources and exchanging staff? / What do you expect your institution to learn from pooling resources and exchanging staff?

zoom in: contracting

8. Welke zort van agreement/ overeenkomst of contract bestaat tussen de KTZ en de Beatrix ziekenhuis voor het poolen?

   What kind of agreement did you reach between pooling parties? / What kind of agreement are you planning to reach between pooling parties?

9. Werkten de terms en conditions voor jou en je organisatie? Did the terms & conditions and specifications in the agreement work for you?

10. Wat wil je anders doen als je nog een keer poolen van personeel ga contracteren? What would you do differently next time in regard to agreeing with pooling parties? Which warning would you give to other pooling parties?

Closing questions / wrap up

11. *Welke tips heb je voor andere organisaties die willen poolen?*

    What would you recommend to other companies or institutions that plan on implementing staff pooling? (if not mentioned before, or asked earlier in the interview; depends on the flow)

12. Wat zijn de plannen voor de toekomst met poolen? What are the future plans of your institution regarding staff pooling practices (e.g. expanding)? *(if not answered before)*

13. Wil je nog iets zeggen? Is there anything else you would like to mention or share?

14. Heb je nog andere contacten die misschien willen met me praten over poolen of contracteren? Do you have any contacts that might be valuable for me to talk to?

Appendix 2: Interview Guide Experts

introduction

general introduction to my research and the topic (RQ: What contracting arrangements can support the pooling of personnel resources between healthcare organisations?)

- brief overview of key points to convey about my case(s)
    - pooling of staff to fight staff shortage of healthcare workers
    - contracting between pooling parties
- explain how expertise fits in my research

- interviews with participants in pooling and experts on contracting, then conceptualising, guide for contracting

Starting Question:

1. Please introduce yourself and describe your connection to contracting / agreements.
2. When did you start working with agreements?

3. Interviewer describes case of pooling (pick their brains in structured way) + show case model → how to contract well in that special case?

object of contract: what is contracted? exchange of staff

4. What, in your opinion, is most important to consider while contracting or agreeing on an exchange of goods and services?

process of contracting (phases):

a. pre-contract
i. What would the contracting parties need to agree on while closing an agreement?
b. during/mgmt. phase
c. review
i. how can the agreement parties make sure that the contract works out?

risk & performance

d. T&C
i. How would you design terms and conditions and specifications in an agreement between resource exchanging parties?
ii.
e. how to manage the contract
i. What would you expect as a challenge for the contracting parties?
ii. What benefits could you think off that the pooling institutions could achieve for their institutions from contracting in pooling?
iii.
f. how to measure performance? how to evaluate and incentivise?

5. **past research: conflicting? valuable? worth to discuss it?**

Closing questions / wrap up

6. Which research can you recommend (e.g. from you or colleagues)?
7. Is there anything else you would like to mention or share?
8. Are there any contacts you can connect me with that might be willing to talk with me?

Appendix 3: Coding Scheme and Themes Participants

Initial code	1st order themes	Category/themes
See case descriptions	Pooling participants	Introduction
In use Assessment of pooling as opportunity	Stage of project	
Before or after 2016	Begin consideration pooling	
Solutions for capacity shortage Higher efficiency of care High quality care Reduce use of agencies Collaboration instead of competition More efficient use of existing capacity	Objective for pooling	Expectations towards pooling
High pressure on staff Staff shortage Covid High healthcare costs Long education New laws	Pressures experienced	
Improve staff situation Standardised processes Increase efficiency Empowerment of staff Decrease use of agencies Stimulate inter-organisational cooperation	Opportunities of pooling	
Higher anonymity Standardisation is essential Challenges in equal distribution of resources in a pool Pooling cannot be the only solution Consideration of staff resistance Different retirement funds High complexity	Learnings from pooling	Reality / side effects / experiences

Use of pool when low demand		
Involve all stakeholders Adjust systems Cooperation and trust as success factors Consider use of software Create value and incentives Collaborate instead of compete Advertise benefits of pooling more	Advice for future projects	
Complexity Tax regulations Payment / financial aspects Not there yet	Contracting related challenges	
CAO Unpaid loan agreement Framework agreement Cooperation agreement Not there yet	Contracting arrangements	Purchasing-related
	Use of agencies	Alternatives to pooling

Appendix 4: Coding Scheme and Themes Experts

Initial code	**1st order themes**	**Category/themes**
Flexible working environment Autonomy Willingness to exchange in pool	Job design	Human resources related
Seasonality	Instable demand	barriers of pooling
Suspicious if all parties send the best resources they have to pool fair division of benefits	Lack of trust	
Payment for services financial issues	Monetary	
time to educate staff quality of predictions opposing interests	Organisational issues	
Communication with stakeholders	Relationship	Success factors of pooling
Trust between contracting parties		
Risk allocation Performance Joint procurement	Specifications	Contracting-related elements

Contract design Definition of pooling and teamwork		
Collective labour agreements Resource sharing agreement Framework agreement	Contracts	
Regulations of public or private institutions	Issues of contracting	
Role of technology I4.0	Technical progress	other