



ANALYSING THE EFFECT OF PLANNING OPERATIONS ON MENTAL WORKLOAD



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Bachelor thesis: Analysing the effect of Planning Operations on Mental Workload

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Preface

Dear reader,

You are about to read the bachelor thesis, the final assignment for my bachelor of Industrial Engineering and Management at the University of Twente. This thesis aims to incorporate human factors and preferences in planning and scheduling.

During the time spent on my research, I experienced a lot of interactions at the organization and gained a lot of practical experience and knowledge in the process. I would like to express my gratitude to the organization for allowing me to gain experience and knowledge during the period in which this thesis was conducted.

Thanks to my supervisors at Organization X for supporting me in this process by providing feedback and guidance and steering me toward the right people to ask questions to in this large organization. During the meetings and all other interactions, they were engaged in my process and how they could support me, for which I am again very grateful. Furthermore, I would like to thank the employees who made me feel welcome in the organization and helped me by answering my questions during my time there. Without the organization and their knowledge, I would have never been able to conduct this research.

I would also like to express my gratitude towards my supervisor from the University of Twente, Erwin Hans. His feedback, patience, and sometimes reassurance have helped me a great deal in the process of finishing my thesis. Our meetings were often fruitful and longer than planned, and he was always available for a short discussion, so another special thanks to Erwin and his devotion to supporting me during my research. I would also like to thank my second supervisor, Mireille Post-Hubers, for her feedback and help while finishing my thesis and for coordinating the particular circumstances in which this thesis was conducted.

Finally, I would like to thank my family and friends for their support during the research and writing of my bachelor thesis. Thank you for translating what I wanted to share into a formulation that could be understood, especially Aletta Lohschelder and Kim Buursema. Lastly, I would like to thank my father for letting me discuss my thesis with him every week in the car ride home until he had to support me silently.

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Management Summary

Context and motivation

Since the beginning of the new century, Child Services has struggled with the waiting list of children who need assistance. With COVID-19, these waiting lists have increased even more, leaving children and parents waiting for help. This growing waiting list pressures Organization X to treat as many children as quickly as possible. The high demand for care leads the healthcare professionals of Organization X to experience high workloads. Organization X is currently transitioning to a professional planning organization. The organization's goal is to move the planning responsibility entirely from the healthcare professionals to a new planning department so that the time spent on planning could be used to treat patients.

Goal of the research

The norm is to clarify healthcare professionals' schedules and stabilize their workload by taking over their planning responsibilities. To increase their overall efficiency and time spent on direct patient contact. These schedules should be more stable, leading to the aim of the research, which is **"To find possible planning improvements based on healthcare professionals' experiences/preferences, to stabilize the workload experience in the new planning system."**

Approach

To solve this problem, the research presents a quantitative and qualitative analysis of the current situation regarding the organization, the process of planning, and the definition and factors contributing to workload experience. The study uses various methods, such as a literature search, observations made at the time at Organization X and a questionnaire. Then, possible improvements are proposed based on the feasibility of the productivity norm of Organization X and the experiences/preferences of the healthcare specialist. These proposed improvements will be written out for application to Organization X so that they can gain insight into what they can do to stabilize the workload experience.

Results

The needed changes are complex to indicate. However, there are two angles to take when looking at improvements: those that effect the perceived workload and those that cause the actual workload. The perceived workload is catered to solve factors such as Expectations, Work Pressure, Personal Contact, and Reflection. These factors are researched by looking at moments of Rest, Work Regulation and Social Factors. The improvements were evaluated by searching the literature for possible relationships between the mental workload, the characteristics and the improvement. The potential improvements in the first two categories are of small format and are very subjective to the organization and the general work preferences of the employees.

The actual workload presents a change in testing the feasibility of the set norm of Organization X regarding the employees' productivity. This improvement is attributed to expectations and work pressure factors, as when a standard is not feasible, an increase in work pressure is expected. To reevaluate this norm and test if this is the case, Work Measurement is needed. This revaluation can be time-consuming for Organization X but is predicted to be an improvement when getting insight into the norm's feasibility.

Conclusion

The contribution of this study to science is to present a quantification of mental workload by researching possible causes within the Planning and Organization Management field. Despite the potential for significant improvements, the search on Scopus, Web of Science, or the University Library yielded limited results when finding optimization strategies for planning psychiatric institutions compared to hospitals. Consequently, exploring mental workload in healthcare also produced fewer outcomes, highlighting the need for further research and development. These arguments display a chance in science to research these specific subjects and therefore argue the contribution to the science of this research.

The relevance to Organization X is the list of improvements, such that the healthcare specialists working at Organization X are provided with a more stable workload experience, which can be implemented organization-wide. When looking at the cause and solution to the mental workload experience, the reevaluation of the job in terms of Work Design is relevant to successfully transitioning to the professional planning organization. This reevaluation of the job description can be done by assessing the caseload and the variability of the treatment times in the appointment and treatment periods of the patients. This creates clarity and more stability and an opportunity to test if the expected productivity is indeed not feasible and a probable cause of the mental workload experience of the healthcare professionals. Another advice to Organization X is to strive for a more standardized working process. Standardizing the working process will lead to a more automated working process, especially in planning. The automatization of the planning process will lead to this process being less time-consuming and an increase in the predictability of time management. This will create boundaries in treatment plans and clarity in the organization's expectations of its healthcare specialists.

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1. Introduction

In this chapter, the purpose of the research and the way it is conducted will be explained. This chapter will include a problem statement, Section 1.1 and the research aim. The research methodology following that description and the research aim is described in Section 1.2.

1.1 Problem statement

This section will explain and introduce the problem in section 1.1.1 and the company context in section 1.1.2. It will present the issue in Organization X section 1.1.3 and provide the norm and reality of the current situation leading to the research aim in section 1.1.4.

1.1.1 Problem identification

Since the beginning of the new century, Child Services has struggled with the waiting list of children who need assistance (Jeugdautoriteit, 2023). Organization X is a child and adolescent psychiatric centre with specialized care in ADHD, ADD, autism, and eating disorders. The high demand for care leads the healthcare professionals of Organization X to experience high workloads, which in structural form can lead to healthcare professionals falling out due to the work pressure. The decrease in healthcare professionals leads to fewer children receiving care and an increased waiting list. The high waiting list and the reduction of available staff create a heightened sense of urgency amongst general healthcare professionals, adding more pressure to an already tense situation (RTLNieuws, 2023). The growing work pressure on healthcare personnel over the years is supported by (Maurits, Veer, Spreeuwenberg, & Francke, 2016). According to the research, the workload for employees was reported to be more demanding in 2015 than in 2011 and 2013.

1.1.2 Company context

Organization X is a child and adolescent psychiatric centre. Organization X has departments in four provinces in the Netherlands: Overijssel, Gelderland, Limburg, and Noord-Brabant. There are three types of locations: Research Centre, Treatment Facilities, and Support Facilities. The treatment facilities are also known as polyclinics, where patients go for their appointments with needed professionals. The Support Facilities are the facilities that support the patients from their home environments. Organization X is located in Overijssel and has the following groups of employees: management, secretarial office, and treatment teams. A treatment team has twelve mental healthcare professionals with various capabilities to treat patients within the team, regardless of the diagnosis.

1.1.3 The problem with the new planning system

Organization X is currently transitioning to a professional planning organization. To make this transition, Organization X is working with an IT developer and consultation company to create a new planning system. The transitioning process is considered time-consuming, primarily due to the significant variation in planning methods. To develop an effective planning system, it is imperative to thoroughly analyse and understand the extensive diversity involved, thereby gaining valuable insights into creating a viable planning tool. The organisation's goal is to move the planning responsibility entirely from the healthcare professionals to a new planning department so that the time spent on planning could be used to treat patients.

The current planning methods are as follows: the managing of appointments is the responsibility of the healthcare professional, and the scheduling of appointments is a joint effort of the secretarial office and

the healthcare professional. This collaboration means the secretarial office is trying to communicate and schedule appointments for about fifty unique schedules. Due to the high diversity in appointments, treatments, working days, and working hours, the planning process is done by hand. This construction of planning is labour-intensive and lacks the advantage of getting insight into the work processed by employees. Much time is needed to gain an overview of the present schedule, which cannot be used to treat patients.

1.1.4 Core Problem

Since the organisation's goals are communicated, the underlying problems are easily identifiable. The experience of workload is a result of various underlying struggles. Nevertheless, specific issues are beyond capacity to resolve, either due to the need to alter individual behaviour or reliance on external factors, such as the organisation's financial health.

The financial struggle is a persistent issue amongst Child Service Institutes in the Netherlands, 40% of the institutes made a loss in 2022 (Jeugdzorg Nederland, 2023). The financial struggle at Organization X is said to flow from the inefficient use of time, according to employees. As a result of the time not being fully utilized, gaps in the schedule emerge, and spare time is announced too late to be filled with alternative tasks or appointments, rendering it unused. The extra time is not used for treating patients, leading organisations to miss out on generated income. However, the financial year plan causes the year's second half to be overscheduled. To compensate for the loss incurred in the first half of the year. This overscheduling can lead to high work pressure for healthcare professionals in the year's second half.

The long waiting list and the awareness of its consequences create a sense of urgency amongst healthcare professionals. The social responsibility of the profession and the increase in societal need have the healthcare professionals in a hold. This hold is acted out in the urge to fill the schedules so potential patients can get care as fast as possible. However, in line with the financial constraints, the long waiting lists are traceable to the planning circumstances. Implementing a general planning system can facilitate the regulation of healthcare professionals' time and create a clear space for patient treatment. This structure is currently not the case, resulting in planning that is too tight without allowance for unforeseen work. This lack of structure leads to high work pressure and frequent employee overtime. External factors, like the increasing trend in demand for youth and children's mental healthcare, also cause an increase in the waiting lists. These elements increase the waiting list, which Organization X cannot influence.

Project group Y has undertaken an evaluation of the workload experience of employees. However, their approach is objective, focusing solely on the schedule and disregarding the impact on the healthcare professionals who must adhere to it. While the professionalization of planning may address several organizational issues and partially alleviate the burden on healthcare professionals, it does not necessarily guarantee an improvement in their workload experience.

The core problem of the action problem is that the transition to a professional plan organization does not guarantee a reduction in the experienced workload of healthcare professionals. The core problem chosen in this research will be the workload experience since all other issues enhance the high workload experience of healthcare professionals.

This leads to a research aim:

“To find possible planning improvements based on healthcare professionals’ experiences/preferences, to stabilize the workload experience in the new planning system.”

1.2 Research Methodology

This section will describe the research questions following the research aim described in section 1.1.4 and the methodologies used to answer these questions. The research questions will be presented in section 1.2.1. The Research Design, data gathering methods, and format are in section 1.2.2.

1.2.1 Research Questions

The research aim is:

“To find possible planning improvements based on healthcare professionals’ experiences/preferences, to stabilize the workload experience in the new planning system.”

To find possible improvements, the following questions arise:

1. *How does the planning system operate, and what are the downsides according to employees?*
2. *How do employees rate their workload experience, and what are possible factors?*
 - a. *What causes the workload experience of employees?*
 - b. *What is the desired productivity rate of the management?*
3. *What are possible changes related to the planning system that can improve the mental workload?*

1.2.2 Research Design

Different data-gathering methods must be used to find the best answer to the research questions. As seen from the questions, they need elements of literature research, interaction in the organization, and internal documents to get to an answer. Besides that, the mixed methods approach will lead to a fuller-defined answer to the questions. (Lund, 2012). There are four types of research: descriptive, explanatory, quantitative, and qualitative. This research is about finding and elaborating on a possible relationship between mental workload and planning structure, leading to the research being explanatory. The literature studies needed to investigate this relationship is descriptive. There are two types of data processing, quantitative and qualitative (Heerkens et al., 2017). Both types of data processing are applied in the research. Qualitative processing is used to gather answers for the knowledge questions, like the definition and experience of workload. So that a deeper understanding of the issue is found, quantitative processing will be used when all the data is present to quantify it and project it to support conclusions made.

For question one, there is a need to describe the organisation's functioning and the impression of this functioning amongst personnel. This functioning will be investigated using qualitative data gained during meetings, conversations with employees, and observations made during time spent at Organization X. To answer question two, a qualitative literature study is needed that will be used to construct a questionnaire to gather qualitative data from personnel views, with a quantitative data analysis. The third research question will be answered using a qualitative literature study.

This research aims to find possible planning improvements based on healthcare professionals' experiences/preferences to stabilize the workload experience in the new planning system. The research results find the cause of unstable workload experience and determine if the solution can be found in planning and organizational management. The research results can be implemented in the planning system that applies to all other care teams and other locations and can help other psychiatric organisations transfer to a professional planning system and struggle with a high mental workload amongst personnel.

The contribution of this study to science is to present a quantification of mental workload by researching possible causes within the Planning and Organization Management field. The research on mental workload has often been conducted in industrial jobs or highly pristine jobs such as pilots or astronauts. This specialisation in research leaves a gap for research done regarding the subject of healthcare. Research has been done regarding hospitals, but psychiatry has not been a discipline in which this is tested. When searching on Scopus or the University Library, it was evident that there is a scarcity of literature concerning optimization in planning for psychiatric institutions compared to hospitals.

Additionally, the exploration of mental workload in healthcare yielded even fewer outcomes. Most of the available research primarily focuses on the impact of personnel on patients, neglecting the reverse relationship. This focus highlights the limited extent of research conducted on optimizing psychiatric institutions and understanding the workload experienced by personnel within these institutions despite the potential for significant improvements. These arguments display a chance in science to research these specific subjects and therefore argue the contribution to the science of this research. The relevance to Organization X is the list of improvements that can be made, such that the healthcare specialists working at Organization X are provided with a more stable workload experience, which can be implemented organization-wide.

1.2.3 Introduction to the main research variable

Workload experience is often described in research papers as a mental workload or cognitive workload. It entails the user's perceived level of mental effort, which is influenced by many factors, particularly task load and task design (NASA Office of the Chief Health & Medical Officer, 2023). The different literature studies confirm that mental workload is a multi-faceted phenomenon. According to (Hancock & Meshkati, 2000), mental workload can be related to physiological states of stress and effort. It can be divided into subjective experiences of stress, cognitive effort, and time pressure, and objective measures of performance levels and breakdown in performance.

These various aspects of workload have led to distinct means for assessing workload, including physiological criteria (e.g., heart rate, evoked potentials), performance criteria (e.g., quantity and quality of performance), and subjective criteria (e.g., ratings of level of effort), (Hancock & Meshkati, 2000).

2 Impressions of the Planning System

This chapter analyses the current planning process of the company as well as its structure to answer the first research question, “*How does the planning system operate, and what is the employee impression?*”. The organization's environment and societal position are described in section 2.1, and the organizational structure in section 2.2. The data systems used at Organization X and how they are used in section 2.3. The planning process is described in section 2.4.

2.1 Organization Environment

Organization X is a prominent child and adolescent psychiatric centre in the Netherlands, renowned for its academic background and extensive network that enables the delivery of optimal patient care. The organization has departments in four provinces, namely Overijssel, Gelderland, Limburg, and Noord-Brabant, with three distinct types of locations: Research Centre, Treatment Facilities, and Support Facilities. The Treatment Facility is where patients go for their appointments with their needed professionals and on a regular appointment basis. The Support Facilities are the facilities that support the patients in their home environments.

One such Treatment Facility is Organization X. This department comprises three distinct groups of employees, namely the management, the secretarial office, and the treatment teams. The treatment teams, consisting of approximately twelve individuals with varying functions, operate as independent units and are responsible for providing care to incoming patients. Given the mixed caseload of diagnoses typically encountered during intake, the teams are equipped to handle the patient's care within their team.

At Organization X, Poli, FACT, and IBC are three distinct practices. Each of these is characterized by a unique group of healthcare professionals operating within their boundaries. The Poli is where patients go for repetitive low-intensity treatment. Four teams, which consist of approximately fifty healthcare professionals in total, are operating at Poli Y. These teams are separated by working days since most treatments are done in pairs. Hence, sorting healthcare professionals by the day seemed logical. This division holds for the first three teams, and the fourth concerns the Young Child therapy group for children under six.

FACT is a specialized group that collaborates with other healthcare institutions to provide optimal care in the patient's environment. In addition to Organization X, other child and adolescent psychiatric institutions, schools, and municipalities are involved in the child's treatment process. The care process is conducted in the child's natural environment, home or school. The patients treated at FACT have more critical conditions than those treated at Poli.

The IBC (Intensief Behandelen Centrum) serves as the intensive treatment centre of Organization X, catering to patients with suicidal tendencies or treatment for eating disorders. The centre offers two distinct treatment flows: the HIC (High Intensive Care) and the IHT (Intensive Home Treatment). The former involves admitting patients to the IBC for multiple days, during which they receive high-intensity therapy and treatment to facilitate their discharge as soon as possible. Following this, the IHT takes over, with multiple-hour sessions conducted frequently at the patient's home. It is worth noting that the IBC offers the most drastic level of treatment compared to the other two practices.

This research will focus solely on location X, as the practice is currently being transferred to the professional planning organization.

2.2 Organizational Structure

The Poli X consists of three layers: the management level, the healthcare professional level, and the secretarial office. This construction is changing by adding an extra system alongside the secretarial office that evolves around healthcare professionals' planning and scheduling activities and the booking of office employees.

The management of X consists of three persons who specialize on two levels. Organization X follows a management duos model, where each duo consists of a business operations manager and a treatment operations manager. Additionally, there is a trainee business operations manager at X.

The clinic's healthcare professionals operate in teams that consist of a diverse range of specializations. This team-based approach enables the delivery of comprehensive onboarding, treatment, and supportive care to patients within a single cohesive unit. Each team of twelve to fifteen healthcare professionals convene weekly to share their experiences and address the needs of patients requiring special attention.

The secretarial office is staffed by approximately twelve employees who conduct general secretarial tasks, such as picking up the phone, answering questions, and welcoming patients into the clinic. Additionally, scheduling appointments is currently done in two ways, as discussed in section 2.4. The transition to a professional planning organization can be seen in the change in staff utilisation at the secretarial office. There is a division between employees who carry out tasks as before and employees who work according to the new organizational structure.

Another temporary party in the clinic's organizational structure is Project Group Y, responsible for initiating the professional planning organization. Currently, three project team members are actively involved in the daily operations. In contrast, two others oversee the implementation of the new systems at a managerial level in coordination with the clinic's managers.

2.3 Data systems

To understand the planning system, all data systems and their functionalities need to be explained. This section is dedicated to providing that information.

2.3.1.1 *USER*

USER is the electronic health record system containing patient dossiers and their treatment progress. Additional functions of the system are agenda management, registration, and declarations. Healthcare professionals extensively utilize the agenda function, which can be modified by the secretarial office and the healthcare professional. The appointments are categorized by different types and colour-coded for ease of reference. Furthermore, USER allows for the inclusion of patient IDS and space for comments or progress notes. USER is the primary data system used to gain an overview of activities for healthcare professionals.

2.3.1.2 *Youforce, Beaufort*

Youforce is the loan administration system that stores employees' contracts, hourly rates, and working hours. Additionally, it encompasses information related to travel expenses, excused absences, and other

human resource data. This information is transferred to Beaufort so that these details can be used in different systems.

2.3.1.3 *DURF*

DURF is a reporting tool used to gain an overview of information for the healthcare professional. The system combines all information from the other systems, like Youforce and USER, so that the data can be presented in one dashboard. Moreover, there is an option to manually complete personnel hours forms, which are exclusively available to managers. These forms concern team hours and non-patient-related time, such as education or other projects.

2.3.1.4 *Shared mailboxes*

The secretarial office utilizes shared mailboxes to create an easier transition between planning and general secretarial tasks. Additionally, the mailboxes serve as extra data storage, allowing easy access to information if the appointment information is incomplete.

2.3.1.5 *Planning overviews*

Planning overviews are created for each healthcare professional for the entire year, considering their contracted hours, current patients under their care, and future workload preferences. These overviews serve as a reference for planners, providing information on the availability of healthcare professionals within the schedule and the corresponding week. This framework and overview assist planners in efficiently scheduling appointments.

2.3.1.6 *Power BI*

There is space for active reflection and insight into the upcoming period in the planning process. A Power BI dashboard presents a comprehensive overview, integrating Youforce and USER data regarding contracted hours and actual scheduled working time. This dashboard is used to analyse recent events and possible trends and what potential actions need to be taken based on the results obtained.

2.4 *Process description*

It is necessary to examine the current planning state to identify potential solutions for the future. In this section, the question “*How does the planning system operate, and what is the employee impression?*” will be answered by analysing the current planning structure and the user shortcomings.

A process map was developed using Business Process Mapping to gain insight into the appointment scheduling process. Business Process Diagrams are based on flowcharting techniques, especially for graphically visualizing business process operations (White, 2004). In this research, BPMN is used to create a Business Process Diagram of appointment scheduling in Figure 1 to create insight into an appointment's standard process, from requesting an appointment to scheduling it, regardless of the appointment type. The lanes represent the different departments handling certain aspects of appointment scheduling. Furthermore, there are three types of flow objects: squares, diamonds, and circles. The activities are represented by squares, decisions by diamonds, and events by circles (White, 2004).

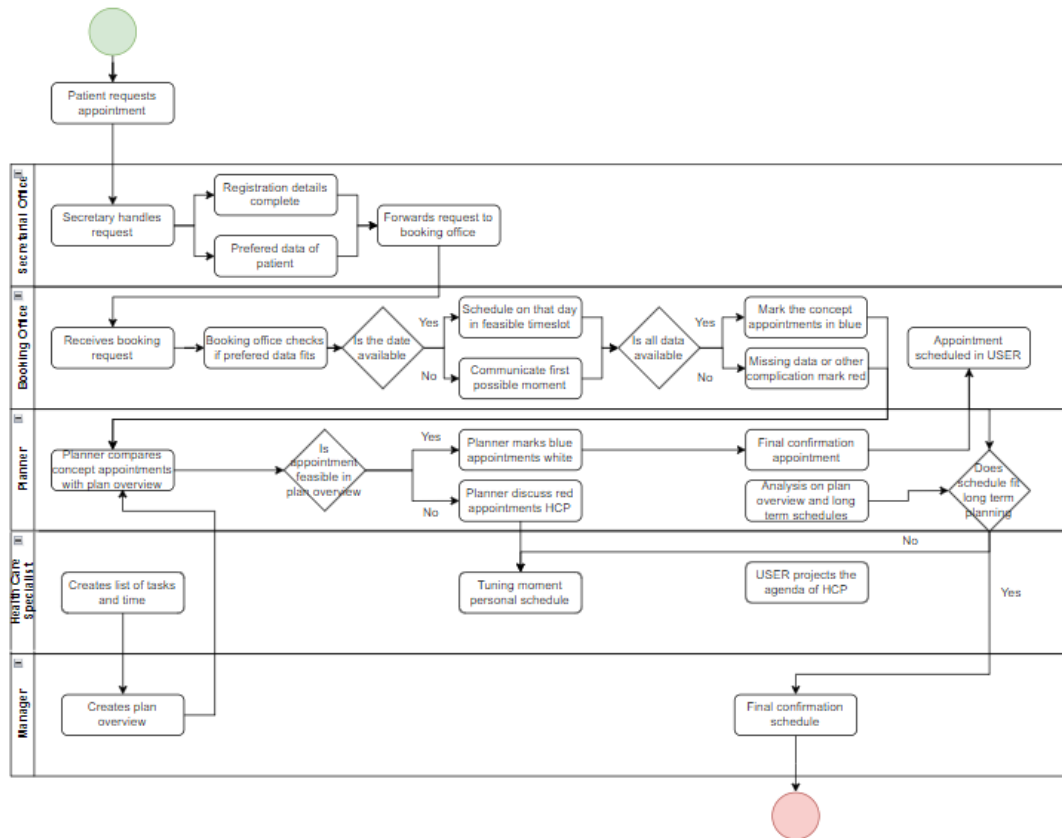


Figure 1 Business Process Map of the new planning & scheduling at Organization X, following White 2004

The planning system operates in the following manner: the general manager will make an overview of yearly tasks, which include direct patient contact, indirect patient contact, and other activities related to the healthcare professional's work and function. Generic examples are team meetings, medical field meetings, and administrative tasks like replying to emails. These tasks are then broken down into specific actions, and a weekly timeframe is assigned in minutes.

The process starts with an appointment request. These requests can originate from internal sources, patient or parent contacts, or external institutional contacts. This request comes to the relevant healthcare professional or the secretarial office via oral transfer, phone, or mail. The patient requests an appointment, which is processed via the secretarial office. The office denotes the essential details regarding the appointment, Patient ID, preferred data, times, and the conditions of the visit. Once this information is processed, it is emailed to the booking office. The planner will list these appointments in the Planning Overview in yellow. The booking office will then process the request and check the date and time of the appointment in USER. If feasible, the appointment will be scheduled and colour-coded in white. If colour-coded blue indicates that it is conceptually planned, meaning that the invite for the appointment still needs to be made or that there is a minor question for the appointment holder or the planner. If the preferred appointment time is unavailable, the booking office will notify the patient and deliver an alternative list of feasible appointment times. If the appointment cannot be fully processed due to circumstances, such as missing information or unclear instructions, the appointment is marked yellow. The appointment is marked red if it does not fit into the schedule.

The planner evaluates the conceptual appointments. If the appointments are feasible within the plan overview and marked blue, the last information is collected, and then the appointment is marked white to indicate confirmation of the appointment. The booking office is responsible for finalizing the appointment, such that it is depicted in the healthcare professional's schedule. If a concept appointment is marked yellow due to lacking information, the booking office is responsible for gathering the data. If the concept appointment is marked red for another reason, the planner will discuss the appointment with the healthcare professional or manager. When the schedule is complete for some time, the manager will give the final confirmation to the planner to set the schedule.

If there are matters of discussion following the planning, there are several reflection moments. The planner engages in a weekly meeting with the healthcare professional to discuss the feasibility of the agenda and the activities that still need to be added. Another is the reflection moment between the manager and planner, which happens when the planner identifies structural over or underworking in the schedule of a healthcare professional. Depending on the situation, the manager will process and handle this observation as they see fit.

2.4.1 Process impression

Organization X is currently transitioning to a professional planning organization. To make this transition, Organization X is working with an IT developer and consultation company to create a new planning system. This new process is described in section 2.4. This transition has proven to be time-consuming due to the high level of differentiation in the planning methods. The previous planning system also faced the challenge of accommodating this diversity, resulting in manual planning due to the wide range of appointments, treatments, working days, and working hours. This labour-intensive process lacks the advantage of providing a comprehensive understanding of the work carried out by employees. As a result, secretarial staff and healthcare professionals require significant time to obtain an overview of the schedule, leaving no opportunity for patient care.

The new planning system allows a different employee to manage the schedule of the healthcare professional, with the instruction to fit the list of appointed tasks in the schedule. Due to the relatively new system, every bit of time the healthcare professional has will be filled with tasks or appointments, leading to little spare room. In their willingness to treat patients, healthcare professionals often start working time, even when people work twice their contracted hours. Working overtime happens to the extent that it is more structural than incidental over time.

When at the organization in meetings and observations, the general employee impression of the transition of systems was vague due to the unclear communication channels. Plus, scheduling an appointment takes more time or steps than before. Using more steps leads to healthcare professionals not following the assigned channels and scheduling appointments. Besides, some appointments are now double-planned or partially overlapping due to the limited time. Due to miscommunication and double scheduling, healthcare professionals assume responsibility for the schedule. This assumption is primarily attributed to their lack of complete trust in the new system, resulting in them dedicating more time to patients while still feeling obligated to manage their schedules. We concluded that the employees' impression of Organization X is that the new system needs adapting, resulting in the healthcare professionals' lack of trust in the system and their partial takeover of scheduling tasks. This takeover undermines the system's communication, leading to double work.

2.5 Conclusion

This chapter analyses the current planning process of the company as well as its structure to answer the first research question, “*How does the planning system operate, and what is the employee impression?*”. The chapter used internal documents and conversations with personnel to sketch the organization structure, data systems, and the current planning process.

The planning system uses a plan overview per healthcare professional and appointment requests. These two need to be scheduled by the newly introduced booking office. The planner tests the feasibility of these bookings, and they have the manager's final approval. Power BI tracks the schedules for structural time shortages or other planning-related exceptions.

The allocated time in the schedule is usually utilized to its maximum capacity, resulting in appointments being frequently scheduled simultaneously. There is still a lot of diversity in appointment times, treatments, working days, and working hours. The scheduling of appointments often takes longer because of the variability in schedules and gathering the missing information needed to fill in the appointment request. Besides, when the schedule cannot be followed, meaning there is more time required, the remaining tasks from the schedule are done in overtime, which now happens on a more structural than incidental basis.

Introducing the booking office amongst personnel is confusing to both the former sectorial office as it is for the healthcare professionals. This confusion occurs in communication, making scheduling much less efficient and leading to schedule mix-ups. The inefficient scheduling process leads healthcare professionals not to follow the assigned channels and schedule appointments. Hence, the system is not fully functioning, causing the healthcare professionals to feel responsible for their schedules. However, they do not have the time to manage this due to the time now used for treating patients.

3 Workload experience definition

This chapter aims to provide an understanding of workload and how it is perceived in Organization X. This is done by answering the question: “How do employees rate their workload experience?”. The answer will be researched by a questionnaire regarding the rating of the workload by employees with results in section 3.1. The desired productivity of Organization X is discussed in section 3.2.

3.1 What are the causes among employees?

A questionnaire was created and distributed among the staff members at location X to gather insights into their opinions on planning practices. This questionnaire can be found in the appendix of Chapter 6. The questionnaire is a variation of standard formatted questionnaires regarding workload experience and self-made questions regarding planning insights and organizational interests. The workload experience and time pressure questionnaires used for the questionnaire's content are (Expertise Centrum van de Arbeidsinspectie, 2011) and (Federatie Nederlandse Vakbeweging, 2023). The questionnaire aims to test the workload definition amongst employees of the organization and see what possible causes in the planning system might be.

The questionnaire was sent out to 72 employees and received 21 responses, from which 17 were complete responses, which represents 23,6% of the healthcare professionals working at location X. The categories in which the workload and planning experiences were tested are stress/time pressure, time allocation, personal experience and planning preferences. The questionnaire ends with three open questions asking to fill in any other insights that were not covered in the questionnaire. Below is a summary of findings and relations between specific results.

The questionnaire was made using Qualtrics and distributed via the mail. Qualtrics's properties are a web and mobile version of the questionnaire, the property of remembering progress, and sending a mass reminder to the sample group. The results were analysed using Qualtrics and the book (Field, 2018). The results are presented in frequency tables. The statements can be agreed upon in 5 levels: totally agree, agree, neutral, disagree and totally disagree. Some questions do not follow the same response; however, they follow the same level of positive-to-negative agreement.

3.1.1 Stress & time pressure

According to (Hancock & Meshkati, 2000), mental workload can be related to physiological states of stress and effort. A higher perceived workload can result in feelings of stress and time pressure, such as the inability to finish work. These feelings are translated into six statements covering the frequency of time shortage, the number of times working overtime and whether the work environment is relaxing.

Results Stress & Time Pressure	Totally				Totally disagree	Mean	Standard deviation
	Agree	Agree	Neutral	Disagree			
1 I regularly work under time pressure	0	2	4	11	1	3,8	0,8
2 I do not have ample time to finish my work	5	8	3	2	0	2,2	0,9
3 My days are often planned topfull	2	8	5	3	0	2,6	0,9
4 I often work overtime	3	1	7	5	2	3,3	1,2
5 I work overtime at the following moments	10	6	2	x	x	1,6	0,7
6 I do not relax at work	0	4	11	3	0	3,1	0,6

Table 1 Results Stress & Time Pressure, 18 respondents, conducted June 2023, questionnaire Appendix A

Table 1 shows that statement 1 has a largely negative response, resulting in 16 respondents (88.9%) working under time pressure regularly or more often. This feeling of having to little time is also

confirmed in statement 2, where 13 (72.2%) agree with “I do not have enough time to finish my work”. When looking at the standard deviation of the answers, the value is 0,94, which indicates that there is no general answer to the question. However, when asked about the ambience of the workspace and if this is relaxing, most respondents answered neutral. This answer is peculiar because this feeling often affects the workplace atmosphere when work is stressful.

3.1.2 Time allocation

When the stress and time pressure aspects were tested, it was time to check where the possible lack of time was coming from and if this created panic when working. The relationship between stress and potential causes are researched, including lack of overview, panic, flexibility in agenda, expectations and reality of patient bound time and communication of the schedule. These possible causes are based on the time spent at Organization X and the struggles presented by employees when discussing the planning system.

Results Time Allocation	Totally				Totally disagree	Mean	Standard deviation
	Agree	Agree	Neutral	Disagree			
1 I have little insight in how occupied I am	1	4	1	10	1	3,4	1,1
2 I often panic when viewing the agenda of the day	0	0	3	12	2	3,9	0,5
3 I get structure from the format of my working days/weeks	1	10	3	3	0	2,5	0,9
4 I have a fixed rhythm for (almost) all of my work weeks	0	7	2	4	4	3,3	1,2
5 I have adequate time during the week to actively reflect on my work	0	2	2	6	7	4,1	1,0
6 If an appointment is rescheduled, I can compensate this time filling it with other activities	6	7	3	0	1	2,0	1,0
7 There is enough flexibility in my schedule to provide emergency care	1	2	3	9	2	3,5	1,0
8 I have enough time in the week to take my designated breaks every day	1	4	0	9	3	3,5	1,2
9 I often take on extra work even though it does not fit into my (long-term) planning	0	4	8	3	2	3,2	0,9
10 I agree to agreements that are not relevant to my duties	0	6	3	7	1	3,2	1,0
11 The amount of patients I have in my caseload is fitting	1	6	3	7	0	2,9	1,0
12 The amount of time I need per patient is often exactly the planned time	0	4	5	8	0	3,2	0,8
13 The amount of time I spend treating patients is 100% of my working hours. There is no room for tasks on the side	0	3	1	9	4	3,8	1,0
14 I spend a lot of time gaining insight into my work	7	4	6	0	0	1,9	0,9
15 The time I take to gain insight into my work causes stress	1	5	8	3	0	2,8	0,8
16 I know what my agenda looks like for the coming...	2	0	3	3	9	4,0	1,3
17 The period in which my agenda is available feels well in advance	1	7	5	3	1	2,8	1,0

Table 2 Results Time Allocation, 17 respondents, conducted June 2023, questionnaire Appendix A

In section 3.1.1, most respondents indicated that they work under time pressure and struggle to finish their work in the given time frame. This majority, however, does not create a lack of overview or a feeling of panic. Even to the extent that 14 (82.7%) do not panic when looking at their agenda. The other statement in Table 2 covers the lack of time for certain aspects of the job or how easily unexpected free time can be filled with other tasks. This seems to be a conclusive answer, but when looking at the standard deviation, the value of 1,08 indicates that there is no such thing as a general answer to the statement. As expected from the results in section 3.1.1, unexpected free time can be quickly filled with different tasks. There are multiple things the respondents feel they do not get the time for, such as actively reflecting upon work (statement 5), flexibility to tend to crisis care (statement 7) and time to take designated breaks (statement 8). All further statements also have a larger standard deviation than zero indicating that there is no conclusive answer to the statements. This can also be caused by the small sample size leading to one outlying answer weighing more heavily than when the sample size is larger.

The lack of time to stand still and reflect upon their work and the lack of space to take the designated breaks can cause a higher experience of the perceived workload. This lack of time can also be caused by the employees not taking these moments themselves, and high workloads would be positively related to the desire to detach from work. Still, at the same time, high workloads would also deter employees from taking breaks (Phan, 2022). The results of Table 2 indicate that the high perceived workload can be traced by the lack of time or the choice not to take a moment of rest.

The lack of time can be caused by spending too much time on other aspects of the job, such as creating an overview of the agenda (statements 14 and 15), the expected versus actual time spent per patient (statements 11, 12 and 13) or other tasks that are not their responsibility (statement 9 and 10). The other two statements cater to the communication of the schedule and if it is a reason to feel uncertain. The results of these statements are presented in Table 2.

The results of statements 9 and 10 are neutral, showing that taking upon work irrelevant to their job description does not indicate where the shortage of time can be tracked. The number of patients in the respondents' caseload, so the number of patients they need to treat per year, has a neutral answer. The answers are conflicting, meaning 7 confirm that it is fitting, and 7 states this is not the case. This conflict can be tracked to the different disciplines of psychological care that the respondents cover. Statement 12, “The time needed per patient is often the time planned per patient.” has an 8 (47.1%) disagree response, meaning that almost half of the respondents do not feel that the expected time per patient equals the actual time per patient. However, 13 (76.5%) of the respondents disagree with the patients taking up 100% of their working hours. This result means that even though the patient treating time does not equal the planned time, the respondents do not feel that patient-related work takes up their whole agenda.

The time spent on the agenda is researched in statements 14 to 17, from time spent on understanding the agenda, the communication, and how these two are experienced. The time spent getting insight into their agenda is less than 60 minutes per week, and has a neutral response to it causing stress. The number of weeks for which the agenda is clear is two weeks in advance; this is an adequate amount of time for 8 respondents (47.1%).

In short, the feeling of time shortage can come from two possible causes: not having a moment of rest and the reality of time spent per patient not being equal to the planned time per patient. Further, the agenda-related causes are answered mostly neutrally, making it hard to determine if they relate to the feeling of time shortage.

3.1.3 Personal experience

These various aspects of workload have led to distinct means for assessing workload, including physiological criteria (e.g., heart rate, evoked potentials), performance criteria (e.g., quantity and quality of performance), and subjective criteria (e.g., ratings of level of effort), (Hancock & Meshkati, 2000). For this research, the performance and personal criteria are tested amongst employees. Since the planning and stress are tested, the subjective criteria of fatigue (statement 4), satisfaction (statement 1) and occupation of the mind space (statements 2, 3 and 5) are questioned in this part of the questionnaire.

Results Personal Experience	Totally				Totally disagree	Mean	Standard deviation
	Agree	Agree	Neutral	Disagree			
1 I go home satisfied after a day at work	1	8	5	3	0	2,6	0,8
2 I am at home without thinking about work	0	1	3	10	3	3,9	0,8
3 I have trouble going home because my work is not finished yet	1	6	3	6	1	3,0	1,1
4 I often come home tired after my working day	1	11	5	0	0	2,2	0,6
5 I can keep work and private life apart	3	8	4	2	0	2,3	0,9
6 I started looking for another job because of the pressure I experience at work	1	4	1	8	3	3,5	1,2

Table 3 Results Personal Experience, 17 respondents, conducted June 2023, questionnaire Appendix A

The statement regarding satisfaction is answered positively by 9 (52.9%) of the respondents, meaning that after a workday, they go home satisfied with their work. When looking at fatigue (statement 4), the respondents have not once disagreed with the statement, “I often come home tired from work”, meaning

that the work does strain the employees. When looking at the standard deviation value of 0,55 also indicates that the respondents are answering the question with a similar opinion. The statements regarding the occupation of the mind space have contradicting answers. The answers to thinking of work and keeping work and private separate are contradictory—the answer regarding thinking of work when home is answered confirmatively with 13. However, when asked about keeping work and private separated, 11 of the respondents confirmed they successfully did so. 76.5% of the respondents contemplated work while at home, which could be because they find it challenging to cope with the responsibility of leaving unfinished work at their job. This cause was tested in statement 3, which was answered perfectly neutral, so even though the respondents did not all respond neutral and not even the majority, the general outcome is neutral, translating that the opinions of feeling responsible for unfinished work are mixed and inconclusive. Hence, the responsibility of leaving unfinished work is not a definite cause of thinking of work when coming home. Even though there is evident mental fatigue and mental occupation, the employees are not searching for another place of work due to these causes.

3.1.4 Planning preferences

Since the variables we wanted to test from the literature were tested, the possible solutions in planning were tested. These solutions are tested by testing likely planning preferences from the respondents. These preferences are regarding social time, structure of the work day and moments of rest.

Results Planning Preferences	Totally				Totally disagree	Mean	Standard deviation
	Agree	Agree	Neutral	Disagree			
1 I have enough time to be involved with my colleagues	0	3	1	10	2	3,5	0,9
2 I would like a fixed structure in my daily schedule	0	7	1	7	1	2,9	1,1
3 I would like a fixed structure in my weekly schedule	2	5	0	8	1	2,9	1,3
4 I would like fixed office hours from 8:00 AM to 6:00 PM	2	7	4	2	1	2,4	1,1
5 I would like to have fixed appointment blocks where appointments can be scheduled for my patients	0	6	3	5	2	3,0	1,1
6 I would like a moment at the beginning of my day to get started	9	5	1	0	1	1,6	1,0
7 I would like to take a moment at the end of my day to reflect	8	6	1	1	0	1,6	0,9

Table 4 Results Planning Preferences, 17 respondents, conducted June 2023, questionnaire Appendix A

When researching the preferences in literature, the relations between perceived workload and social time, work structure and moments of rest. The following conclusions can be made that social ties and interactions are related. It can be argued that social contact influences the relationship between the level of self-management and perceived workload. There are likely situations in which the relation differs. First, social support is essential for team employees because it relates to their work demands (Halbesleben, 2006). Support from both a manager and colleagues can bring an employee resources. Therefore, it could make employees better able to deal with the increasing demands and thus could lead to lower perceived workload.

The literature also confirms a relationship between the structure of work and work days and workload. However, to find the relationship between perceived workload and structure, the weight of individual preferences must be considered for a definite answer. Research has demonstrated a correlation between the standardization of office hours and the mental workload, health, and overall well-being of employees (Wu, Roemer, Kent, & Ballard, 2021). However, it is crucial to acknowledge that the impact of this standardization on reducing mental workload is contingent upon individual employees and their work ethics. Routine days can add clarity for the employee because the day's expectations are clear. However, they can also lead to routine and boredom (Irfan, 2022).

Statement 1 has a large majority of respondents 13 (76.5%) confirming that they do not feel there is room in their schedule to be actively involved with their coworkers. They are indicating some shortage

of social relationships on the work floor. Further, the statements regarding structure, statements 2 to 4, were mainly answered as contradictory. The idea that these answers could be contradictory has also come forward in the literature regarding structural preferences.

Regarding the moments of rest, however, statements 5 and 6 were answered with interest, mainly statement 6 regarding the need for a moment to reflect at the end of the day. Research has shown that breaks provide a degree of mental rest, which can reduce mental fatigue and alleviate the strain of mental workload throughout the day (Chen, Barnes, & Harper-Sciarini, 2010). The reflection moments that have been deemed attractive out of the questionnaire. This attractiveness aligns with the definition of mental workload, which encompasses the subject of reflection. A potential adjustment to the current planning structure could involve incorporating a fifteen-minute reflection period each day. The open questions regarding the timeframe of these reflection moments came to a total time of 15 minutes.

3.1.5 Open Questions

At the end of the questionnaire, three open questions were asked to get insight on the cause of the work pressure, what the organization could do about it and if other causes in scheduling cause this work pressure. The answers to the first statement, "I experience a lot of work pressure because of, " were loose tasks/projects, taking over someone else's functions, the high production standard and the increasing complexity of the patients. When asked what the organization can do about this, the general answer was that it should reflect upon its strategy. There were opinions stating that the high complexity of patients needs to be considered when determining the number of patients a healthcare professional can treat. Another one is that the organization should trust their employees more to want to treat the patients to the best of their abilities and not have to prove every treatment step that has been taken. The last question, which referred to possible causes in the planning system, was answered by the majority, stating that there are a lot of double-booked appointments.

The open questions indicate that the variables set to be investigated in the questionnaire are not the only aspects that cause mental workload. Some things have to do with the work environment, which is not easy to answer using scales presented in the questionnaire. The questionnaire finds answers to concrete questions or scenarios that are planning-related or perceived workload-related. These questions are primarily standardised amongst organizations and companies, which can result in it not covering the entirety of the situation at an organization. For example, the statement related to trust is a subject that has not been questioned in the questionnaire. The open answers indicate the cause of the high perceived workload at organization X better than the closed questions did. Therefore, confirming the preset aspects is good; however, to continue research regarding possible solutions, open-answer questions are essential to test feasibility.

3.2 The desired rate of Organization X

The desired level of productivity, specified as direct patient contact within Organization X, is strived to be 86% of the contracted working hours. The desired productivity entails the total number of hours subtracted by vacations and sick leave to have 86% of the remaining time allocated to tasks directly related to delivering care or treatment. The remaining 14% can be devoted to other non-treatment-related responsibilities.

The 86% comes from an internal standard that is financially motivated. Two angles lead to this quantification. The first one is the caseload per healthcare professional; this means the number of patients a healthcare professional can treat within their expertise. A caseload represents the number of hours and intensity of treatment necessary for the patient. The municipality regulates the number of caseloads per healthcare professional in Organization X. The second one is the financial objective, the number of patients Organization X must treat to remain financially healthy (Organization X, 2021).

The goal of Organization X is that the norm of 86% patient-bound time is an average division for the whole year, where the fluctuation can operate between 70% and 100%. The current situation does not align with this objective, as evidenced by team three's picture from the previous year, 2022, which reveals significant variability in work intensity. The green area depicted in the pictures represents the range within which Organization X aims for its employees to operate, specifically between 70% and 100% productivity. This range was achieved in 53% of the weeks in 2022, while the remaining weeks are outside these bounds. To address this issue, Samen Beter is actively working on stabilizing productivity by implementing a planning structure based on the annual plans for each healthcare professional.

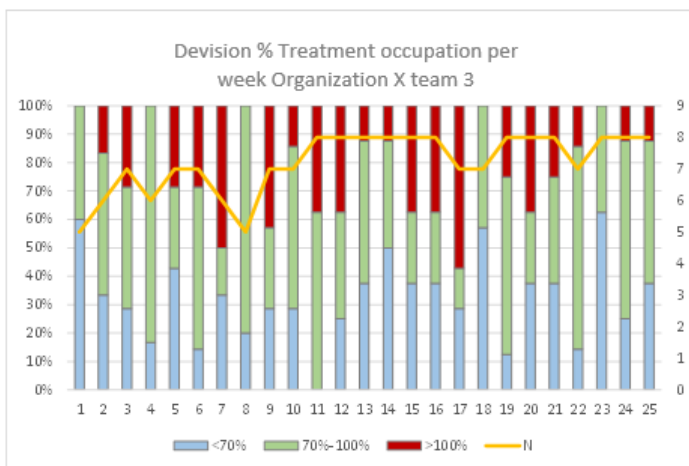


Figure 2 Graphical representation of Division % Treatment occupation week 1 to 25 in 2022

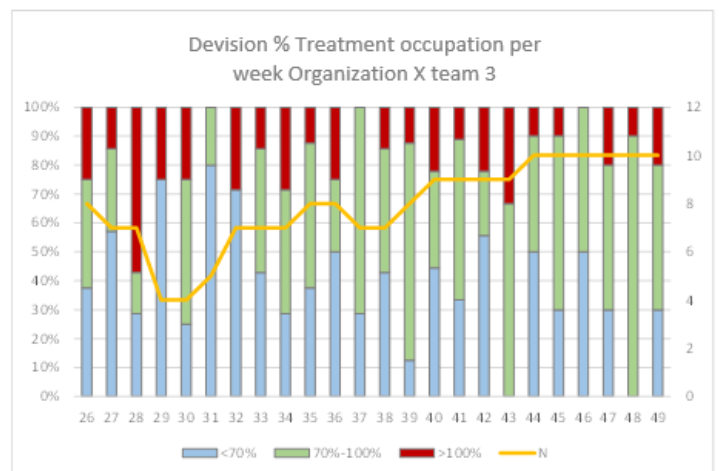


Figure 3 Graphical representation of Division % Treatment occupation week 26 to 52 in 2022

3.3 Conclusion

This chapter aims to provide an understanding of the concept of workload and how it is perceived in Organization X. This is done by answering the question: “*How do employees rate their workload experience, and what are possible factors?*”. The definition of workload experience is researched by conducting a literature study and questionnaire to answer this question. The workload referenced in this research is better known as the mental or cognitive workload. This workload is catered to express the mental capacity occupied by the employee for conducting their work. For this research, the following aspects are tested in a questionnaire: Fatigue, Satisfaction, Stress and Work Pressure, Overview, Expectations, Reflection, Personal Contact, Communication, and Overworking.

The feeling of working under pressure has been confirmed to be regularly or more often by 88.9% of the respondents. When looking at causes where this lack of time can come from, two possible causes came forward: the not having a moment of rest and the reality of time spent per patient not being equal to the planned time per patient. This response is confirmed when looking at the open-answer questions from the questionnaire.

Further, the agenda-related causes are answered neutrally, making it hard to determine if they are related to the feeling of time shortage. When looking at fatigue, the respondents have not once disagreed with the statement, “I often come home tired from work”, meaning that the work does strain the employees. The reflection moments that have been deemed attractive. The factors from the questionnaire related to the mental workload were Expectations, Work Pressure, Personal Contact, and Reflection.

When looking at the desired workload of Organization X, the current situation does not align with its objective, as evidenced by team three's picture from the previous year, 2022, which reveals significant variability in work intensity. This reality confirms the feeling of a shortage of time since the employee cannot meet the norm set by the employer.

When looking at the shortcomings of the planning system, there are some things related to what the questionnaire respondents feel and their opinions on the new planning system. The available time in the schedule is often filled to the maximum allowed, and appointments are usually scheduled simultaneously. Besides, when the schedule cannot be followed, meaning there is more time needed, the remaining tasks from the schedule are done in overtime, which now happens on a more structural than incidental basis. This trend supports the 72.2% of the respondents who feel there is too little time to finish work.

4 Possible improvements

In this chapter, we will compare the mental workload opinions defined by Organization X and possible planning additions to determine the best fit for Organization X. This analysis will address the question, “*What are possible changes related to the planning system that can improve the mental workload?*”. To accomplish this, we will utilize the results from the survey analysed in Chapter 3 and conduct a literature study on planning strategies that are advantageous to personnel preferences and workload experience in healthcare. The factors from the questionnaire related to the mental workload were Expectations, Work Pressure, Personal Contact, and Reflection. The possible changes are categorized as perceived workload changes in section 4.1 and actual workload changes in section 4.2.

4.1 Perceived workload changes

In this section, the changes regarding the actual workload are presented; these contain Rest and Reflective moments in section 4.1.1, Regulations in section 4.1.2 and Social Factors in section 4.1.3. To enquire about the literature about planning strategies in healthcare, we use various search terms in Scopus, Web of Science and Springer dependent on one of the four factors presented in the questionnaire. The first three terms were “(Perceived workload) AND (Relation) AND (Healthcare)”, with their respective synonyms and additionally “(Planning OR Staffing)” besides searching for general planning strategies in these same databases. Further literature used was advised from courses given in the discipline or from supervisors, such as the research (Veen, 2013), the study (Nistelrooij, 2016) and the book (Ozcan, 2017).

4.1.1 Rest and Reflection

The questionnaire confirms the need for breaks or resting moments, as seen in section 3.1.2. The need for breaks or relaxing moments and its relation to the quality of work and the mental strain of working is also confirmed in the literature. To enquire about the literature about the effect of breaks on perceived workload, we use the following search terms in Scopus and Web of Science, “(Perceived workload) AND (Rest OR Fatigue) AND (Relation) AND (Healthcare)”. Across both databases, we found a total of 25 sources. The sources were reduced to four by adding the criteria that COVID-19 specialized research was subtracted from the search. This substitution is done due to COVID-19 putting a considerable strain on the way of working, which is not as relevant to the way of working or taking breaks at the current time. Further elimination took place based on relevance to the research at hand based on the abstract.

The inclusion of breaks during sustained mental-based work has been found to have a positive impact on the quality of work produced. Research has shown that breaks are effective in preventing errors in performance and that after a period of rest, individuals can respond more quickly and accurately (Chen, Barnes, & Harper-Sciarini, 2010). Additionally, breaks provide a degree of mental rest, which can reduce mental fatigue and alleviate the strain of mental workload throughout the day. Another thing to consider is that individual differences account for the number of breaks an employee takes and, consequently, for variations in work-related fatigue and distress (Blasche & S. Pasalic, 2017). In conclusion, taking breaks reduces the mental strain of work and perceived workload.

4.1.1.1 Add breaks

Despite the benefits of breaks, the scheduling of these intervals is often overlooked by planners and healthcare professionals. Currently, the responsibility for scheduling breaks falls on healthcare professionals, which can result in work being scheduled during regular break times. This situation may occur for various reasons, such as breaks not being within contracted hours and therefore not considered in the overview or healthcare professionals failing to communicate their break times. Healthcare professionals are overlooking their breaks and choosing to work through them instead.

To address this issue, we advise adjusting the available hours in the plan overview to include a 30-minute break per work day. This break can be scheduled at two 15-minute or one 30-minute intervals, depending on the schedule. Or plan a break that holds for all healthcare professionals simultaneously, such that the time to take a break is communicated.

Another method can be using a variation of the “Days off scheduling” principle. The days off scheduling constructs a schedule that indicates each employee's working days and days off. The specific shifts performed by employees on working days are determined at a later stage. A day off schedule should satisfy labour legislation, specifying, for example, the maximum number of consecutive working days (Veen, 2013). The variation uses the breaks or break time for the days and replaces the consecutive working days with consecutive working hours. However, doing this for all 72 employees present with required breaks can be time-consuming without the proper tools.

4.1.1.2 Individual evaluation moments

The reflection moments are an improvement deemed attractive out of the questionnaire. This attractiveness aligns with the definition of mental workload, which encompasses the subject of reflection. A potential adjustment to the current planning structure could involve incorporating a fifteen-minute reflection period each day. This moment was preferred to be at the end of the day, according to the outcome of statement 7 in section 3.1.4. This initiative can match the norm of 86% for the respondents' average contracted hours, which was 28 hours. The math regarding the reflection moments for a healthcare professional working 28 will be as follows.

The number of reflection moments will be four, and the time will be narrowed to fifteen minutes. This frequency can be translated to an hour per week, $1 / 28 = 3.6\%$ of the total weekly time. This time would be taken from the 14% non-patient-bound time, encompassing all other activities, as explained in section 3.2. The reflection moments would account for 25.7% of this 14% non-patient-bound time.

In addition, if the reflective moment is taken to reflect upon a patient, a part of the contemplative moment can possibly be addressed under patient-bound time.

4.1.1.3 Interventions or awareness training

Another way to gain a moment of rest or awareness is by workers receiving treatment for absenteeism and presenteeism, for example, through workplace well-being interventions, reporting higher levels of productivity, which can lead to higher levels of job satisfaction (Carolan, Harris, & Cavanagh, 2017). Furthermore, workplace interventions that focus on self-care, worker empowerment and access to mental health services, such as mindfulness sessions or meditation, have been found to decrease levels of psychological stress, anxiety and burnout in healthcare workers (Y, E, E, Bent, & Goetzel, 2022). Healthcare workers benefit from workplace well-being interventions, with a wide array of positive

outcomes (improvements in well-being, work engagement, quality of life and mindfulness, as well as reductions in burnout, perceived stress, anxiety and depressive symptoms) reported (Cohen, Pignata, Bezak, Tie, & Childs, 2023). These interventions or awareness training are a moment to reflect upon their work and work experience. Adding these trainings to their schedule can reduce the level of mental strain of the job and potentially reduce the level of cognitive workload experience amongst the employees. These trainings show that a moment of rest in the schedule does not have to be the only solution to the problem of breaks.

4.1.2 Regulation

Another way to lessen the mental workload is clear communication and expectations, and this could be translated into clear boundaries in which the planner can control the schedule. This clarity can be achieved by implementing office hours, appointment schedules, consistent workdays, and predetermined deadlines for schedule communication. To enquire about the literature about the effect of regulation of the work environment on perceived workload, we use the following search terms in Scopus and Web of Science, “(Perceived workload) AND ((Regulation OR Systematic OR Communication) AND Work) AND (Relation) AND (Healthcare)”. Across both databases, we found a total of 25 sources. The sources were reduced to two by adding an extra criterion that COVID-19 specialized research was subtracted from the search. This subtraction is due to COVID-19 having a considerable strain on the way of working, which is not as relevant to the way of working or taking breaks at the current time. Further elimination took place based on relevance to the research at hand based on the abstract.

4.1.2.1 Office hours

The survey shows that the standard office hours, 8.00-18.00, are appreciated amongst employees. However, the working hours at Organization X are mostly catered to the patient and their guardian due to it being a healthcare institution. The healthcare professional can choose when to come into the office with a specific variability, leading to colleagues not precisely knowing when a particular person is available.

4.1.2.2 Communication

The impact of different communication methods on workload and response time has been extensively studied, as noted by Nhan Tran (2020). It has been found that employees who work under high mental workload conditions tend to have faster response rates and react more quickly when addressed straightforwardly. This finding also came forward in the open answers of the survey, stating that regarding the planning of the schedule, a lot of mail traffic is needed, which took a lot of headspace. When looking at the communication of the schedule and the time frame, the healthcare professional does experience some hindrances, with the schedule being delivered on short notice. Nevertheless, they do not explicitly express this as a cause for concern.

A solution to this issue is that the healthcare professional and other parties that try to schedule an appointment can use an internal form. The appointment can only be actively requested when all needed information is filled in. This implementation will simplify communication regarding appointment data and leave little room for errors.

4.1.2.3 Regulation of operations

The introduction of the planning system has caused a lot of confusion amongst the employees because the planning routine has been altered. Since the management of the schedules is given to someone else, the healthcare professional can experience a lack of overview due to not doing everything on their own. The relationship between self-management and perceived workload can be negative or positive based on the person you ask (Nistelrooij, 2016). A higher level of self-management can reduce the perceived workload by 1) better alignment in the team, 2) greater ability to influence own work, and 3) greater ability to react adequately and fast. However, for employees in teams with a lot of ambiguity concerning the concept of self-management and how to fill their new role, the mechanisms mentioned above are not the only mechanisms in place. For those employees, the level of self-management can lead to more perceived workload by unclear expectations, changing demands and needed effort to do more tasks simultaneously. The system change can affect the perceived workload of healthcare professionals and how they need to act in this new environment. The solution is to give the change some time to get used to a new routine.

4.1.3 Social Factors

To enquire about the literature about the effect of regulation of the work environment on perceived workload, we use the following search terms in Scopus and Web of Science, “(Perceived workload) AND ((Social Relations) OR (Productivity)) AND (Healthcare)”. Across both databases, we found a total of 77 sources. Due to the large number of hits, the sources were filtered by adding the research subject, mainly planning, healthcare and social sciences. Based on their abstract, we used one of the first hits and utilised the research one of the supervisors advised.

Research according to (Dall’Ora, Ball, Reinius, & Griffiths, 2020) identified high workload, value incongruence, low control over the job, low decision latitude, poor social climate/social support, and low rewards as predictors of burnout. Other factors classified as predictors of burnout in the nursing literature were time pressure, high job and psychological demands, common task variety, role conflict, poor supervisor/leader support, poor leadership, negative team relationships, and job insecurity. A significant part of these factors is attributed to the employees' social position, social contact and maintaining good relationships with managers and coworkers (Nistelrooij, 2016).

Employees can better deal with the increasing demands of a self-managing team when their manager provides support, where different forms of support can be appropriate in various situations. Social support from colleagues was not found to influence the relation between the level of self-management and perceived workload. Role ambiguity showed a small negative effect, implying that the perceived workload decreased to a small extent for intermediate to high levels of self-management and ambiguity (Nistelrooij, 2016).

The social factors contributing to perceived workload are catered to job definition and relation to the manager. When looking at the organizational structure of Organization X and the three self-sufficient teams they use with two managers, there are possible improvements—for example, appointing team leaders or managers, such that the team members have a closer relationship with the manager and management operations or motives. Another option is a better role definition for the employees, such that their work expectations are evident.

4.2 Actual Workload Changes

The actual or modelled workload does not precisely predict the perceived workload. However, there is a correlation between the two (Oetelaat, 2021). This section presents the changes regarding the actual workload and Work Design.

4.2.1 Work Design

This section will go into the operations management in Organization X and especially Work Design. In the following sections, we will research the definition section 4.2.1.1, the explanation of the equations section 4.2.1.2, the relevance to Organization X section 4.2.1.3 and the application to Organization X section 4.2.1.4.

4.2.1.1 Components and Definitions of Work Design

To enquire about the literature about Work Design, we use the following search terms in Scopus: “Work Design Definition and Work Design aspects”. To obtain general insight into the subject, we used the advised book (Ozcan, 2017) and its references to support our search.

Work Design is understanding the work environment and the design of the work itself (Ozcan, 2017). This description is one of the things that came forward in the survey as irregular. The Work Design is not fully defined and contributes to mental workload. Work Design assesses how tasks or a job are organized within the work environment and ensures these are well-matched to the employee attributes (Gervais, 2012). The aim of effective Work Design is that employees are satisfied, organizational productivity is high, and costs are minimal (Ozcan, 2017). Mental workload or workload, in general, can increase when the job load does not match the employee's expectations, which is not in line with the Work Design.

Work Design comprises three components: Work Measurement, Job Design, and Worker Compensation (Ozcan, 2017). These components have relations, and Work Design influences its components. Work Measurement is about how much time it takes to complete a job. Job Design is what a job entails and which responsibilities are there. An essential action in Job Design is Job Simplification. Job Simplification is about splitting tasks and keeping a job as straightforward as possible without too much variation in job content. Worker Compensation is about how to reward employees and attract productivity from employees.

4.2.1.2 Work Measurement equations

The evaluation of the Work Design came forward in the survey by being catered to the direct patient-bound time and the review of the time it takes to treat a patient. The Work Measurement component of Work Design needs to be researched to research the actual time it takes to treat patients and evaluate if the caseload fits with the standards set by Organization X. As the time planned and its reality are different. This leads to the research regarding Work Design being catered to Work Pressure and Expectations factors that come forward as causes for perceived workload in the questionnaire.

There are equations (Ozcan, 2017) related to the calculation of Work Measurement and some variable names, which are explained below:

OT = Observed Time, actual time spent on a job

ST = Standard Time, time spent on job taken into account non – perfect job execution

NT = Normal Time, time supposed to spent on a job, set by protocol

AF = Allowance Factor, factor that takes into account non – perfect job execution

PR = Performance Rating, the speed at which an employee can do the job

- PR equals 1 for the average worker, PR < 1 is for a slower worker

Observed Time: average of observed times

- $OT = \Sigma x_i / n$

Normal Time: observed time adjusted for worker performance

- $NT = OT \times PR$ (where PR = performance standard measured for the entire job)

Standard Time: normal time adjusted to non-perfect job execution

- $ST = NT \times AF$ (where AF = allowance factor set for the entire job)

Allowance Factor (AF)

- $AF_{job} = 1 + A$, where A = allowance percentage based on job time
- $AF_{day} = \frac{1}{1-A}$, where A = allowance percentage based on workday

When looking at the equations, the relation becomes clearer: there are three types of Time, namely Observed Time (real-time), Normal Time (considering worker performance), and Standard Time (considering worker does not work productively 24/7). Two components influence the time settings to be different from reality: the Performance Rating and the Allowance Factor.

4.2.1.3 *Relevance to organization*

The Work Measurement component uses time standards in Organization X, which are the treatment plans per patient. This treatment plan states the treatment period, number of appointments, and total hours. From discussions with employees and the questionnaire, it came forward that the time standard is not equivalent to the actual time spent. The stopwatch time studies (Frederick Winslow Taylor) can measure this in real time. This method was used to create time indicators on jobs done by factory workers. However, the principles of the study, namely measuring the real-time and comparing it with the standard, is an excellent method to use in this scenario for Organization X. Another would be to use the data registered in USER, the electronic patient database in which appointments are scheduled. Suppose the quality of the data is detailed enough to represent the real-time.

When these actual times have been measured, the difference with the time standard can be analysed. The Work Measurement method can be used in three ways: treatment tracks of patients, individual healthcare specialists, and the healthcare specialist of Organization X. The treatment tracks can be reevaluated as realistic based on measuring the times per diagnosis type. The individual healthcare

specialist's tasks can be measured in the time it takes to complete, not the time it is scheduled, and productivity can be re-evaluated. Organization X's total time spent on patients can be measured and compared with the total time set for treatment paths.

The time standard can be measured and reevaluated by observations, meaning the appointment times need to be measured, and the number of appointments needs to be counted. Then, when calculating this for multiple patients amongst different types of diagnosis groups, standardized trajectories and average appointment times can be communicated. These standardized trajectories can then be considered to evaluate the norm set by Organization X, see section 3.1.3. The time standard when looking at the healthcare specialists and their direct patient time can be compared to the standard of 86% and its feasibility to maintain that standard.

When the standard time and observed time are precise and collected, the performance rating and allowance factor come into play. These two factors depend on employees, how fast they can get a job done, and how much time they can spend productively. By the patient-bound time standard of 86%, the allowance factor of Organization X is 16%. The allowance factor is related to workload experience since it is the variable that indicates the time spent outside the literal job requirement, such as breathing room. So, for this research regarding the mental workload, the calculation of the real allowance factor and its preferred allowance factor is relevant.

4.2.1.4 Application

This section explains the application steps of the equations and data processing based on the equations in section 4.3.2 and the definitions 4.3.1. Denote the assumption that the norm of 86% holds for every week.

4.2.1.4.1 Observed time

One of the things that came forward from employees was that the caseload does not match reality, meaning that the time to treat a patient (NT) does not check the actual time spent on the patient (OT). This inequality can be caused by another difference in time spent by an employee:

$$OT_{XY} = \frac{NT_X}{PR_Y}$$

- Derived from the Normal Time equation
- Where X = employee , Y = patient , so XY = employee & patient
- $\sum_{Y=1}^n OT_X = 86\% \times C_x$
- $\sum_{Y=1}^n OT_X$ = sum of all observed times of all patients of employee x, i.e. the total patient bound time
- C_x = capacity of the employee in contractual hours

These equations look at one employee X treating one patient Y to determine the observed time of treatment of patient Y under employee X. The normal equation is being used. However, when applying the standard given by Organization X of having 86% patient-bound time and productivity, the second equation should hold, and the following equality should hold $OT_{XY} = \sum_{Y=1}^n OT_X$. This equality means that the sum of all individual Observed Times and appointments should equal the general Observed Time, following the Normal Time and Performance Rate. If these do not match, a difference in Performance Rating does not allow the healthcare specialist to follow the productivity norm. Suppose

this healthcare specialist experiences a high level of mental workload. In that case, this can be why the performance rating is not up to standard with the productivity norm of Organization X.

We can also reevaluate the productivity norm of 86%. The Observed Times can be calculated for all healthcare specialists and, with that, the Performance Rating. If the performance ratings are within a specific acceptable range, then the question arises of whether the 86% is realistic. If the equality $OT_{XY} = \sum_{x=1}^n OT_x$ It does not hold for the majority of the employees. The productivity norm is not valid. With the equality $OT_{average} = \frac{1}{n} \sum_{z=1}^n OT_z$, where z is the observed time of individual employee x, we can calculate the new norm.

4.2.1.4.2 Allowance factor

One of the things that came forward from employees was that the caseload did not fit with the real-time, causing the feeling of never slowing down with work. Using the equations means that the time to treat a patient (NT) does not match the standard time spent on the patient (ST). This feeling of never slowing down on work is caused by the allowance of not spending all contracted hours on patients (AF) being too low.

- $ST = NT \times AF$
 - o (where AF = allowance factor set for the entire job)
- $AF_{job} = 1 + A$, where A= allowance percentage based on job time
- $AF_x = \frac{\sum_{x=1}^n OT_x}{C_x}$

The Allowance Factor is influenceable; when using the set norm of Organization X of 86% direct patient-bound time, the allowance factor is 16%, meaning that 16% of the contracted hours do not need to be spent on direct patient-bound time, “the job”. The typical Allowance Factor is hard to determine since the prime strain of the job is mental intensity, which is difficult to measure. As mapped by (BW Niebel 1988), the typical allowance levels are based on jobs that can be observed, so where the physical or mental strain is easily visible and measurable.

This shortcoming leads to the idea that Organization X should try and reevaluate their AF based on their own Time Measurement. This factor can be found by setting a general AF for all healthcare specialists using the Observed Times form section 4.3.4.1 to calculate the new norm.

By using this new norm in the equation $AF_{average} = \frac{\frac{1}{n} \sum_{z=1}^n OT_z}{C_x}$

The general Allowance Factor can be computed. However, since the Allowance Factor is subjective to the job, there can also be an individual approach to calculating the Allowance Factor of every individual healthcare specialist. The individual Allowance Factors can show the distribution of these factors. Compared to interviews regarding mental workload, the Allowance Factor can be tested as an apparent cause of this experience. Another interesting approach to the Allowance Factor considers the teams or the specializations of the healthcare specialists and compares the Allowance Factor of the teams or disciplines with each other. From this comparison, the intensity of the job experience can be presented.

4.3 Conclusion

In this chapter, we will compare the mental workload opinions defined by Organization X and possible planning additions to determine the best fit for Organization X. This analysis will address the question, “*What are possible changes related to the planning system that can improve the mental workload?*”.

The needed changes are complex to indicate; however, there are two paths in which they can take place: the one catered to the perceived workload and the one to the actual workload. The perceived workload contains three subjects: rest and reflection, regulation and social factors. These subjects are catered to the perceived workload factors that came forward during the questionnaire: Expectations, Work Pressure, Personal Contacts and Reflection. The workload has one path catered to factors, Expectations and Work Pressure, by researching Work Design.

The improvements regarding the perceived workload mainly were catered to the planning system’s operational side. For example, how to actively let the employees take their assigned breaks. The effectiveness of these improvements relies heavily on the individual's work ethic. This reliance is confirmed by the literature as well as the answers to the questionnaire. The possible improvements in the questionnaire were answered with large deviations, meaning that the general answer is not coherent. Even so, the reaction to the improvements can positively influence the perceived workload and work pressure.

The second path is the actual workload path based on reevaluating the work done, which will be done under the subject of Work Design. To better understand the topic, a literature search was conducted regarding its definitions, components, and possible relations to mental workload, which can be of significant value. The conversations with personnel and the questionnaire both gave the impression that the time scheduled for treating a patient across the entirety of the treatment plan is often not as high as the reality of time spent on the patient. To reevaluate this norm and test if this is the case, Work Measurement is needed, which can be done following the application of section 4.2.1.4. This process can be time-consuming for Organization X but is an improvement with a significant impact on the stabilization of workload and testing the feasibility of the norm if the actual workload and its standard are indeed the cause of the perceived workload amongst employees of Organization X.

5 Conclusion

This chapter will provide the research results and answer the research aim *"To find possible planning improvements based on healthcare professionals' experiences/preferences, to stabilize the workload experience in the new planning system."*. The answer will be presented by answering the research questions in section 5.1; after these have been answered, the conclusion and final answer will be given in section 5.2. How Organization X can use these answers is presented in section 5.3. The shortcomings of this research and these conclusions can be found in section 5.4.

5.1 Research Questions

In this section, the results of the research questions will be discussed.

1. *How does the planning system operate, and what are the shortages according to employees?*

The planning system uses a plan overview per healthcare professional and appointment requests. The booking office schedules these two, and the planner tests the feasibility of these bookings. The allocated time in the schedule is usually utilized to its maximum capacity, resulting in appointments being frequently scheduled simultaneously. The scheduling of appointments often takes longer because of the variability in schedules and gathering the missing information needed to fill in the appointment request. The inefficient scheduling process leads healthcare professionals not to follow the assigned channels and schedule appointments.

2. *How do employees rate their workload experience?*

a. *What causes the workload experience of employees?*

The workload referenced in this research is better known as the mental workload or cognitive workload. This workload is catered to express the mental capacity occupied by the employee for conducting their work. For this research, the following aspects are tested in a survey: Fatigue, Satisfaction, Stress and work pressure, Overview, Expectations, Reflection, Personal contact, Communication, and Overworking. The factors from the questionnaire related to the mental workload were Expectations, Work Pressure, Personal Contact, and Reflection.

The general impression of the mental workload amongst healthcare professionals is that taking over planning and scheduling is a good step in unburdening them. Within this schedule, there are no significant preferences on a macro level. However, on a micro level, there is a lack of time for breaks, finishing their jobs, and feelings regarding personal contact with colleagues. Next, the scheduling may not be the only cause of the current mental workload and work pressure experienced by the healthcare professional. Still, it can also increase the complexity of the patients needing treatment.

b. *What is the desired rate of the management?*

Management wants to create clarity in the schedule of healthcare professionals and stabilize their workload by taking over their planning responsibilities and increasing their overall efficiency and time spent on direct patient contact. Their schedules are still fluctuating outside the 70% - 100%. The norm is to create an 86% to 14% natural and indirect patient time division.

3. *What are possible changes related to the planning system that can improve the mental workload?*

The needed changes are complex to indicate; however, there are two paths in which they can take place: the one catered to the perceived workload and the one to the actual workload. The perceived workload contains three subjects: Rest and Reflection, Regulation and Social Factors. These subjects are catered to the perceived workload factors that came forward during the questionnaire: Expectations, Work Pressure, Personal Contacts and Reflection. The workload has one path catered to factors, Expectations and Work Pressure, by researching Work Design. Possible changes include set reflection moments or stress awareness workshops, appointment application forms or office hours and revaluation of the Allowance Factor.

5.2 Research Aim

The answers to the other research questions imply that operationalizing mental workload is more challenging than it looks and is often a multidimensional variable, meaning that no one cause influences it and is subjective to a person. However, the aim of this research is:

"To find possible planning improvements based on healthcare professionals' experiences/preferences, to stabilize the workload experience in the new planning system."

To improve and stabilize the workload, research has been conducted using literature studies and tested amongst employees of the organization. The main findings in employee experience were a lack of breaks and individual moments throughout the week. The caseload and Work Design are not equal to the productivity expectation of the organization. When researching possible solutions for planning alterations to help stabilise the workload, and therefore a part of its experience, the findings were that the organization and its advisors were already incorporating many of these improvements.

However, literature searches were conducted to find alternative improvements that Organization X. Multiple solutions that have not been incorporated have been found. There are two angles to take when looking at improvements: those that affect the perceived workload and those that cause the actual workload. The perceived workload is catered to solve factors such as Expectations, Work Pressure, Personal Contact, and Reflection. This search was done by looking at Rest, Work Regulations and Social Factors. The actual workload resulted in an improvement regarding testing the feasibility of the set norm of Organization X regarding the employees' productivity. This improvement is catered to Work Design to cover the factors of Expectations and Work Pressure, as when a standard is not feasible, an increase in work pressure is expected.

In conclusion, improvements can be made to stabilize the workload experience in the new planning system. However, the research also confirms that workload experience and its attributes largely depend on individual work ethics and preferences. This dependency leads to uncertainty regarding the improvements and their definite effects on the workload experience. Therefore, the research did not improve the new planning system by lowering the workload experience as proposed in the research aim. Despite these findings, the results are still of value for the literature and organizations since they provide a list of factors related to workload experience amongst employees of Organization X and different options or directions to influence these factors.

5.3 Recommendation

The research concludes that there are no clear improvement paths to take when aiming to stabilize the workload experience of employees in a planning system. Therefore, multiple tracks can be taken to find a stabilizer effectively using all possible improvements seen in the research.

Section 4.1.2.3 describes the change in the self-management role of the healthcare professionals and their planning and scheduling activities having a positive or negative effect on the perceived workload. The positive side is that the responsibility regarding the schedule is now done by another person, saving the healthcare professional time and mind space due to just being able to follow a pre-set schedule. The negative side is not exactly knowing when or where to be, insinuating a lack of control and overview. The negative relation is mainly caused by the integration of a new way of working and its lack of the employees' trust as being functional. When the system is fully integrated and has chances to improve, the confidence in the system will grow, and the uncertainty of the healthcare professional regarding the schedule will decrease. This increase in certainty can lower the perceived workload on its own.

If this is not the case, the system needs a reevaluation or additional actions can be taken. For further actions, the alternatives discussed in section 4.1 are possible options for Organization X. For the system reevaluation, the healthcare professionals reflect on the experience of using the system. This evaluation can be done using Force Field Analysis, derived from the work of (Luwin, 1951). Force field analysis is a technique for evaluating the various forces for and against a proposed change. It can decide if a proposed change can be successfully implemented. Alternatively, if a decision to change has already been made, force field analysis can be used to develop strategies to implement the change successfully (McLaughlin & Hayes, 2008).

This analysis can be done in a group or individual session, and it is advised to start with the people in the system the longest. The reflection is catered to the experience of the change in the system and how it influenced the perceived workload. When the process is described as being stressful and time-consuming in the beginning and leading to less occupation of the mind due to having one task less, the progress is there, and the relation is positive. We can conclude that the planning system does its purpose in unburdening healthcare professionals in Organization X.

If the general answer is still the same as before the integration of the new system, the same conclusions can be made as in section 3.1. The planning norms and standards should change if the main answer is still that the caseload and Work Design are not equal to the productivity expectation of the organization. The norm should be reevaluated using the process described in section 4.2.1.4. This can be done using historical data when accurate enough or by measuring current situations.

We advise starting with a small sample set of healthcare professionals to cater to this. The preference is team 3 since they have been using the new system. The data should contain:

- Pre-set treatment plans of the patients entering the system, to give as standard time (NT)
 - o This should include the number of hours, appointments and when the patient is dismissed out of the system
- An actual treatment period of the patients entering the system, to give as observed time (OT)
 - o This data should contain the number of hours, appointments, possible new diagnoses, entering another treatment plan and the patient being dismissed from the system.

- If this data is unavailable out of USER, this data should be measured.
- Performance Ratings of the healthcare professionals need to be set
 - The assumption of all being equal to one can be made

As presented in section 4.2.1.4, the calculation process can be executed when this data is present. This calculation will lead to an allowance factor of team 3, which is open for comparison to the allowance factor set by Organization X. If these do not line, the norm needs to be evaluated, the Observed Times need to be less variable, or the Performance Ratings of employees need to be higher.

Another approach can be looking at other healthcare institutions struggling with the same issue, like the research (Huggins & Claudio, 2019). Considering the mental workload, this study focused on increasing productivity and efficiency in a Cancer Clinic (CC). The demand for the clinic has increased, and the clinic has recognized the importance of improving the distribution of resources. This research measured mental workload and physiological responses using a perceptual tool, NASA-TLX. The purpose was to balance patient appointments and increase resource utilization while considering the balance of human workload as a constraint in the mathematical model. (Huggins & Claudio, 2019). The NASA-TLX tool was used to evaluate the intensity of tasks and the response time of the nurses, using work sampling and data regarding patient time in the system and frequency of arrival. If possible, this method needs to be catered to the work done at Organization X. NASA-TLX also tracks physical attributes such as skin temperature, heart rate, and time. The disclaimer to this research is that it uses a mathematical model while most of the scheduling in Organization X is done manually.

5.4 Discussion

When conducting any research, it is essential to acknowledge that it is never perfect. It is crucial to reflect on the study to identify the aspects lacking quality. In this section, these factors are discussed. The research presented in this thesis is subject to several limitations, most of which are centred around the limited timeframe and inexperience of the researcher.

The first limitation is that the research is conducted in a changing environment at the organization. While conducting the research, the planning system was incorporated and innovated simultaneously. This innovation means that the system's function at the start of the study cannot be taken as the exact functioning of the system at the end. For example, changes regarding the system's communication channels were made during the start of the research. Next, the questionnaire was distributed amongst all healthcare personnel at Organization X, but only team 3 was working on the new system at the time of research. This generalization alters the data since there was no distinguishing between the teams. We do not know the general opinion of the team regarding perceived workload. In general, the research regarding the functioning of a changing system will lead to a time-lapse.

Secondly, there was a high spread of answers to the questionnaire's statements. The low response rate mainly causes these but is also partially due to the formulation of the statements. The questionnaire was made based on a short search of information and a first-time use of this data-gathering method. This short-sidedness can lead to participants not understanding the statement or having too few answer options to provide the correct answer. The questionnaire method was an excellent alternative to gather insight into personnel's opinions; however, the process must be used more concisely to get specific insight.

A third limitation is the missed opportunity to test the advised improvements and validate their effectiveness. For example, try to see if the theory explained in section 4.2 is fundamental and if the norm set by Organization X is not feasible to maintain when measuring the actual time spent on patients. However, this also depends on the quality of data Organization X has regarding the subject. There are options to gain this data if Organization X invests more time in testing the theory.

Lastly, the limited data availability also limited the possibility of finding the cause of the workload experience. The research regarding the operationalization of the mental workload was also minimal, leading to the researcher's operationalisation of the variable based on what was found and tested in the questionnaire. The cognitive workload being subjective to the person was hard to grasp, and the high variability in the working methods of personnel at Organization X did not make generalizing this easier.

These limitations did affect the research, however the research still contributes to science by conducting a search in the literature gap on optimizing psychiatric institutions and understanding the workload experienced by personnel within these institutions. The research confirms that workload experience and its attributes largely depend on individual work ethics and preferences. This dependency leads to uncertainty regarding the improvements and their definite effects on the workload experience. Despite these findings, the results are still of value for the literature and organizations since they provide a list of factors related to workload experience amongst employees of Organization X and different options or directions to influence these factors.

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6 Appendix

Questionnaire

Below, the questionnaire is spread amongst Organization X.

Introductie

Beste deelnemer,

Bedankt voor jouw interesse om deel te nemen aan deze vragenlijst.

Het onderzoek richt zich op de werkdruk-beleving binnen Karakter en wat de oorzaken zijn van deze ervaring. Om dit te achterhalen worden er vragen gesteld over tijdsdruk, tijdsbeleving, werktijden, en voorkeuren t.a.v. de planning, tot slot is er de mogelijkheid om verdere toelichting te geven.

Deze vragenlijst dient in de eerste plaats voor onze bachelor afstudeeronderzoeken. Daarnaast kunnen de onderzoeksgegevens gebruikt worden voor wetenschappelijke en/of praktijkpublicaties, waarbij anonimiteit uiteraard gewaarborgd is.

Dit onderzoek is beoordeeld en goedgekeurd door de ethische commissie van de faculteit BMS van de Universiteit Twente. Het invullen van de vragenlijst duurt ongeveer 20 minuten. Wanneer het niet lukt om de vragenlijst in één keer in te vullen, dan kun je op een later moment verder gaan waar je gebleven was door de link uit de email te gebruiken.

Wij doen er alles aan om jouw privacy zo goed mogelijk te beschermen. Er wordt op geen enkele wijze vertrouwelijke informatie of persoonsgegevens van of over jou naar buiten gebracht. De data die in het kader van deze studie worden verzameld, worden zoveel mogelijk geanonimiseerd opgeslagen. Onderzoeksgegevens zullen dus niet herleidbaar zijn naar een deelnemer.

Deelname aan dit onderzoek is geheel vrijwillig. Je kunt als deelnemer jouw medewerking te allen tijde stoppen, zonder opgaaf van redenen en het heeft geen nadelige gevolgen voor jou. Als je tijdens het onderzoek besluit om jouw medewerking te staken, zullen de gegevens die je al hebt verstrekt in het onderzoek gebruikt worden. Als je niet wilt dat jouw gegevens gebruikt worden, moet je kunnen aangeven wat jouw exacte antwoorden zijn om te herleiden welke vragenlijst van jou is, om de gegevens te verwijderen.

Wil je stoppen met het onderzoek, of heb je vragen en/of klachten? Neem dan contact op met de onderzoeksleider:

dr. Mireille Post-Hubers, Universiteit Twente

m.d.hubers@utwente.nl

+31 53 489 1115

Voor bezwaren met betrekking tot de opzet en/of uitvoering van het onderzoek kan je je ook wenden tot de Secretaris van de Ethische Commissie van de faculteit Behavioural, Management and Social Sciences op de Universiteit Twente via ethicscommittee-bms@utwente.nl.

Basis informatie

1. Ik ben werkzaam op locatie Poli Zwolle:
 - a. Ja
 - b. Nee
2. Ik ben werkzaam in team:
 - a. – Open –
3. Ik ben werkzaam in functie(s):
 - a. -Open-
4. Ik werk contractueel ... uur per week:
 - a. – Open –

Vragen omtrent stress/tijdsdruk

1. Ik werk regelmatig onder tijdsdruk
 - a. Nooit
 - b. Zelden
 - c. Regelmatig
 - d. Vaak
 - e. Altijd
2. Ik heb te weinig tijd om mijn werk af te krijgen
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
3. Mijn dagen zijn vaak te vol gepland
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
4. Ik werk vaak over
 - a. Meer dan 2 dagen per week
 - b. 2 dagen per week
 - c. 1 dag per week
 - d. 1 dag per maand
 - e. Minder dan 1 dag per maand
5. Ik werk over op de volgende momenten:
 - a. Buiten kantoortijd, buiten 8.00-18.00
 - b. Doordeweekse dag die ik normaal vrij heb
 - c. Ik werk in het weekend

6. Ik ontspan niet op mijn werk
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens

Vragen omtrent tijdsbesteding/ inzicht werkzaamheden

1. Ik heb weinig inzicht op hoe druk ik ben
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
2. Ik raak vaak in paniek na het zien van mijn agenda voor de komende dag
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
3. Ik haal structuur uit de opbouw van mijn werkweken / werkdagen
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
4. Ik heb een vast ritme op (vrijwel) al mijn werkweken
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
5. Ik heb genoeg tijd in de week op actief te reflecteren op mijn werkzaamheden
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens

6. Als een afspraak verzet wordt kan ik dit opvangen met andere werkzaamheden
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
7. Er is genoeg flexibiliteit in mijn agenda om crisis zorg te verlenen
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
8. Ik heb genoeg tijd in de week om iedere dag mijn aangewezen pauzes ook te houden
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
9. Ik neem vaak extra werk op me terwijl dit niet past in mijn (lange termijn) planning
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
10. Ik ga akkoord met afspraken die niet relevant zijn voor mijn takenpakket
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
11. De hoeveelheid patiënten die ik heb in mijn caseload is passend
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
12. De hoeveelheid tijd die ik nodig heb per patiënt is vaak precies de geplande tijd
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
13. De hoeveelheid tijd die ik besteed aan het behandelen van patiënten is 100% van mijn werkuren. Er is geen ruimte voor taken ernaast
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
14. Ik besteed veel tijd aan het inzichtelijk krijgen van mijn werkzaamheden
 - a. Minder dan 30 min per week
 - b. Minder dan 60 min per week
 - c. Minder dan 90 min per week
 - d. Minder dan 120 min per week
 - e. Meer dan 120 min per week
15. De tijd die ik neem om inzicht te krijgen in mijn werkzaamheden veroorzaakt stress
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
16. Ik weet goed hoe mijn agenda eruit ziet voor de komende ...
 - a. Meer dan 2 maanden
 - b. 2 maanden
 - c. 4 weken
 - d. 2 weken
 - e. Minder dan 2 weken
17. De termijn waarop mijn agenda inzichtelijk is, voelt ruim van tevoren
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens

Vragen omtrent persoonlijke ervaring

1. Ik ga tevreden naar huis na een werkdag
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
2. Ik ben thuis zonder na te denken over werk
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
3. Ik heb moeite met naar huis gaan omdat mijn werk nog niet af is
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
4. Ik kom vaak moe thuis na mijn werkdag
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
5. Ik kan werk en privé goed uit elkaar houden
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
6. Ik ben naar een andere baan gaan kijken door de druk die ik ervaar op mijn werk
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens

Vragen omtrent de persoonlijke planningsvoorkeuren

1. Ik heb genoeg tijd om betrokken te zijn bij mijn collega's
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
2. Ik wil graag een vaste structuur in mijn dag indeling
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
3. Ik wil graag vaste kantooruren van 8.00-18.00
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
4. Ik wil graag vaste afsprakenblokken hebben waar binnen mijn patiënten afspraken gepland kunnen worden
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
5. Ik wil graag een moment aan het begin van mijn dag om op te starten
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens
6. Ik wil graag een moment aan het eind van de mijn dag om te reflecteren
 - a. Helemaal eens
 - b. Eens
 - c. Neutraal
 - d. Oneens
 - e. Helemaal oneens

7. Hoeveel minuten wil je om je dag op te starten?
 - a. -Open-
8. Hoeveel minuten wil je om op je dag te reflecteren?
 - a. -Open-
9. Welke afspraken wil je het liefst niet opeenvolgend hebben op een dag? En waarom
 - a. -Open-

Ik ervaar veel werkdruk door:

-Open-

Hoe kan de organisatie daar iets aan doen:

-Open-

Zijn er nog aspecten omtrent de planning van je agenda die leiden tot werkdruk ervaring:

-Open-

Extra toelichting

Verdere toelichtingen omtrent werkdrukervaring naar aanleiding van de vragenlijst kunt u hieronder delen. Voor eventuele vragen kunt u contact opnemen via b.tienstra@karakter.com.

DANK VOOR UW BIJDRAGE!